

**California Department of Education Assessment Development & Administration Division**



# California Assessment of Student Performance and Progress California Alternate Assessments for English Language Arts/Literacy and Mathematics 2020–‍2021 Technical Report

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**By ETS**



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Acronyms and Initialisms Used in the California Alternate Assessments for English Language Arts/Literacy and Mathematics Technical Report

| **Term** | **Definition** |
| --- | --- |
| 1PL | one-parameter logistic |
| 1PL-IRT | one-parameter logistic item response theory |
| AERA | American Educational Research Association |
| AIS | average item score |
| ALD | achievement level descriptor |
| ALTRD | Assessment and Learning Technology Research & Development |
| APA | American Psychological Association |
| CAA | California Alternate Assessment |
| CAASPP | California Assessment of Student Performance and Progress |
| CAI | Cambium Assessment, Inc. |
| CALPADS | California Longitudinal Pupil Achievement Data System |
| CalTAC | California Technical Assistance Center |
| CA NGSS | California Next Generation Science Standards |
| CAST | California Science Test |
| *CCR* | *California Code of Regulations* |
| CCSS | Common Core State Standards |
| CDE | California Department of Education |
| CDS | county/district/school |
| CERS | California Educator Reporting System |
| CORR | correlation |
| COVID-19 | novel coronavirus disease 2019 |
| CR | constructed response |
| CSEM | conditional standard error of measurement |
| *DFA* | *Directions for Administration* |
| DIF | differential item functioning |
| DQS | Data Quality Services |
| *EC* | *Education Code* |
| EL | English learner |
| ELA | English language arts/literacy |
| ELD | English Language Development |
| ELPAC | English Language Proficiency Assessments for California |
| eSKM | Enterprise Score Key Management |
| EU | essential understanding |
| GPCM | general partial credit model |
| HOSS | highest obtainable scale score |
| IDEA | Individuals with Disabilities Education Act |
| IEP | individualized education program |
| IRT | item response theory |

Table of Acronyms and Initialisms *(continuation)*

| **Term** | **Definition** |
| --- | --- |
| ISAAP | Individual Student Assessment Accessibility Profile |
| JAWS | Job Access With Speech |
| LEA | local educational agency |
| LOSS | lowest obtainable scale score |
| LPF | Learning Progression Framework |
| MC | multiple choice |
| MH | Mantel-Haenszel |
| MST | multistage test |
| NCME | National Council on Measurement in Education |
| NCSC | National Center and State Collaborative |
| OIB | ordered item booklet |
| OTI | Office of Testing Integrity |
| PCM | partial credit model |
| PIA | preliminary item analysis |
| PLD | performance level descriptor |
| QA | quality assurance |
| RSD | ratio of standard deviations |
| SBE | State Board of Education |
| SCOE | Sacramento County Office of Education |
| SD | standard deviation |
| SEM | standard error of measurement |
| SFTP | secure file transfer protocol |
| SMD | standardized mean difference |
| SR | selected response |
| SRC | Student Response Check |
| SSC | Survey of Student Characteristics |
| SSID | Statewide Student Identifier |
| SSPI | State Superintendent of Public Instruction |
| SSR | Student Score Report |
| STAIRS | Security and Test Administration Incident Reporting System |
| TAG | Technical Advisory Group |
| TCC | test characteristic curve |
| TDS | test delivery system |
| TEI | technology-enhanced item |
| TIF | test information function |
| TOMS | Test Operations Management System |
| UAT | user acceptance testing |
| *USC* | *United States Code* |

## Introduction

This chapter provides an overview of the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics program, including background information, the purpose of the test, the intended population, and organizations and systems involved. Additionally, this chapter provides a summary of the impact of the novel coronavirus disease 2019 (COVID-19) pandemic on CAA administration (refer to section [*1.8 Impact of the Novel Coronavirus Disease 2019 Pandemic on Reporting*](#_Impact_of_the)).

### Background

In October 2013, Assembly Bill 484 established the California Assessment of Student Performance and Progress (CAASPP) as the new student assessment system that replaced the Standardized Testing and Reporting program. The primary purpose of the CAASPP System of assessments is to assist teachers, administrators, and students and their parents/‌guardians by promoting high-quality teaching and learning through the use of a variety of item types and assessment approaches. These tests provide the foundation for the state’s school accountability system.

The computer-based CAAs for ELA and mathematics were administered operationally during the 2020–2021 CAASPP administration. The CAA is for students whose individualized education program (IEP) teams have determined that a student should take the CAA (California Department of Education [CDE], 2021a). (Refer to the test-taking criteria in section *[2.4 Test-Taking Rates](#_Test-Taking_Rates)* for more information.) Note that this technical report focuses on CAAs for ELA and mathematics and *not* the CAA for Science, which is reported upon separately.

During the 2020–2021 administration, the CAASPP System comprised the following assessments:

* Smarter Balanced assessments and tools:
* Summative Assessments—Computer-based assessments for ELA and mathematics in grades three through eight and grade eleven
* Interim Assessments—Optional resources developed for grades three through eight and grade eleven designed to inform and promote teaching and learning by providing information that can be used to monitor student progress toward mastery of the Common Core State Standards (CCSS) that may be administered to students at any grade level
* Tools for Teachers—Professional development materials and instructional resources designed to help teachers use formative assessment processes for improved teaching and learning in all grades
* CAAs for ELA and mathematics in grades three through eight and grade eleven
* Science assessments in grades five and eight and high school (grade ten, eleven, or twelve; these are the California Science Test [CAST] and the CAA for Science)
* The California Spanish Assessment, optional for eligible students in grades three through eight and high school and designed to measure a student’s Spanish competency in reading, writing mechanics, and listening, as well as a high school measure suitable to be used in part for the California Seal of Biliteracy

More background information about the CAASPP System can be found on the CAASPP Description – *CalEdFacts* web page at on the CDE website.

### Test Purpose

The purpose of the CAAs is to measure what eligible students know and can do. These measures help identify and address gaps in knowledge or skills (CDE, 2021b). The CAAs for ELA and mathematics are aligned with alternate achievement standards—called the Core Content Connectors (Connectors)—that are linked to the CCSS. A Connector is a representation of the essential “core” content of a standard in the CCSS. Each content standard is assessed through the Connectors and related essential understandings (EUs). Each EU defines a basic, foundational key idea or concept based on the Connector that builds increasing understanding of the grade-level content under a three-tier structure of item complexity.

Connectors address knowledge and skills that are appropriate and challenging for the student. The student who is eligible for the CAA is learning content, linked to (and derived from) the CCSS, that appropriately breaks the standards into smaller steps.

### Test Content and Design

The CAAs for ELA and mathematics are administered to eligible students in grades three through eight and grade eleven. These CAAs are computer-based and delivered through two-stage adaptive multistage testing (MST). A student’s final score is calculated by combining the student’s performance on items from both stages.

Under the MST design used for the CAAs for ELA and mathematics, sets of items or modules with varying difficulty or complexity levels are presented to match the ability of each student according to the student’s performance on the previous set of test items. The primary advantage of the MST over the conventional fixed-form tests is its efficiency—MST is more efficient because it uses fewer test items to achieve more precise measurement of students’ performance. In addition, by providing an ability-appropriate test, MST also encourages a student’s engagement during testing, particularly for students with significant cognitive disabilities. These students represent a population with a large range of challenges and ability levels that cannot be effectively targeted by conventional fixed-form tests.

### Intended Population

At each grade level, the CAAs for ELA and mathematics were expected to be administered to approximately 5,000 students during the 2020–2021 CAASPP administration. All students enrolled in grades three through eight and grade eleven whose IEP designates the use of alternate assessments are required to take part in the CAAs (*California Code of Regulations*, Title 5 [5*CCR*]Education, Division 1, Chapter 2, Subchapter 3.75, Article 2, Section 851.5[c]).

For students with significant cognitive disabilities, the decision whether to administer the Smarter Balanced Summative Assessments or CAAs is made by their IEP team. Parents/Guardians may submit a written request to have their child opted out from taking any or all parts of the Smarter Balanced Summative Assessments or, as designated, the CAAs. Only students whose parents/guardians submit a written request may opt out of taking the tests (*Education Code [EC]* Section 60615). Additionally, students who were not tested because of a medical emergency are also exempt.

English learner (EL) students identified with significant cognitive disabilities and who are in their first 12 months of attending school in the United States are exempt from taking the ELA portion of the assessment. EL students are defined as follows:

“English learner students are those students for whom there is a report of a primary language other than English on the state-approved Home Language Survey **and** who, on the basis of the state approved oral language (grades kindergarten through twelve) assessment procedures and literacy (grades three through twelve only), have been determined to lack the clearly defined English language skills of listening comprehension, speaking, reading, and writing necessary to succeed in the school’s regular instructional programs.”0F[[1]](#footnote-2)

EL students within their first 12 months of enrollment in a US school may also take the ELA assessment if their parents/guardians elect for them to do so. These test takers are included in the calculation of the percent of students tested, but their scores are excluded from all aggregated calculations.

### Intended Use and Purpose of Test Scores

The results of tests within the CAASPP System, including the CAAs for ELA and mathematics, are used for two primary purposes, as described in *EC* sections 60602.5(a) and (a)(4). (This was excerpted from the *EC* Section 60602 web page.)

“60602.5(a) It is the intent of the Legislature in enacting this chapter to provide a system of assessments of pupils that has the primary purposes of assisting teachers, administrators, and pupils and their parents; improving teaching and learning; and promoting high-quality teaching and learning using a variety of assessment approaches and item types. The assessments, where applicable and valid, will produce scores that can be aggregated and disaggregated for the purpose of holding schools and local educational agencies accountable for the achievement of all their pupils in learning the California academic content standards.”

“60602.5(a)(4) Provide information to pupils, parents and guardians, teachers, schools, and local educational agencies on a timely basis so that the information can be used to further the development of the pupil and to improve the educational program.”

In other words, results for tests within the CAASPP System are used for two primary purposes:

1. To communicate students’ progress in achieving the state’s academic standards to students, parents/guardians, and teachers
2. To inform decisions that teachers and administrators make about improving the educational program

Sections 60602.5(c) and (d) provide additional information regarding use and purpose of test scores for the system of assessments:

“60602.5(c) It is the intent of the Legislature that parents, classroom teachers, other educators, pupil representatives, institutions of higher education, business community members, and the public be involved, in an active and ongoing basis, in the design and implementation of the statewide pupil assessment system and the development of assessment instruments.”

“60602.5(d) It is the intent of the Legislature, insofar as is practically feasible and following the completion of annual testing, that the content, test structure, and test items in the assessments that are part of the statewide pupil assessment system become open and transparent to teachers, parents, and pupils, to assist stakeholders in working together to demonstrate improvement in pupil academic achievement. A planned change in annual test content, format, or design should be made available to educators and the public well before the beginning of the school year in which the change will be implemented.”

### Testing Window

The CAAs for ELA and mathematics for grades three through eight and grade eleven were originally intended to be administered in computer-based format within a testing window selected by the local educational agency (LEA) pursuant to 5 *CCR,* sections 855(a)(1), 855(a)(2), 855(b), and 855(c). For the 2020–2021 CAASPP administration, the state testing window opened on January 12 and ended on July 30, 2021. The July 30, 2021, date was an approved extension to the legislated testing window and offered LEAs more flexibility in testing, allowing schools more time for students to test.

Like other CAASPP assessments, the CAAs for ELA and mathematics were untimed for test takers. This assessment was administered individually, and testing time varied from one student to another, on the basis of factors such as the student’s response time and attention span. A student might be tested with the CAAs for ELA and mathematics within the LEA’s testing window over as many days as required to meet a student’s needs (5 *CCR,* Section 855[a][3]).

### Significant Developments for the CAAs for ELA and Mathematics 2020–2021 Administration

#### Accessibility Resources

The following accessibility resource–related updates were made:

* CAASPP Matrix One was combined with the English Language Proficiency Assessments for California Matrix Four to create the California Assessment Accessibility Resources Matrix that serves both testing programs.
* A break was considered both an embedded and a non-embedded universal tool.
* The multiplication table accessibility resource was expanded to be a 12 × 12 table.
* The description of the scratch paper resource indicated that students may create graphic organizers.

#### California Educator Reporting System

As of January 2021, the California Educator Reporting System (CERS) replaced the Online Reporting System.

#### Transition to Preequating

In spring 2019, ETS proposed an approach to the CAASPP Technical Advisory Group (TAG) to transition the CAAs for ELA and mathematics from a postequating design to a preequated design for the 2020–2021 test administration. TAG members shared concerns similar to ETS’ regarding the potential misestimation of item response theory (IRT) parameters because of the restriction of range associated with the decision to launch the operational assessment as an MST. The decision to launch the MST during the first operational year was intended to provide the most appropriate test-taker experience for the students taking this assessment.

For the 2019–‍2020 administration, ETS reused test forms from the 2018–‍2019 administration of the CAAs for ELA and mathematics as part of a larger effort to support the transition of these assessments to a preequated design by the 2020–2021 test administration. In 2019–2020, ETS used the same operational items for each test form in the Stage 1 router and Stage 2 modules but replaced the field test items that appeared in Stage 1.

One implication of this approach meant that newly developed items were administered as operational items in second-stage modules. In many instances, these items were not administered to the full range of abilities that characterize the students eligible to take the CAAs. This lack of student representation impacted the generalizability of the estimated parameter for the full population of students taking the CAAs. The impacted items—those whose parameters were estimated at Stage 2—were readministered through the embedded field test slots. The goal of using the embedded field test slots was to expose the newly developed items to a sample representative of the test population, contributing to the estimation of the parameters.

#### Reuse of Operational Test Forms from the 2018–2019 Administration

The COVID-19 pandemic significantly impacted the 2019–‍2020 administration of the CAAs for ELA and mathematics, as the testing window’s suspension on March 18, 2020, occurred before a vast majority of students were scheduled to test during the administration.

Conducting psychometric analyses based on such a small sample increases the likelihood of producing potentially biased results. Therefore, no psychometric analyses were conducted based on students tested during the 2019–2020 administration and no item analyses of the field test items on the 2019–2020 forms were conducted, impeding the effort to transition these assessments to a preequated design by the 2020–2021 administration.

Consequently, for the 2020–2021 administration, ETS once again reused the operational test forms from the 2018–2019 administration of the CAAs for ELA and mathematics as part of the larger effort to support the transition of these assessments to a preequated design by the 2021–2022 test administration. With the exception of one field test item in a CAA for mathematics form in grade eleven, ETS used the same operational items for each test form in the Stage 1 router and Stage 2 modules and reused the field test items appearing in Stage 1 of the 2019–2020 forms.

### Impact of the Novel Coronavirus Disease 2019 Pandemic on Reporting

Similar to the 2019–2020 administration, the COVID-19 pandemic significantly impacted the 2020–2021 administration. Although the testing window was not negatively impacted by the pandemic, a large proportion of students were not offered an in-person administration of any assessment in the CAASPP System, including the CAAs for ELA and mathematics. Unlike other assessments, such as the Smarter Balanced assessments and the CAST, the CAAs for ELA and mathematics require an in-person administration and so were impacted more when schools did not offer in-person testing.

As shown in table 1.1, between 29 and 39 percent of students enrolled per content area and grade level were tested during the 2020–‍2021 administration. The number of students tested per content area and grade level was not large enough to avoid an elevated risk of producing potentially biased results.

Table 1.1 Number of Students Enrolled and Tested in the 2020–2021 Administration

|  |  |  |  |
| --- | --- | --- | --- |
| Content Area and Grade Level | Number of Students Enrolled | Number of Students Tested | Percent Tested |
| ELA 3 | 4,027 | 1,581 | 39% |
| ELA 4 | 4,437 | 1,701 | 38% |
| ELA 5 | 4,701 | 1,694 | 36% |
| ELA 6 | 4,552 | 1,653 | 36% |
| ELA 7 | 4,680 | 1,582 | 34% |
| ELA 8 | 4,789 | 1,547 | 32% |
| ELA 11 | 4,591 | 1,360 | 30% |
| Mathematics 3 | 4,027 | 1,561 | 39% |
| Mathematics 4 | 4,437 | 1,685 | 38% |
| Mathematics 5 | 4,701 | 1,672 | 36% |
| Mathematics 6 | 4,552 | 1,630 | 36% |
| Mathematics 7 | 4,680 | 1,562 | 33% |
| Mathematics 8 | 4,789 | 1,527 | 32% |
| Mathematics 11 | 4,591 | 1,336 | 29% |

Given that the 2018–‍2019 administration’s operational test forms and the corresponding conversion tables were reused in 2020–2021, the student test scores from the 2020–2021 administration were preequated to the baseline scale established for each assessment in the 2015–2016 administration.

### Groups and Organizations Involved with the CAAs for ELA and Mathematics

#### California State Board of Education

The California State Board of Education (SBE) is the state agency that establishes educational policy for kindergarten through grade twelve in the areas of standards, instructional materials, assessment, and accountability. The SBE adopts textbooks for kindergarten through grade eight, adopts regulations to implement legislation, and has the authority to grant waivers of the *EC*.

In addition to adopting the rules and regulations for itself, its appointees, and California’s public schools, the SBE also is the state educational agency responsible for overseeing California’s compliance with the Every Student Succeeds Act and the state’s Public School Accountability Act, which measures the academic performance and progress of schools on a variety of academic metrics (CDE, 2021d).

#### California Department of Education

The CDE oversees California’s public school system, which is responsible for the education of more than 6,000,000 children and young adults in more than 10,500 schools. 1F[[2]](#footnote-3) California aims to provide a world-class education for all students, from early childhood to adulthood. The CDE serves the state by innovating and collaborating with educators, school staff, parents/guardians, and community partners which together, as a team, prepares students to live, work, and thrive in a highly connected world.

Within the CDE, it is the Instruction, Measurement, & Administration Branch that oversees programs promoting improved student achievement. Programs include oversight of statewide assessments and the collection and reporting of educational data (CDE, 2021c).

#### California Educators

A variety of California educators and content experts, including teachers experienced in teaching students with cognitive disabilities and school administrators—who were selected based on their qualifications, experience, demographics, and geographic locations—were invited to participate in the entire CAA assessment development process. This included defining the purpose and scope of the assessment, assessment design, item development, standard setting, score reporting, and scoring of the constructed-response items.

#### Contractors

##### Primary Testing Contractor—ETS

The CDE and the SBE contract with ETS to develop and administer the CAA and report CAA results. As the primary testing contractor, ETS has the overall responsibility for working with the CDE to implement and maintain an effective assessment system and coordinating ETS’ work with its subcontractors. Activities conducted directly by ETS include, but are not limited to, the following:

* Providing management of the program activities
* Supporting and training county offices of education, LEAs, and direct funded charter schools
* Providing a tiered help desk support system for LEAs
* Developing all CAA test items
* Constructing, producing, and controlling the quality of CAASPP test forms and related test materials, including grade- and content-specific *Directions for Administration (DFAs)*
* Hosting and maintaining a website with resources for LEA CAASPP coordinators
* Developing, hosting, and providing support for the Test Operations Management System (TOMS)
* Supporting CERS
* Processing student test assignments
* Producing and distributing score reports electronically
* Developing a score reporting website
* Completing all psychometric procedures

##### Subcontractor—Cambium Assessment, Inc.

ETS also monitors and manages the work of Cambium Assessment, Inc. (CAI), subcontractor to ETS for the CAASPP System of computer-based assessments. Activities conducted by CAI include

* providing the CAI proprietary test delivery system (TDS), including the Student Testing Interface, Test Administrator Interface, secure browser, and practice and training tests;
* hosting and providing support for its TDS, a component of the overall CAASPP Assessment Delivery System;
* scoring machine-scorable items; and
* providing high-level technology help desk support to LEAs for technology issues directly related to the TDS.

##### Subcontractor—Sacramento County Office of Education

ETS contracted with the Sacramento County Office of Education to manage all activities associated with educator recruitment, training, and outreach, including the following:

* Supporting and training county offices of education, LEAs, and charter schools
* Developing informational materials
* Recruiting and providing logistics for educator meetings

### Systems Overview and Functionality

#### Test Operations Management System

TOMS is the password-protected, web-based system used by LEAs to manage all aspects of CAASPP testing. TOMS serves various functions for the CAAs for ELA and mathematics, including, but not limited to, the following:

* Managing test administration windows
* Assigning the CAA test examiner user role
* Managing student test assignments and accessibility resources
* Viewing and downloading reports
* Providing a platform for authorized user access to secure materials, such as CAA *DFAs,* student data and results, CAASPP user information, and access to the CAASPP Security and Test Administration Incident Reporting System/Appeals process

TOMS receives student enrollment data, including LEA and school hierarchy data, from the California Longitudinal Pupil Achievement Data System (CALPADS) via a daily feed. CALPADS is “a longitudinal data system used to maintain individual-level data including student demographics, course data, discipline, assessments, staff assignments, and other data for state and federal reporting.”2F[[3]](#footnote-4)

LEA staff involved in the administration of the CAAs—such as LEA CAASPP coordinators, CAASPP test site coordinators, and test examiners—are assigned varying levels of access to TOMS. For example, only an LEA CAASPP coordinator is given permission to set up the LEA’s test administration window; a test examiner cannot download student reports. A description of user roles is explained more extensively in the *2020–2021 CAASPP Online Test Administration Manual* (CDE, 2021a).

#### Test Delivery System

The TDS is the means by which the statewide computer-based assessments are delivered to students. Components of the TDS include

* the Test Administrator Interface, the web browser–based application that allows test examiners to activate student tests;
* the Student Testing Interface, on which students take the CAAs for ELA and mathematics using the secure browser and with assistance from the test examiner as needed; and
* the secure browser, the web-based application through which the Student Testing Interface may be accessed. The secure browser prevents students from accessing other applications during testing.

#### Practice and Training Tests

Practice tests for each individual grade level and content area and a training test suitable for all grade levels in both ELA and mathematics were provided to LEAs to prepare students and LEA staff for the CAAs. Students, teachers, and the public could access them using a web browser.

These tests simulated the experience of the CAA computer-based assessments and allowed students and test examiners to become familiar with the user interface, item formats and functionality, available accessibility resources, and components of the TDS, as well as with the process of starting and completing a testing session. Unlike the summative CAAs for ELA and mathematics, the practice and training tests did not assess standards, gauge student success on the operational test, or produce scores.

#### California Educator Reporting System

CERS is the system used by LEAs to view preliminary student results from the CAASPP assessments. The primary purpose of CERS is to provide educators and administrators with access to timely test results data for individual students and groups of students.

CERS allows educators to view their students’ assessment results at the individual student level and at the aggregated level using grouping and other features. For example, educators can create customized groups from assigned student groups based on demographic information, achievement level, or other characteristics of their choosing. The student results sent to CERS are appropriate for analysis of assessment results for use in planning instruction.

### Overview of the Technical Report

This technical report addresses the characteristics of the CAAs for ELA and mathematics administered in spring 2021. The technical report contains nine additional chapters as follows:

* [Chapter 2](#_Overview_of_the) presents an overview of the processes involved in a testing cycle for the CAAs for ELA and mathematics. This includes item development, test assembly, test administration, test taking, generation of test scores, and score reports.
* [Chapter 3](#_Item_Development_and) describes the procedures followed during item development, various reviews (e.g., item content and bias and sensitivity reviews), and the process of item review.
* [Chapter 4](#_Test_Assembly_2) describes the process of test assembly, including the content being measured, the two-stage MST assessment design, and the content and psychometric criteria. Also discussed are the routing rules that guided the construction of the CAAs for ELA and mathematics and the preparation of the test forms for the computer-based multistage delivery.
* [Chapter 5](#_Test_Administration) details the processes involved in the actual 2020–2021 administration, with emphasis on efforts made to ensure the standardization of CAA computer-based testing. It also describes the procedures followed to maintain test security throughout the test administration process.
* [Chapter 6](#_Standard_Setting) summarizes the standard setting process that established the base year achievement level scores. Details include the achievement level descriptors, an overview of the standard setting methodology, and the process used to establish the threshold scores that define the score ranges for each achievement level for the CAAs for ELA and mathematics. These standard setting processes were based on student testing results from the 2015–2016 administration.
* [Chapter 7](#_Scoring_and_Reporting) provides information on the scoring processes and summarizes the types of scores and score reports.

* [Chapter 8](#_Psychometric_Analyses) summarizes the statistical procedures performed for each administration. Note that most of these statistical procedures were not conducted for the 2020–2021 administration because of small sample sizes. During a typical CAA administration, these analyses include
* classical item analysis;
* differential item functioning analysis;
* IRT calibration, linking, and scaling;
* reliability analyses; and
* analyses of the consistency and accuracy of the achievement-level classifications.

[Chapter 8](#_Psychometric_Analyses) concludes with a discussion of the procedures designed to ensure the validity of score uses and interpretations.

* [Chapter 9](#_Quality_Control_Procedures_2) highlights the quality control processes used at various stages of the 2020–‍2021 CAA administration, including item development, test assignment, test administration, scoring procedures, psychometric analysis processes, and score reporting.
* [Chapter 10](#_Continuous_and_Systematic) describes analysis and administration processes and features targeted for improvement during future test administrations.

### References

*California* *Code of Regulations,* Title 5, Education, Division 1, Chapter 2, Subchapter 3.75, Article 2.

California Department of Education. (2021a). *CAASPP online test administration manual.* Sacramento, CA: California Department of Education.

California Department of Education. (2021b). *California Alternate Assessments for ELA and math.* California Department of Education website.

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## Overview of CAAs for ELA and Mathematics Processes

This chapter provides a brief description of the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics process, including item development, test design, test administration, and scoring. The details about each step in the process will be presented in the subsequent chapters.

### Item Development

CAAs for ELA and mathematics incorporate innovations and best practices from the recent alternate assessment initiatives on a national level, including the National Center and State Collaborative (NCSC) and the Dynamic Learning Maps. All items developed and used in the 2020–2021 CAA administration are appropriate for the grade level, aligned with the Core Content Connectors (Connectors) and their essential understandings (EUs), corresponded to the Common Core State Standards (CCSS), and based on the clarifications and guidelines from the Connectors derived from the CCSS.

Similar to the NCSC model, items were developed to three tiers of item complexity. Items were reviewed and revised at various stages during development by a variety of groups, including the California Department of Education (CDE), California educators, and ETS content specialists and item reviewers. Guidelines for bias and sensitivity, accessibility and accommodations, and style helped item developers and reviewers ensure consistency and fairness through the item development process. Detailed information about CAAs for ELA and mathematics item development is described in [*Chapter 3: Item Development and Review*](#_Item_Development_and).

#### Item Format

The CAAs for ELA and mathematics include the following primary computer-based item formats:

* **Selected-response (SR) items—**Students are instructed to select one or more choices. Most CAA items have two or three options; a few items have four options.
* **Constructed-response (CR) items—**Students are required to respond by providing words or numbers. The student’s test examiner used a rubric to score a student’s items during the one-on-one administration.
* **Technology-enhanced items (TEIs)—**Technology beyond simple option selection is incorporated in some items.

Table 3.1 in [*Chapter 3: Item Development and Review*](#_Item_Development_and) lists the types of TEIs. The first column contains the types of responses that can be made to test questions; the middle column lists the item type for the response type. The third column describes how the student is expected to use that response type in answering the test item.

SR items have either one or two points and are machine-scored. There are a small number of CR items in the CAA for ELA, which also are worth either one or two points. Scoring rubrics specific to each CR item are included in the secure *Directions for Administration (DFAs)* and are used by the test examiner to rate a student’s responses. All rubric-based human scoring or rating was done by the test examiner during the test administration.

#### Item Specifications

The CAAs for ELA and mathematics item specifications describe the item characteristics that are intended to measure each content standard consistently. They were developed based on the CCSS guidelines and clarifications from the Connectors and EUs. During item development, item developers were provided with CAAs for ELA and mathematics item specifications and a CAA style guide that contained detailed information about the consistency in item development and item review processes. Refer to subsection [*3.1.2 Item Specifications*](#_Item_Specifications) in [chapter 3](#_Item_Development_and) for detailed information about item specifications.

#### Item Banking

To support sophisticated computer adaptive testing designs, it was necessary to build an item bank where content and statistical attributes of each item were included. All the items in the item bank needed to be calibrated and linked onto common scales.

The test forms of the 2019–2020 CAAs for ELA and mathematics administration were largely reused during the 2020–2021 administration; the CAAs for mathematics for grade eleven used one replacement field test item. The 2019–2020 and 2020–2021 test forms used the same operational items as in the 2018–2019 forms, with the field test items replaced with either newly developed items or items whose item parameters were estimated in Stage 2 during a previous CAA administration. Because of the impact of the novel coronavirus disease 2019 pandemic, which resulted in less than one half of the eligible, enrolled students testing during the 2020–2021 administration, a preequated design was used to link the operational items’ parameters to the baseline scale established in the 2015–2016 administration. As a result, field test items were neither calibrated nor linked onto the baseline scale in 2020–2021.

In a typical CAA administration, when postequating design is used, the operational items include

* anchor items that had been used in previous years and served as statistical linkage to link the item response theory (IRT) scale based on the test administration data to the baseline scale; and
* Non-anchor operational items that were not used as anchor items for linking purposes.

An insufficient number of students tested during the 2020–2021 administration to support statistical analysis. When enough students test to support the analyses in a subsequent test administration, initial item analyses are implemented, and the results are reviewed by ETS psychometric and Assessment and Learning Technology Research & Development staff, who provide recommendations to the CDE on whether the items should be included or excluded from the calibrations. Decisions are made in consultation with the CDE; details of this process are in section[*8.2 Classical Item Analysis*](#_Classical_Item_Analysis).

Next, both the non-anchor operational items and field test items are calibrated and linked through the anchor items to the baseline scales that were established in the 2015–2016 administration. Refer to section [*8.3 Item Response Theory Analyses*](#_Item_Response_Theory_1) for calibration and linking. Final item analyses are conducted following the calibration and linking step.

Content experts from ETS and the CDE, as well as selected California educators, review the associated item statistics and evaluate the performance of items during the annual data review meeting. They also review the flagged items—those whose statistics fell beyond expected ranges—and work to provide plausible explanations for these particular items based on their knowledge of the student population.

With the CDE’s approval, the non-anchor operational items and field test items, together with their statistical information, are entered into the item bank for form assembly in future administrations. It is expected that more new items will be developed, field-tested, and entered into the item bank after an administration. Over time, the item bank will expand gradually to support the multistage test (MST) design.

### Test Assembly

#### Test Design

The CAAs for ELA and mathematics use an MST design, which consists of a small number of separate modules that can be assembled to meet a set of specifications for item content and item difficulty. On the basis of their performance in Stage 1, students are routed to an appropriate module of the next stage. With this design, only a few modules need to be selected to match students’ abilities, and students with a variety of ability levels can be measured with higher precision and shorter test length.

The general principle of MST is that students within the eligible testing population who experience difficulties with the simplest tasks should not continue on with more difficult items. Therefore, after the last item in Stage 1, the results from the Stage 1 router allow an algorithm to identify those students for whom meaningful measurement is unlikely to occur, thus resulting in an early exit from the test. Continuing students are routed to one of two Stage 2 modules appropriate for their ability level.

The MST design for the CAAs for ELA and mathematics uses tiered items, which are developed to three tiers of complexity and organized in order of increasing difficulty and cognitive load. This two-stage adaptive procedure has one common Stage-1 module and two Stage-2 modules (easy and hard).

MST is beneficial for students with a wide range of cognitive disabilities because routing rules are used to direct students to the modules that fit their ability levels and thus minimize the students’ test-taking burden and enhance their testing experience. Refer to subsection [*4.2.2 English Language Arts/Literacy and Mathematics Test Design*](#_English_Language_Arts/Literacy) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for more details about the MST design.

The routing rules that determine whether and how a student transitions from the first to second stage of the test are based on a simulation study in which student ability distributions were estimated for each grade level and subject based on the data collected from the 2017–2018 administration. Refer to subsection [*4.2.3 Routing Rules for the 2020–‍2021 Administration*](#_Routing_Rules_for)in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for detailed information about the routing rules.

#### Test Blueprints

Test blueprints specify the total number of items on each test and the number of items in each content category according to standards. The standards upon which CAAs for ELA and mathematics test blueprints are built consist of the Connectors and EUs, both derived from the CCSS. The blueprints were developed with reference to the blueprints authored by the NCSC; California educators were involved in this procedure. The blueprints for the CAAs for ELA and mathematics for grades three through eight and grade eleven were adopted by the State Board of Education in June 2015.

The CAAs for ELA and mathematics test blueprints are unique to each grade level and content area. These blueprints designate the breakdown first by content category (e.g., ELA) and then by Connectors. Information on each test blueprint includes

* the specific ratio of each content category or domain on the overall test,
* specific Connectors to be assessed,
* specific EUs to be assessed, and
* the maximum number of total items.

The CAA blueprints also include a content coverage percentage comparison to the NCSC blueprints upon which the CAA blueprints are based (CDE, 2015a and 2015b).

#### Test Length

The number of items in each of the CAAs for ELA and mathematics is the same across grades and subjects—there are 10 operational items followed by four embedded field test items in each version at Stage 1 and then 15 items per module at Stage 2. Each student answers 29 items for a complete test. The unique core router at Stage 1 is administered to all students along with one of the five embedded field test versions that are randomly assigned at the school level.

At Stage 2, each of the two modules—easy and hard—is tailored to a particular student ability level with appropriate items. Each Stage 2 module consists of 15 items with prior item statistics. All items in Stage 1 and Stage 2 are potentially used as anchor items in postequating to link items without prior statistics to the baseline scale. As a result, this test design allows the calibration of approximately 20 new items in each grade-level test that can be potentially entered into the item bank and will support the future operational test administrations.

Refer to section [*4.2 Test Design*](#_Test_Design) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for more details on test form assembly.

#### Psychometric Criteria

Psychometric criteria are specified for the test form review before the test administration. The psychometric guidelines of item selection and form building are typically developed during the preliminary review of the assembled test forms for an administration. Because of the reuse of test forms during the 2020–2021 administration, the review of psychometric criteria was not conducted in 2020–2021.

Prior to an administration, ETS content and psychometric staff review the assembled forms thoroughly in regard to the following aspects:

* Coverage of blueprints
* Overall test design and statistical properties
* Statistical properties of individual items
* Number and position of anchor items

Details of the psychometric criteria of form review are included in section [*4.3 Test Production Process*](#_Test_Production_Process). Psychometric criteria of items include the following:

* **Average Item Score (AIS) Range:** Items that are too difficult or too easy, indicated by a low or high AIS, should not be used as they serve little purpose in differentiating test takers’ abilities. The acceptable AISrange is generally between .10 and .95 for 1-point items and between .20 and 1.90 for 2-point items. Refer to subsection [*8.2.1.1 Classical Item Difficulty Indices (p-value and Average Item Score)*](#_Classical_Item_Difficulty) for additional information about this criterion.
* **Polyserial Correlations:** Non-discriminating items, indicated by a low polyserial correlation value, should not be used. For test assembly, the recommended minimum polyserial correlation value is .20. However, given the limited number of CAA items in the item bank, for the spring 2020–2021 administration, items with a polyserial correlation value between .10 and .20 could be included on the CAA forms to ensure complete test content coverage. Refer to subsection [*8.2.1.2 Item-Total Correlation*](#_Item-Total_Correlation) for additional information about this criterion.
* **Differential Item Functioning (DIF):** An item classified into Category C (large) shows moderate to large DIF and should not be included in the operational form. If it is absolutely necessary to include an item exhibiting C-DIF on a test or if such an item is found on an operational form, the item must be reviewed by a panel that includes members of the focal group(s) affected. The members of the panel should not have a vested interest in the outcome of the decision. If no explanation for the DIF can be found, the item may be scored, if in an operational form, or may appear on the assembled test. In the latter case, the inclusion of no C-DIF items is preferred because this circumstance is beyond reproach in most cases. Additionally, if an item exhibiting C-DIF must be selected, then a balance with regard to the C-DIF item should be considered; that is, C-DIF items should not be all C- or all C+. Refer to section [*8.5 Differential Item Functioning Analyses*](#_Differential_Item_Functioning) for additional information about this criterion.

After the test forms are assembled, routing thresholds for each of the CAAs for ELA and mathematics are established to determine which test form a student should take. In other words, routing thresholds determine which Stage 2 module a student is routed to or whether the test should be ended after Stage 1. The threshold values are determined through a simulation study to maximize test reliability and test information function.

### Test Administration

The CAAs for ELA and mathematics are computer-based and administered using the secure browser and test delivery system (TDS), ensuring a secure, confidential, standardized, consistent, and appropriate administration for students. Each CAA is administered in a one-on-one setting by a trained test examiner, usually the student’s teacher. Test examiners and students have an opportunity to use the CAAs for ELA and mathematics training and practice tests to gain experience with different types of questions before taking the scored tests.

#### Test Security and Confidentiality

All tests within the California Assessment of Student Performance and Progress (CAASPP) System are secure. For the CAAs, every person having access to test materials maintains the security and confidentiality of the tests. ETS’ internal Code of Ethics required that all test information, including tangible materials associated with the CAAs (such as test questions and test results), confidential files, processes, and activities are kept secure. To ensure security for all tests that ETS develops or handles, ETS maintains an Office of Testing Integrity (OTI). A detailed description of the OTI and its mission is presented in subsection [*5.2.1 ETS’ Office of Testing Integrity*](#_ETS’_Office_of).

In pursuit of enforcing secure practices, ETS strives to safeguard the various processes involved in a test development and administration cycle. The practices related to each of the following security processes are discussed in detail in [chapter 5](#_Test_Administration):

* [Procedures to maintain standardization of test security](#_Procedures_to_Maintain)
* [Test security monitoring](#_Test_Security_Monitoring)
* [Security of electronic files using a firewall](#_Security_of_Electronic)
* [Transfer of scores via secure data exchange](#_Transfer_of_Scores)
* [Data management in the secure database](#_Data_Management_in)
* [Statistical analysis on secure servers](#_Statistical_Analysis_on)
* [Student confidentiality](#_Student_Confidentiality)
* [Student test results](#_Student_Test_Results)

#### Procedures to Maintain Standardization

ETS takes all necessary measures to ensure the standardization of CAA test administration by individual test examiners. The measures for standardization include, but are not limited to, the aspects described in these subsections.

##### Test Examiners

ETS employs processes to ensure the standardization of an administration cycle; these processes are discussed in more detail in [*Chapter 5: Test Administration*](#_Test_Administration).

All staff at local educational agencies (LEAs) that are involved in the CAASPP administration, including CAAs for ELA and mathematics administration, are provided directions about their responsibilities. Their roles include LEA CAASPP coordinators, CAASPP test site coordinators, and CAA test examiners. The responsibilities of each of the staff members specifically for the CAAs are described in the *CAASPP Online Test Administration Manual* (CDE, 2021c). (Refer to [*5.4.4.2 CAASPP Online Test Administration Manual*](#_CAASPP_Online_Test_1) in [chapter 5](#_Test_Administration) for more information.)

##### Test Directions

Several series of instructions regarding the CAASPP, including administration of the CAAs for ELA and mathematics, are compiled in detailed manuals and provided to the LEA staff. Such documents include, but are not limited to, the following:

* ***CAAs for ELA and Mathematics DFA*s—**The grade-level *DFAs* are manuals that provide the scripts to be followed exactly by test examiners during a testing session. The secure *DFAs* for the CAAs for ELA and mathematics contain item-specific instructions and, therefore, are grade- and version-specific. (Refer to [*5.4.4.1 Directions for Administration*](#_Directions_for_Administration) in [chapter 5](#_Test_Administration) for more information.)
* ***CAASPP Online Test Administration Manual*—**This is a web-based manual that provides test administration procedures and guidelines for LEA CAASPP coordinators, CAASPP test site coordinators, test examiners, and test administrators (CDE, 2021c). (Refer to [*5.4.4.2 CAASPP Online Test Administration Manual*](#_CAASPP_Online_Test_1) in [chapter 5](#_Test_Administration) for more information.)
* **C*AASPP and English Language Proficiency Assessments for California (ELPAC) Test Operations Management System (TOMS) User Guide***—This is a web-based manual that provides instructions for TOMS that allow LEA staff, including LEA CAASPP coordinators and CAASPP test site coordinators, to perform a number of tasks including setting up test administrations, adding and managing users, configuring computer-based student test settings, and accessing the secure *DFAs* (CDE, 2021b). (Refer to [*5.4.4.3 CAASPP and English Language Proficiency Assessments for California Test Operations Management System User Guide*](#_CAASPP_and_English) in [chapter 5](#_Test_Administration) for more information.)

### Test-Taking Rates

The decision to assign a student to take a CAA is made by the student’s individualized education program (IEP) team using the information on the CDE Alternate Assessment IEP Team Guidance web page to make the determination. This web page describes the CAA and its administration as well as criteria for test taking and the students who should be identified to take this test (CDE, 2019a).

A student must meet all three of the following criteria to be identified to take the CAAs:

1. **The student has a significant cognitive disability.** Review of the student’s school records indicates a disability or multiple disabilities that significantly impact intellectual functioning and adaptive behavior essential for a person to live independently and to function safely in daily life.
2. **The student is learning content derived from the California CCSS or the California Next Generation Science Standards (CA NGSS)** **or is acquiring proficiency as identified in the 2012 English Language Development Standards (ELD Standards).** Goals and instruction listed in the IEP for the student are linked to the grade-level CA CCSS, CA NGSS, or 2012 ELD Standards and address knowledge and skills that are appropriate and set high expectations for this student.
3. **The student needs extensive, direct individualized instruction and substantial supports to achieve measurable gains in the grade-level and age-appropriate curriculum, including the following:**

* Instruction and support that are not of a temporary or transient nature
* Substantially adapted materials and individualized methods of accessing information in alternative ways to acquire, maintain, generalize, demonstrate, and transfer skills across multiple settings

All students who are identified by an IEP team to take the CAAs are required to take alternate assessments for all state standardized assessments. All students who are logged on and presented with at least the first test item are counted as having taken the test. Students who do not provide a consistent, observable response to the first item are not required to be administered the entire test but are counted as having taken the test (CDE, 2020a).

Refer to table 2.A.1 through table 2.A.4 in [appendix 2.A](#_Appendix_2.B:_CAA) for the number of students enrolled, the number of students tested, and the percent of enrolled students tested for selected demographic student groups for each assessment during the 2020–2021 administration. The tables were created using student demographic data that was in version 2 of the production data file (“P2”) received on September 30, 2021. Note that the data in the *Number Tested* columns includes students whose attemptedness codes indicate completion, partial-completion, and non-completion; these are discussed in subsection [*7.1.1 Scoring of Incomplete Cases*](#_Incomplete_and_Complete).

### Fairness and Accessibility

There are several procedures in place to ensure that the CAAs for ELA and mathematics are fair and accessible to all test takers. This section provides information on the available accessibility resources for use with the computer-based CAAs for ELA and mathematics. Additionally, the DIF analysis used to identify items that may function differently across groups of examinees (e.g., gender, ethnicity) is also discussed briefly.

Table 2.B.1 through table 2.B.4 in [appendix 2.B](#_Appendix_2.C:_Accessibility) presents the numbers and percentages of students assigned designated supports, accommodations, and unlisted resources for the 2020–2021 CAAs for ELA and mathematics administration. The use of universal tools is not tracked because they are available to all students in the TDS. The tables in [appendix 2.B](#_Appendix_2.C:_Accessibility) were created using student demographic data that was in version 2 of the production data file (“P2”) updated on September 27, 2021.

#### Universal Tools, Designated Supports, and Accommodations

The CAAs are specifically designed for students with significant cognitive disabilities and an IEP that calls for the use of an alternate assessment. Additional resources are often needed for these students.

The CDE maintains a list of the universal tools, designated supports, and accommodations that are permitted for use in CAASPP computer-based assessments in its web document, the California Assessment Accessibility Resources Matrix (Accessibility Matrix) (CDE, 2020b)*.* 3F

**Universal tools** are available to all students taking the CAAs. These resources may be turned on and off when embedded as part of the technology platform for the computer-based CAAs on the basis of student preference and selection.

**Designated supports** are available to students taking the CAAs when determined as needed by an educator or team of educators, with parent/guardian and student input as appropriate, or when specified in the student’s IEP.

**Accommodations** must be permitted on the CAAs for all eligible students when specified in the student’s IEP.

While most of the resources presented for the CAASPP computer-based assessments are available for the CAAs, there are a few resources that are not applicable because the CAAs are designed to be given one-on-one in the student’s language of instruction, using the student’s identified instructional resources.

##### Selection

The full list of the universal tools, designated supports, and accommodations used in CAASPP computer-based assessments, including the CAAs for ELA and mathematics, is documented in the Accessibility Matrix (CDE, 2020b). Most embedded and non-embedded universal tools, designated supports, and accommodations listed in parts 1, 2, and 3 of the Accessibility Matrix are available for the CAAs through the computer-based testing interface or, in the case of non-embedded resources, from the school or LEA. Part 4 of the Accessibility Matrix describes the instructional supports and resources available for students taking an alternate assessment. Part 5 of the Accessibility Matrix includes approved unlisted resources.

School-level personnel and IEP teams used the Accessibility Matrix when deciding how best to support the student’s test-taking experience. IEP teams may consider what other designated supports and accommodations, other than universal resources already available in the TDS, may be appropriate for the student. On the rare occasion when a student has both an IEP and a Section 504 plan, the Section 504 plan also should be referenced for accessibility resources.

##### Assignment

Designated supports and accommodations are assigned to individual students on the basis of identified student need. Such assignments are implemented in TOMS by the LEA CAASPP coordinator or CAASPP test site coordinator, either through individual assignment in the student’s profile in TOMS or in a batch upload for multiple students. For a batch upload, settings were uploaded into TOMS using a spreadsheet with data that had either been entered into a template downloaded from TOMS; or created by selecting and entering information into the web-based Individual Student Assessment Accessibility Profile (ISAAP) Tool. The ISAAP Tool could be used by LEAs in conjunction with the *Smarter Balanced Assessment Consortium:* *Usability, Accessibility, and Accommodations Guidelines* (Smarter Balanced, 2020)[[4]](#footnote-5) and the 2020–2021 CAASPP and ELPAC Accessibility Guide for Online Testing (CDE, 2021a), as well as with state regulations and policies (such as the Accessibility Matrix) related to assessment accessibility*.*

The embedded designated supports and accommodations were delivered to the student through the TDS at the time of testing; the non-embedded designated supports and accommodations were provided at the time of testing to the student by the LEA. Refer to section [*1.10 Systems Overview and Functionality*](#_Systems_Overview_and) in [*Chapter 1: Introduction*](#_Introduction) for more details regarding the TDS.

##### Delivery

Universal tools, designated supports, and accommodations can be delivered as either embedded or non-embedded resources. Embedded resources are digitally delivered features or settings available as part of the technology platform for the computer-based CAAs. Examples of embedded resources applicable to the CAAs include masking, color contrast, and print size. Non-embedded resources for the CAAs include magnification, calculator, and scribe.

#### Description of Differential Item Functioning Analyses

DIF analyses are typically conducted to detect differences in student performance by identifying items for which one group of students performs significantly better than another group (e.g., male vs. female or White vs. African-American) after matching students on ability. If an item performed differentially across student groups, even when students were matched on ability, the item may be measuring something other than the intended construct. Therefore, it is important to identify items flagged for DIF. Content experts and bias and sensitivity experts review these DIF-flagged items and determine the sources and meanings of performance differences. Refer to section [*8.5. Differential Item Functioning Analyses*](#_Differential_Item_Functioning) for additional information about DIF.

### Scores

Individual student scores were reported for the 2020–2021 CAAs for ELA and mathematics administration. Student performance on the reporting scale was designated into one of the three achievement levels described in subsection [*7.1.4 Achievement Levels*](#_Achievement_Levels_1).

#### Estimating Ability Scores

The IRT inverse test characteristic curve method (Stocking, 1996)—where the student’s ability value is estimated to be the value for which the expected number-correct score is equal to the student’s number-correct score—is used to estimate students’ overall ability parameters. For the purpose of reporting, students’ ability estimates (theta scores) are then expressed in three-digit scale scores by applying the appropriate linear transformation for each grade-level, content-area CAA for ELA or mathematics.

Student performance on the reporting scale is designated into one of three levels:

1. Level 1—Alternate
2. Level 2—Alternate
3. Level 3—Alternate

For information regarding score specifications and the establishment of score-reporting scales, refer to [*Chapter 7: Scoring and Reporting*](#_Scoring_and_Reporting)*.* For information regarding CAA levels, refer to [*Chapter 6: Standard Setting*](#_Standard_Setting) for a description of the process used to set achievement-level standards.

#### Score Reporting

TOMS is a secure website hosted by ETS that permits LEA users to manage aspects of CAASPP test administration such as test assignment and the assignment of test settings. It also provides a secure means for LEA CAASPP coordinators to download SSRs as PDF files.

CAA scores can also be viewed through the California Educator Reporting System (CERS), a secure website that provides authorized users with interactive and cumulative online reports for ELA and mathematics at the student, school, and LEA levels. CERS also provides an individual score report. Refer to subsection [*7.3.1 Online Reporting*](#_Online_Reporting) for details about TOMS and CERS, and refer to subsection [*7.3.3 Types of Score Reports*](#_Types_of_Score) for the content of each type of score report.

#### Aggregation Procedures

To provide meaningful results to interested educators, CAA scores for a given grade and content area were aggregated at the school, LEA or direct funded charter school, county, and state levels. State-level results are available on the Test Results for California’s Assessments website. The aggregated scores were presented for all students or selected demographic student groups. A variety of aggregated score types were also used to check the validity of the scores.

The aggregation procedures used to present CAA results are described in section [*7.2 Overview of Score Aggregation Procedures*](#_Overview_of_Score). Aggregated scores that summarize student performance for selected groups of students in each grade level and content area are provided in table 7.D.1 through table 7.D.14 in [appendix 7.D](#_Appendix_7.D:_Demographic). The tables show the numbers of students tested, means and standard deviations of scale scores, and percentage of students in each achievement level. Students are grouped by demographic characteristics, including gender, ethnicity, English language fluency, primary disability, and economic status. To protect student privacy, statistics are presented in the tables as “N/A” when the number of students in the sample is fewer than 11. Definitions for the demographic student groups included in these tables are provided in table 7.6.

### Equating

The purpose of equating using IRT models is to place item difficulty and student ability estimates onto a common theta scale for a given grade and content area. As a result, scores on pathways that included the router and different modules of Stage 2 were statistically adjusted to compensate for differences in test difficulty; refer to table 4.2 in subsection [*4.2.1.4 Pathways*](#_Pathways) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for details about pathways.

IRT models (Hambleton & Swaminathan, 1985) are used to establish a common scale initially and provide ongoing maintenance of the program. The baseline scale for the CAAs for ELA and mathematics were established by calibrating samples of item response data from the 2015–2016 administration to which the item calibrations of the subsequent administrations could be linked.

For the 2020–2021 administration, all operational items had appeared as operational items and were previously calibrated and linked onto the baseline scale during the 2018–2019 administration. The conversion tables constructed during the 2018–2019 administration were reused during the 2020–2021 administration. By reusing the conversion tables constructed during the 2018–2019 administration in 2020–2021, the resultant student scores were placed on the baseline scale.

In a typical test administration, CAAs for ELA and mathematics equating has three steps: item calibration, linking, and scaling, as described next. The results of the equating procedure are further used to support scoring and item banking.

#### Calibration

Typically, a concurrent calibration is implemented to estimate parameters for all administration items, including embedded field test items and all operational items. As a result of the concurrent calibration, the item parameter estimates are placed on a common scale for test items from the same grade and content area.

The concurrent calibration required either “common items” or “random equivalent groups.” The CAAs for ELA and mathematics MSTs are assembled with common items between modules, which supports the efficiency and accuracy of the concurrent calibrations. Refer to subsection [*4.2.2. English Language Arts/Literacy and Mathematics Test Design*](#_English_Language_Arts/Literacy) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for the number and distributions of these items in each test.

The one-parameter logistic IRT model (Hambleton et al., 1991) and the partial credit model (Masters, 1982) are used for item calibration of the CAAs with flexMIRT® (Cai, 2017) version 3.51 software.

Detailed procedures for the concurrent calibrations are included in subsection [*8.3.2.1 Calibration*](#_Item_Calibration).

#### Linking

Linking is a procedure where items from different test forms or administrations are placed onto the reference scale so that items can be compared across forms and administrations. Calibrated item parameters for items on each grade-level test in the administration are linked to the reference scale that was established in spring 2016 with the mean-to-mean linking method (Loyd & Hoover, 1980).

Refer to subsection [*8.3.2.2 Linking the Item Parameters*](#_Linking_the_Item) in [*Chapter 8: Psychometric Analyses*](#_Psychometric_Analyses) for additional information.

#### Scaling

Scaling refers to the procedure by which the number-correct scores (raw scores) on each new form are transformed to the scale scores on the reference-year scale, so that the scores of students who take different forms are comparable. Once the new item calibrations for each test are transformed to the reference year scale, the new form number-correct scores (raw scores) are also transformed to their respective ability (theta) scores. Subsequently, these ability (theta) scores are transformed to scale scores through linear transformation.

Details of the scaling procedure can be found in subsection [*8.3.2.3 Scaling the Scores*](#_Scaling_the_Scores)of [*Chapter 8: Psychometric Analyses*](#_Psychometric_Analyses).

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### Appendix 2.A: CAA Test-Taking Rates

Table 2.A. CAA 2020–2021 Test-Taking Rates—ELA, Grades Three Through Six

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 3: Number Enrolled | Grade 3: Number Tested | Grade 3: Percent Tested | Grade 4: Number Enrolled | Grade 4: Number Tested | Grade 4: Percent Tested | Grade 5: Number Enrolled | Grade 5: Number Tested | Grade 5: Percent Tested | Grade 6: Number Enrolled | Grade 6: Number Tested | Grade 6: Percent Tested |
| All | 4,027 | 1,581 | 39.3 | 4,437 | 1,701 | 38.3 | 4,701 | 1,694 | 36.0 | 4,552 | 1,653 | 36.3 |
| Male | 2,800 | 1,111 | 39.7 | 3,078 | 1,168 | 37.9 | 3,199 | 1,183 | 37.0 | 3,095 | 1,145 | 37.0 |
| Female | 1,227 | 470 | 38.3 | 1,359 | 533 | 39.2 | 1,502 | 511 | 34.0 | 1,457 | 508 | 34.9 |
| Nonbinary | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| American Indian or Alaska Native | 22 | 9 | 40.9 | 20 | 9 | 45.0 | 29 | 13 | 44.8 | 29 | 18 | 62.1 |
| Asian | 397 | 131 | 33.0 | 408 | 150 | 36.8 | 404 | 131 | 32.4 | 383 | 138 | 36.0 |
| Native Hawaiian or Other Pacific Islander | 15 | 3 | 20.0 | 19 | 3 | 15.8 | 16 | 7 | 43.8 | 16 | 6 | 37.5 |
| Filipino | 103 | 33 | 32.0 | 106 | 42 | 39.6 | 116 | 38 | 32.8 | 108 | 41 | 38.0 |
| Hispanic or Latino | 2,268 | 816 | 36.0 | 2,580 | 927 | 35.9 | 2,618 | 867 | 33.1 | 2,606 | 877 | 33.7 |
| Black or African American | 297 | 95 | 32.0 | 310 | 99 | 31.9 | 408 | 121 | 29.7 | 353 | 105 | 29.7 |
| White | 705 | 391 | 55.5 | 786 | 395 | 50.3 | 888 | 419 | 47.2 | 823 | 385 | 46.8 |
| Two or more races | 220 | 103 | 46.8 | 208 | 76 | 36.5 | 222 | 98 | 44.1 | 234 | 83 | 35.5 |

Table 2.A.1 *(continuation one)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 3: Number Enrolled | Grade 3: Number Tested | Grade 3: Percent Tested | Grade 4: Number Enrolled | Grade 4: Number Tested | Grade 4: Percent Tested | Grade 5: Number Enrolled | Grade 5: Number Tested | Grade 5: Percent Tested | Grade 6: Number Enrolled | Grade 6: Number Tested | Grade 6: Percent Tested |
| English only | 2,441 | 1,065 | 43.6 | 2,627 | 1,075 | 40.9 | 2,852 | 1,113 | 39.0 | 2,610 | 1,024 | 39.2 |
| Initial fluent English proficient (IFEP) | 40 | 16 | 40.0 | 44 | 17 | 38.6 | 40 | 18 | 45.0 | 42 | 18 | 42.9 |
| English learner (EL) | 1,338 | 395 | 29.5 | 1,438 | 459 | 31.9 | 1,428 | 382 | 26.8 | 1,429 | 421 | 29.5 |
| Reclassified fluent English proficient (RFEP) | 207 | 105 | 50.7 | 325 | 149 | 45.8 | 377 | 180 | 47.7 | 469 | 189 | 40.3 |
| Adult English learner (ADEL) | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| To be determined | 1 | 0 | 0.0 | 2 | 1 | 50.0 | 4 | 1 | 25.0 | 2 | 1 | 50.0 |
| English proficiency unknown | 0 | 0 | N/A | 1 | 0 | 0.0 | 0 | 0 | N/A | 0 | 0 | N/A |
| Not economically disadvantaged | 1,443 | 607 | 42.1 | 1,620 | 671 | 41.4 | 1,645 | 654 | 39.8 | 1,668 | 649 | 38.9 |
| Economically disadvantaged | 2,584 | 974 | 37.7 | 2,817 | 1,030 | 36.6 | 3,056 | 1,040 | 34.0 | 2,884 | 1,004 | 34.8 |
| Migrant education | 24 | 11 | 45.8 | 15 | 7 | 46.7 | 24 | 13 | 54.2 | 21 | 8 | 38.1 |
| Not migrant education | 4,003 | 1,570 | 39.2 | 4,422 | 1,694 | 38.3 | 4,677 | 1,681 | 35.9 | 4,531 | 1,645 | 36.3 |

Table 2.A.1 *(continuation two)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 3: Number Enrolled | Grade 3: Number Tested | Grade 3: Percent Tested | Grade 4: Number Enrolled | Grade 4: Number Tested | Grade 4: Percent Tested | Grade 5: Number Enrolled | Grade 5: Number Tested | Grade 5: Percent Tested | Grade 6: Number Enrolled | Grade 6: Number Tested | Grade 6: Percent Tested |
| Intellectual disability | 1,159 | 453 | 39.1 | 1,355 | 545 | 40.2 | 1,589 | 574 | 36.1 | 1,578 | 599 | 38.0 |
| Hearing impairment | 24 | 7 | 29.2 | 28 | 6 | 21.4 | 42 | 7 | 16.7 | 37 | 10 | 27.0 |
| Speech or language impairment | 96 | 44 | 45.8 | 74 | 35 | 47.3 | 53 | 29 | 54.7 | 47 | 17 | 36.2 |
| Visual impairment | 13 | 1 | 7.7 | 17 | 4 | 23.5 | 15 | 4 | 26.7 | 12 | 2 | 16.7 |
| Emotional disturbance | 11 | 6 | 54.5 | 21 | 7 | 33.3 | 21 | 10 | 47.6 | 25 | 15 | 60.0 |
| Orthopedic impairment | 104 | 29 | 27.9 | 136 | 41 | 30.1 | 165 | 37 | 22.4 | 127 | 28 | 22.0 |
| Other health impairment | 246 | 109 | 44.3 | 250 | 106 | 42.4 | 235 | 93 | 39.6 | 256 | 106 | 41.4 |
| Specific learning disability | 118 | 56 | 47.5 | 180 | 96 | 53.3 | 254 | 127 | 50.0 | 279 | 123 | 44.1 |
| Deaf–blindness | 0 | 0 | N/A | 1 | 0 | 0.0 | 2 | 2 | 100.0 | 6 | 3 | 50.0 |
| Multiple disabilities | 267 | 81 | 30.3 | 283 | 83 | 29.3 | 341 | 88 | 25.8 | 337 | 93 | 27.6 |
| Autism | 1,979 | 791 | 40.0 | 2,073 | 771 | 37.2 | 1,964 | 713 | 36.3 | 1,833 | 652 | 35.6 |
| Traumatic brain injury | 10 | 4 | 40.0 | 19 | 7 | 36.8 | 20 | 10 | 50.0 | 15 | 5 | 33.3 |

Table 2.A. CAA 2020–2021 Test-Taking Rates—ELA, Grades Seven, Eight, and Eleven

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 7: Number Enrolled | Grade 7: Number Tested | Grade 7: Percent Tested | Grade 8: Number Enrolled | Grade 8: Number Tested | Grade 8: Percent Tested | Grade 11: Number Enrolled | Grade 11: Number Tested | Grade 11: Percent Tested |
| All | 4,680 | 1,582 | 33.8 | 4,789 | 1,547 | 32.3 | 4,591 | 1,360 | 29.6 |
| Male | 3,088 | 1,044 | 33.8 | 3,224 | 1,058 | 32.8 | 3,062 | 925 | 30.2 |
| Female | 1,592 | 538 | 33.8 | 1,565 | 489 | 31.2 | 1,529 | 435 | 28.4 |
| Nonbinary | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| American Indian or Alaska Native | 20 | 12 | 60.0 | 24 | 10 | 41.7 | 24 | 11 | 45.8 |
| Asian | 409 | 138 | 33.7 | 392 | 130 | 33.2 | 372 | 86 | 23.1 |
| Native Hawaiian or Other Pacific Islander | 19 | 9 | 47.4 | 17 | 7 | 41.2 | 22 | 6 | 27.3 |
| Filipino | 102 | 21 | 20.6 | 118 | 39 | 33.1 | 119 | 31 | 26.1 |
| Hispanic or Latino | 2,705 | 838 | 31.0 | 2,778 | 823 | 29.6 | 2,673 | 749 | 28.0 |
| Black or African American | 348 | 104 | 29.9 | 338 | 91 | 26.9 | 325 | 84 | 25.8 |
| White | 874 | 390 | 44.6 | 941 | 381 | 40.5 | 930 | 355 | 38.2 |
| Two or more races | 203 | 70 | 34.5 | 181 | 66 | 36.5 | 126 | 38 | 30.2 |
| English only | 2,593 | 966 | 37.3 | 2,647 | 973 | 36.8 | 2,464 | 803 | 32.6 |
| IFEP | 45 | 16 | 35.6 | 36 | 9 | 25.0 | 61 | 15 | 24.6 |
| EL | 1,354 | 367 | 27.1 | 1,314 | 313 | 23.8 | 1,153 | 267 | 23.2 |
| RFEP | 688 | 233 | 33.9 | 789 | 251 | 31.8 | 913 | 275 | 30.1 |
| ADEL | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| To be determined | 0 | 0 | N/A | 3 | 1 | 33.3 | 0 | 0 | N/A |
| English proficiency unknown | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |

Table 2.A.2 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 7: Number Enrolled | Grade 7: Number Tested | Grade 7: Percent Tested | Grade 8: Number Enrolled | Grade 8: Number Tested | Grade 8: Percent Tested | Grade 11: Number Enrolled | Grade 11: Number Tested | Grade 11: Percent Tested |
| Not economically disadvantaged | 1,619 | 575 | 35.5 | 1,704 | 599 | 35.2 | 1,776 | 550 | 31.0 |
| Economically disadvantaged | 3,061 | 1,007 | 32.9 | 3,085 | 948 | 30.7 | 2,815 | 810 | 28.8 |
| Migrant education | 33 | 9 | 27.3 | 10 | 4 | 40.0 | 21 | 5 | 23.8 |
| Not migrant education | 4,647 | 1,573 | 33.8 | 4,779 | 1,543 | 32.3 | 4,570 | 1,355 | 29.6 |
| Intellectual disability | 1,833 | 642 | 35.0 | 1,881 | 625 | 33.2 | 1,825 | 590 | 32.3 |
| Hearing impairment | 34 | 9 | 26.5 | 32 | 11 | 34.4 | 43 | 8 | 18.6 |
| Speech or language impairment | 41 | 11 | 26.8 | 41 | 22 | 53.7 | 19 | 7 | 36.8 |
| Visual impairment | 15 | 4 | 26.7 | 21 | 1 | 4.8 | 19 | 7 | 36.8 |
| Emotional disturbance | 28 | 14 | 50.0 | 31 | 16 | 51.6 | 58 | 11 | 19.0 |
| Orthopedic impairment | 158 | 44 | 27.8 | 174 | 33 | 19.0 | 159 | 34 | 21.4 |
| Other health impairment | 245 | 94 | 38.4 | 223 | 74 | 33.2 | 202 | 63 | 31.2 |
| Specific learning disability | 260 | 119 | 45.8 | 265 | 116 | 43.8 | 317 | 115 | 36.3 |
| Deaf–blindness | 0 | 0 | N/A | 0 | 0 | N/A | 6 | 0 | 0.0 |
| Multiple disabilities | 333 | 91 | 27.3 | 364 | 92 | 25.3 | 335 | 87 | 26.0 |
| Autism | 1,710 | 545 | 31.9 | 1,730 | 546 | 31.6 | 1,588 | 434 | 27.3 |
| Traumatic brain injury | 23 | 9 | 39.1 | 27 | 11 | 40.7 | 20 | 4 | 20.0 |

Table 2.A. CAA 2020–2021 Test-Taking Rates—Mathematics, Grades Three Through Six

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 3: Number Enrolled | Grade 3: Number Tested | Grade 3: Percent Tested | Grade 4: Number Enrolled | Grade 4: Number Tested | Grade 4: Percent Tested | Grade 5: Number Enrolled | Grade 5: Number Tested | Grade 5: Percent Tested | Grade 6: Number Enrolled | Grade 6: Number Tested | Grade 6: Percent Tested |
| All | 4,027 | 1,561 | 38.8 | 4,437 | 1,685 | 38.0 | 4,701 | 1,672 | 35.6 | 4,552 | 1,630 | 35.8 |
| Male | 2,800 | 1,097 | 39.2 | 3,078 | 1,158 | 37.6 | 3,199 | 1,162 | 36.3 | 3,095 | 1,130 | 36.5 |
| Female | 1,227 | 464 | 37.8 | 1,359 | 527 | 38.8 | 1,502 | 510 | 34.0 | 1,457 | 500 | 34.3 |
| Nonbinary | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| American Indian or Alaska Native | 22 | 9 | 40.9 | 20 | 9 | 45.0 | 29 | 11 | 37.9 | 29 | 17 | 58.6 |
| Asian | 397 | 127 | 32.0 | 408 | 150 | 36.8 | 404 | 129 | 31.9 | 383 | 136 | 35.5 |
| Native Hawaiian or Other Pacific Islander | 15 | 3 | 20.0 | 19 | 3 | 15.8 | 16 | 7 | 43.8 | 16 | 6 | 37.5 |
| Filipino | 103 | 32 | 31.1 | 106 | 41 | 38.7 | 116 | 40 | 34.5 | 108 | 41 | 38.0 |
| Hispanic or Latino | 2,268 | 812 | 35.8 | 2,580 | 913 | 35.4 | 2,618 | 851 | 32.5 | 2,606 | 862 | 33.1 |
| Black or African American | 297 | 91 | 30.6 | 310 | 96 | 31.0 | 408 | 121 | 29.7 | 353 | 103 | 29.2 |
| White | 705 | 386 | 54.8 | 786 | 398 | 50.6 | 888 | 414 | 46.6 | 823 | 382 | 46.4 |
| Two or more races | 220 | 101 | 45.9 | 208 | 75 | 36.1 | 222 | 99 | 44.6 | 234 | 83 | 35.5 |
| English only | 2,441 | 1,048 | 42.9 | 2,627 | 1,072 | 40.8 | 2,852 | 1,101 | 38.6 | 2,610 | 1,013 | 38.8 |
| IFEP | 40 | 15 | 37.5 | 44 | 17 | 38.6 | 40 | 18 | 45.0 | 42 | 17 | 40.5 |
| EL | 1,338 | 394 | 29.4 | 1,438 | 447 | 31.1 | 1,428 | 378 | 26.5 | 1,429 | 413 | 28.9 |
| RFEP | 207 | 104 | 50.2 | 325 | 148 | 45.5 | 377 | 174 | 46.2 | 469 | 186 | 39.7 |
| ADEL | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| To be determined | 1 | 0 | 0.0 | 2 | 1 | 50.0 | 4 | 1 | 25.0 | 2 | 1 | 50.0 |
| English proficiency unknown | 0 | 0 | N/A | 1 | 0 | 0.0 | 0 | 0 | N/A | 0 | 0 | N/A |

Table 2.A.3 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 3: Number Enrolled | Grade 3: Number Tested | Grade 3: Percent Tested | Grade 4: Number Enrolled | Grade 4: Number Tested | Grade 4: Percent Tested | Grade 5: Number Enrolled | Grade 5: Number Tested | Grade 5: Percent Tested | Grade 6: Number Enrolled | Grade 6: Number Tested | Grade 6: Percent Tested |
| Not economically disadvantaged | 1,443 | 601 | 41.6 | 1,620 | 673 | 41.5 | 1,645 | 650 | 39.5 | 1,668 | 644 | 38.6 |
| Economically disadvantaged | 2,584 | 960 | 37.2 | 2,817 | 1,012 | 35.9 | 3,056 | 1,022 | 33.4 | 2,884 | 986 | 34.2 |
| Migrant education | 24 | 12 | 50.0 | 15 | 7 | 46.7 | 24 | 12 | 50.0 | 21 | 8 | 38.1 |
| Not migrant education | 4,003 | 1,549 | 38.7 | 4,422 | 1,678 | 37.9 | 4,677 | 1,660 | 35.5 | 4,531 | 1,622 | 35.8 |
| Intellectual disability | 1,159 | 449 | 38.7 | 1,355 | 537 | 39.6 | 1,589 | 565 | 35.6 | 1,578 | 588 | 37.3 |
| Hearing impairment | 24 | 7 | 29.2 | 28 | 6 | 21.4 | 42 | 6 | 14.3 | 37 | 10 | 27.0 |
| Speech or language impairment | 96 | 44 | 45.8 | 74 | 36 | 48.6 | 53 | 29 | 54.7 | 47 | 18 | 38.3 |
| Visual impairment | 13 | 1 | 7.7 | 17 | 4 | 23.5 | 15 | 4 | 26.7 | 12 | 2 | 16.7 |
| Emotional disturbance | 11 | 6 | 54.5 | 21 | 7 | 33.3 | 21 | 10 | 47.6 | 25 | 15 | 60.0 |
| Orthopedic impairment | 104 | 29 | 27.9 | 136 | 41 | 30.1 | 165 | 37 | 22.4 | 127 | 28 | 22.0 |
| Other health impairment | 246 | 105 | 42.7 | 250 | 104 | 41.6 | 235 | 92 | 39.1 | 256 | 106 | 41.4 |
| Specific learning disability | 118 | 56 | 47.5 | 180 | 96 | 53.3 | 254 | 126 | 49.6 | 279 | 122 | 43.7 |
| Deaf–blindness | 0 | 0 | N/A | 1 | 0 | 0.0 | 2 | 2 | 100.0 | 6 | 3 | 50.0 |
| Multiple disabilities | 267 | 81 | 30.3 | 283 | 82 | 29.0 | 341 | 87 | 25.5 | 337 | 94 | 27.9 |
| Autism | 1,979 | 779 | 39.4 | 2,073 | 765 | 36.9 | 1,964 | 704 | 35.8 | 1,833 | 639 | 34.9 |
| Traumatic brain injury | 10 | 4 | 40.0 | 19 | 7 | 36.8 | 20 | 10 | 50.0 | 15 | 5 | 33.3 |

Table 2.A. CAA 2020–2021 Test-Taking Rates—Mathematics, Grades Seven, Eight, and Eleven

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 7: Number Enrolled | Grade 7: Number Tested | Grade 7: Percent Tested | Grade 8: Number Enrolled | Grade 8: Number Tested | Grade 8: Percent Tested | Grade 11: Number Enrolled | Grade 11: Number Tested | Grade 11: Percent Tested |
| All | 4,680 | 1,562 | 33.4 | 4,789 | 1,527 | 31.9 | 4,591 | 1,336 | 29.1 |
| Male | 3,088 | 1,030 | 33.4 | 3,224 | 1,044 | 32.4 | 3,062 | 907 | 29.6 |
| Female | 1,592 | 532 | 33.4 | 1,565 | 483 | 30.9 | 1,529 | 429 | 28.1 |
| Nonbinary | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| American Indian or Alaska Native | 20 | 11 | 55.0 | 24 | 10 | 41.7 | 24 | 11 | 45.8 |
| Asian | 409 | 138 | 33.7 | 392 | 129 | 32.9 | 372 | 82 | 22.0 |
| Native Hawaiian or Other Pacific Islander | 19 | 9 | 47.4 | 17 | 7 | 41.2 | 22 | 6 | 27.3 |
| Filipino | 102 | 21 | 20.6 | 118 | 39 | 33.1 | 119 | 31 | 26.1 |
| Hispanic or Latino | 2,705 | 830 | 30.7 | 2,778 | 813 | 29.3 | 2,673 | 741 | 27.7 |
| Black or African American | 348 | 103 | 29.6 | 338 | 89 | 26.3 | 325 | 81 | 24.9 |
| White | 874 | 382 | 43.7 | 941 | 373 | 39.6 | 930 | 346 | 37.2 |
| Two or more races | 203 | 68 | 33.5 | 181 | 67 | 37.0 | 126 | 38 | 30.2 |
| English only | 2,593 | 954 | 36.8 | 2,647 | 962 | 36.3 | 2,464 | 785 | 31.9 |
| IFEP | 45 | 14 | 31.1 | 36 | 9 | 25.0 | 61 | 15 | 24.6 |
| EL | 1,354 | 361 | 26.7 | 1,314 | 308 | 23.4 | 1,153 | 266 | 23.1 |
| RFEP | 688 | 233 | 33.9 | 789 | 247 | 31.3 | 913 | 270 | 29.6 |
| ADEL | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |
| To be determined | 0 | 0 | N/A | 3 | 1 | 33.3 | 0 | 0 | N/A |
| English proficiency unknown | 0 | 0 | N/A | 0 | 0 | N/A | 0 | 0 | N/A |

Table 2.A.4 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Student Group | Grade 7: Number Enrolled | Grade 7: Number Tested | Grade 7: Percent Tested | Grade 8: Number Enrolled | Grade 8: Number Tested | Grade 8: Percent Tested | Grade 11: Number Enrolled | Grade 11: Number Tested | Grade 11: Percent Tested |
| Not economically disadvantaged | 1,619 | 569 | 35.1 | 1,704 | 591 | 34.7 | 1,776 | 538 | 30.3 |
| Economically disadvantaged | 3,061 | 993 | 32.4 | 3,085 | 936 | 30.3 | 2,815 | 798 | 28.3 |
| Migrant education | 33 | 9 | 27.3 | 10 | 4 | 40.0 | 21 | 5 | 23.8 |
| Not migrant education | 4,647 | 1,553 | 33.4 | 4,779 | 1,523 | 31.9 | 4,570 | 1,331 | 29.1 |
| Intellectual disability | 1,833 | 633 | 34.5 | 1,881 | 622 | 33.1 | 1,825 | 584 | 32.0 |
| Hearing impairment | 34 | 9 | 26.5 | 32 | 10 | 31.3 | 43 | 7 | 16.3 |
| Speech or language impairment | 41 | 11 | 26.8 | 41 | 22 | 53.7 | 19 | 6 | 31.6 |
| Visual impairment | 15 | 4 | 26.7 | 21 | 1 | 4.8 | 19 | 7 | 36.8 |
| Emotional disturbance | 28 | 14 | 50.0 | 31 | 16 | 51.6 | 58 | 11 | 19.0 |
| Orthopedic impairment | 158 | 43 | 27.2 | 174 | 32 | 18.4 | 159 | 33 | 20.8 |
| Other health impairment | 245 | 91 | 37.1 | 223 | 75 | 33.6 | 202 | 61 | 30.2 |
| Specific learning disability | 260 | 116 | 44.6 | 265 | 114 | 43.0 | 317 | 113 | 35.6 |
| Deaf–blindness | 0 | 0 | N/A | 0 | 0 | N/A | 6 | 0 | N/A |
| Multiple disabilities | 333 | 91 | 27.3 | 364 | 87 | 23.9 | 335 | 83 | 24.8 |
| Autism | 1,710 | 541 | 31.6 | 1,730 | 537 | 31.0 | 1,588 | 427 | 26.9 |
| Traumatic brain injury | 23 | 9 | 39.1 | 27 | 11 | 40.7 | 20 | 4 | 20.0 |

### Appendix 2.B: Accessibility

**Note:** Some students are eligible for multiple accessibility resources. As a result, the number of students tested per grade level in table 2.B.1 through table 2.B.4 may not equal the sum of the number of students eligible per accessibility resource across all accessibility resources.

Table 2.B. Assignment of Designated Supports and Accommodations—ELA, Grades Three Through Six

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 3: N | Grade 3: % of Total Tested | Grade 4: N | Grade 4: % of Total Tested | Grade 5: N | Grade 5: % of Total Tested | Grade 6: N | Grade 6: % of Total Tested |
| Non-Embedded Accommodation—Print on Demand | 6 | 0% | 7 | 0% | 5 | 0% | 9 | 1% |
| Non-Embedded Accommodation—Alternate Response Options | 87 | 6% | 115 | 7% | 146 | 9% | 138 | 8% |
| Non-Embedded Accommodation—Read Aloud Passages | 194 | 12% | 279 | 16% | 276 | 16% | 297 | 18% |
| Non-Embedded Accommodation—Unlisted Resources | 0 | N/A | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Accommodation—Word Prediction | 13 | 1% | 20 | 1% | 37 | 2% | 30 | 2% |
| Non-Embedded Accommodation—Scribe | 71 | 4% | 112 | 7% | 119 | 7% | 137 | 8% |
| Non-Embedded Accommodation—Additional Instructional Supports for Alternate Assessments | 141 | 9% | 177 | 10% | 187 | 11% | 185 | 11% |
| Embedded Designated Support—Color Contrast | 4 | 0% | 8 | 0% | 7 | 0% | 8 | 0% |
| Embedded Designated Support—Masking | 38 | 2% | 65 | 4% | 67 | 4% | 61 | 4% |
| Embedded Designated Support—Mouse Pointer | 6 | 0% | 12 | 1% | 10 | 1% | 6 | 0% |
| Embedded Designated Support—Print Size | 12 | 1% | 15 | 1% | 26 | 2% | 23 | 1% |
| Embedded Designated Support—Permissive Mode | 8 | 1% | 12 | 1% | 22 | 1% | 10 | 1% |
| Embedded Designated Support—Streamline | 25 | 2% | 24 | 1% | 35 | 2% | 30 | 2% |
| Embedded Designated Support—Turn Off Any Universal Tool | 0 | N/A | 0 | N/A | 0 | N/A | 0 | N/A |

Table 2.B.1 *(continuation)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 3: N | Grade 3: % of Total Tested | Grade 4: N | Grade 4: % of Total Tested | Grade 5: N | Grade 5: % of Total Tested | Grade 6: N | Grade 6: % of Total Tested |
| Non-Embedded Designated Support—Amplification | 10 | 1% | 14 | 1% | 12 | 1% | 3 | 0% |
| Non-Embedded Designated Support—Color Contrast | 5 | 0% | 4 | 0% | 5 | 0% | 9 | 1% |
| Non-Embedded Designated Support—Color Overlay | 1 | 0% | 1 | 0% | 1 | 0% | 4 | 0% |
| Non-Embedded Designated Support—Magnification | 12 | 1% | 24 | 1% | 27 | 2% | 23 | 1% |
| Non-Embedded Designated Support—Medical Device | 1 | 0% | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Designated Support—Noise Buffers | 80 | 5% | 128 | 8% | 145 | 9% | 117 | 7% |
| Non-Embedded Designated Support—Read Aloud Items | 211 | 13% | 310 | 18% | 327 | 19% | 317 | 19% |
| Non-Embedded Designated Support—Scribe Items | 107 | 7% | 139 | 8% | 155 | 9% | 163 | 10% |
| Non-Embedded Designated Support—Separate Setting | 219 | 14% | 345 | 20% | 351 | 21% | 368 | 22% |
| **Total Students Tested** | **1,581** | **N/A** | **1,701** | **N/A** | **1,694** | **N/A** | **1,653** | **N/A** |

Table 2.B. Assignment of Designated Supports and Accommodations—ELA, Grades Seven, Eight, and Eleven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 7: N | Grade 7: % of Total Tested | Grade 8: N | Grade 8: % of Total Tested | Grade 11: N | Grade 11: % of Total Tested |
| Non-Embedded Accommodation—Print on Demand | 11 | 1% | 4 | 0% | 2 | 0% |
| Non-Embedded Accommodation—Alternate Response Options | 140 | 9% | 129 | 8% | 55 | 4% |
| Non-Embedded Accommodation—Read Aloud Passages | 314 | 20% | 305 | 20% | 129 | 9% |
| Non-Embedded Accommodation—Unlisted Resources | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Accommodation—Word Prediction | 24 | 2% | 23 | 1% | 26 | 2% |
| Non-Embedded Accommodation—Scribe | 136 | 9% | 120 | 8% | 26 | 2% |
| Non-Embedded Accommodation—Additional Instructional Supports for Alternate Assessments | 178 | 11% | 162 | 10% | 83 | 6% |
| Embedded Designated Support—Color Contrast | 2 | 0% | 3 | 0% | 1 | 0% |
| Embedded Designated Support—Masking | 44 | 3% | 79 | 5% | 32 | 2% |
| Embedded Designated Support—Mouse Pointer | 12 | 1% | 9 | 1% | 10 | 1% |
| Embedded Designated Support—Print Size | 31 | 2% | 31 | 2% | 18 | 1% |
| Embedded Designated Support—Permissive Mode | 20 | 1% | 12 | 1% | 9 | 1% |
| Embedded Designated Support—Streamline | 24 | 2% | 39 | 3% | 28 | 2% |
| Embedded Designated Support—Turn Off Any Universal Tool | 0 | N/A | 0 | N/A | 0 | N/A |

Table 2.B.2 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 7: N | Grade 7: % of Total Tested | Grade 8: N | Grade 8: % of Total Tested | Grade 11: N | Grade 11: % of Total Tested |
| Non-Embedded Designated Support—Amplification | 6 | 0% | 6 | 0% | 4 | 0% |
| Non-Embedded Designated Support—Color Contrast | 4 | 0% | 7 | 0% | 0 | N/A |
| Non-Embedded Designated Support—Color Overlay | 4 | 0% | 2 | 0% | 1 | 0% |
| Non-Embedded Designated Support—Magnification | 23 | 1% | 35 | 2% | 16 | 1% |
| Non-Embedded Designated Support—Medical Device | 0 | N/A | 1 | 0% | 2 | 0% |
| Non-Embedded Designated Support—Noise Buffers | 110 | 7% | 130 | 8% | 51 | 4% |
| Non-Embedded Designated Support—Read Aloud Items | 347 | 22% | 364 | 24% | 173 | 13% |
| Non-Embedded Designated Support—Scribe Items | 148 | 9% | 158 | 10% | 57 | 4% |
| Non-Embedded Designated Support—Separate Setting | 381 | 24% | 387 | 25% | 239 | 18% |
| **Total Students Tested** | **1,582** | **N/A** | **1,547** | **N/A** | **1,360** | **N/A** |

Table 2.B. Assignment of Designated Supports and Accommodations—Mathematics, Grades Three Through Six

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 3: N | Grade 3: % of Total Tested | Grade 4: N | Grade 4: % of Total Tested | Grade 5: N | Grade 5: % of Total Tested | Grade 6: N | Grade 6: % of Total Tested |
| Non-Embedded Accommodation—Print on Demand | 6 | 0% | 7 | 0% | 5 | 0% | 9 | 1% |
| Non-Embedded Accommodation—Alternate Response Options | 87 | 6% | 114 | 7% | 143 | 9% | 132 | 8% |
| Non-Embedded Accommodation—Unlisted Resources | 0 | N/A | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Accommodation—Word Prediction | 13 | 1% | 21 | 1% | 37 | 2% | 29 | 2% |
| Non-Embedded Accommodation—Additional Instructional Supports for Alternate Assessments | 141 | 9% | 174 | 10% | 185 | 11% | 180 | 11% |
| Non-Embedded Accommodation—Abacus | 9 | 1% | 6 | 0% | 15 | 1% | 13 | 1% |
| Non-Embedded Accommodation—Multiplication Table | 0 | N/A | 48 | 3% | 91 | 5% | 148 | 9% |
| Non-Embedded Accommodation—100s Number Table | 66 | 4% | 77 | 5% | 109 | 7% | 160 | 10% |
| Embedded Designated Support—Color Contrast | 4 | 0% | 8 | 0% | 7 | 0% | 8 | 0% |
| Embedded Designated Support—Masking | 38 | 2% | 63 | 4% | 68 | 4% | 60 | 4% |
| Embedded Designated Support—Mouse Pointer | 6 | 0% | 12 | 1% | 10 | 1% | 6 | 0% |
| Embedded Designated Support—Print Size | 11 | 1% | 17 | 1% | 22 | 1% | 22 | 1% |
| Embedded Designated Support—Permissive Mode | 8 | 1% | 12 | 1% | 23 | 1% | 10 | 1% |
| Embedded Designated Support—Streamline | 25 | 2% | 24 | 1% | 33 | 2% | 30 | 2% |
| Embedded Designated Support—Turn Off Any Universal Tool | 0 | N/A | 0 | N/A | 0 | N/A | 0 | N/A |

Table 2.B.3 *(continuation)*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 3: N | Grade 3: % of Total Tested | Grade 4: N | Grade 4: % of Total Tested | Grade 5: N | Grade 5: % of Total Tested | Grade 6: N | Grade 6: % of Total Tested |
| Non-Embedded Designated Support—Amplification | 10 | 1% | 14 | 1% | 12 | 1% | 3 | 0% |
| Non-Embedded Designated Support—Color Contrast | 5 | 0% | 4 | 0% | 3 | 0% | 9 | 1% |
| Non-Embedded Designated Support—Color Overlay | 1 | 0% | 1 | 0% | 1 | 0% | 4 | 0% |
| Non-Embedded Designated Support—Magnification | 12 | 1% | 24 | 1% | 27 | 2% | 23 | 1% |
| Non-Embedded Designated Support—Medical Device | 1 | 0% | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Designated Support—Noise Buffers | 80 | 5% | 130 | 8% | 143 | 9% | 118 | 7% |
| Non-Embedded Designated Support—Read Aloud Items | 210 | 13% | 309 | 18% | 327 | 20% | 315 | 19% |
| Non-Embedded Designated Support—Scribe Items | 107 | 7% | 141 | 8% | 155 | 9% | 161 | 10% |
| Non-Embedded Designated Support—Separate Setting | 219 | 14% | 345 | 20% | 351 | 21% | 364 | 22% |
| **Total Students Tested** | **1,561** | **N/A** | **1,685** | **N/A** | **1,672** | **N/A** | **1,630** | **N/A** |

Table 2.B. Assignment of Designated Supports and Accommodations—Mathematics, Grades Seven, Eight, and Eleven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 7: N | Grade 7: % of Total Tested | Grade 8: N | Grade 8: % of Total Tested | Grade 11: N | Grade 11: % of Total Tested |
| Non-Embedded Accommodation—Print on Demand | 10 | 1% | 4 | 0% | 3 | 0% |
| Non-Embedded Accommodation—Alternate Response Options | 138 | 9% | 127 | 8% | 53 | 4% |
| Non-Embedded Accommodation—Unlisted Resources | 0 | N/A | 0 | N/A | 0 | N/A |
| Non-Embedded Accommodation—Word Prediction | 23 | 1% | 24 | 2% | 26 | 2% |
| Non-Embedded Accommodation—Additional Instructional Supports for Alternate Assessments | 172 | 11% | 161 | 11% | 80 | 6% |
| Non-Embedded Accommodation—Abacus | 11 | 1% | 12 | 1% | 3 | 0% |
| Non-Embedded Accommodation—Multiplication Table | 161 | 10% | 190 | 12% | 79 | 6% |
| Non-Embedded Accommodation—100s Number Table | 181 | 12% | 157 | 10% | 41 | 3% |
| Embedded Designated Support—Color Contrast | 2 | 0% | 3 | 0% | 1 | 0% |
| Embedded Designated Support—Masking | 42 | 3% | 79 | 5% | 31 | 2% |
| Embedded Designated Support—Mouse Pointer | 12 | 1% | 9 | 1% | 10 | 1% |
| Embedded Designated Support—Print Size | 30 | 2% | 31 | 2% | 17 | 1% |
| Embedded Designated Support—Permissive Mode | 20 | 1% | 11 | 1% | 10 | 1% |
| Embedded Designated Support—Streamline | 24 | 2% | 38 | 2% | 27 | 2% |
| Embedded Designated Support—Turn Off Any Universal Tool | 0 | N/A | 0 | N/A | 0 | N/A |

Table 2.B.4 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Accessibility Resource | Grade 7: N | Grade 7: % of Total Tested | Grade 8: N | Grade 8: % of Total Tested | Grade 11: N | Grade 11: % of Total Tested |
| Non-Embedded Designated Support—Amplification | 6 | 0% | 6 | 0% | 4 | 0% |
| Non-Embedded Designated Support—Color Contrast | 4 | 0% | 7 | 0% | 0 | N/A |
| Non-Embedded Designated Support—Color Overlay | 4 | 0% | 2 | 0% | 1 | 0% |
| Non-Embedded Designated Support—Magnification | 23 | 1% | 36 | 2% | 16 | 1% |
| Non-Embedded Designated Support—Medical Device | 0 | N/A | 1 | 0% | 2 | 0% |
| Non-Embedded Designated Support—Noise Buffers | 107 | 7% | 126 | 8% | 50 | 4% |
| Non-Embedded Designated Support—Read Aloud Items | 332 | 21% | 361 | 24% | 169 | 13% |
| Non-Embedded Designated Support—Scribe Items | 144 | 9% | 157 | 10% | 57 | 4% |
| Non-Embedded Designated Support—Separate Setting | 371 | 24% | 387 | 25% | 235 | 18% |
| **Total Students Tested** | **1,562** | **N/A** | **1,527** | **N/A** | **1,336** | **N/A** |

## Item Development and Review

This chapter provides a brief overview of each process implemented by ETS and the relevant associated specifications used to develop items for use on the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics. These processes include those that are entirely internal to ETS and those that are conducted in coordination with the California Department of Education (CDE), Cambium Assessment, Inc., or both.

More details about the specifications and the analyses associated with each process are described in other chapters that are referenced in the subsections that follow.

### Item Development and Review

#### Overview

Each item in the CAAs for ELA and mathematics was developed through a comprehensive cycle and designed to conform to principles of item writing defined by ETS. Each item in the CAA operational item bank was developed to measure a specific Core Content Connector (Connector) or the essential understanding (EU) of a Connector derived from the Common Core State Standards (CCSS). In addition, guidelines for style, fairness, and bias and sensitivity helped item developers and reviewers ensure consistency across the item development process.

#### Item Specifications

ETS maintains item development specifications for the CAAs in ELA and mathematics. These specifications describe the characteristics of the items that should be written to measure each content standard and help ensure that all items developed for the CAAs measure the content standards consistently. Item writing emphasis was determined in consultation with the CDE.

The specifications include

* a full statement of each CCSS, Connector, and EU;
* a description of the item guidelines expected by tier for each standard;
* sample item stems for some standards;
* a general list of elements to avoid (e.g., for mathematics, the use of certain variables such as m and n in the same item, which can be difficult for students with visual impairment to distinguish);
* a description of the kinds of item stems, formats, or both stems and formats appropriate to assess each standard;
* a description of appropriate data representations (such as charts, tables, graphs, or other illustrations);
* the content limits of the standard (such as one or two variables, maximum place values of numbers);
* a description of appropriate reading passages, if applicable; and
* for ELA, guidelines for passages used to assess reading comprehension, including
* a list of topics to be avoided,
* text complexity guidelines and suggested reading levels,
* the acceptable ranges for the number of words in a passage, and
* expected use of artwork.

#### Item Format

CAA items were designed to engage the target population. ELA and mathematics items were developed with the understanding that a test examiner delivers each item individually to a tested student and assists the student in navigating through the test and recording the answer to each item. Note that item responses themselves must come from the student and not from prompting by the test examiner.

Students who were able could select responses using a mouse, touchscreen, or other supported input device. In some cases, students needed to use other modes of communication, such as eye gaze or gesture, to indicate responses to the test examiner. The test examiner entered these responses into the testing device for the student.

The majority of items were presented in a split-screen format, with a “stimulus” on the left side of the screen and the item to be answered on the right. For ELA items, the stimulus was usually a passage. For mathematics items, the stimulus was item-specific information or general mathematical knowledge. A selected number of items had a multimedia stimulus, either a short audio file, a video, an animation, or, for students with a visual impairment, alternative text read by the test examiner.

Items developed for the CAAs for ELA and mathematics could be scored as being worth one point or two points.

#### Item Types

Each Connector or EU could be assessed through one or more of the available item types presented in table 3.1. Note that, in this table, an asterisk (\*) indicates technology-enhanced items.

Table 3.1 CAA Item Types

|  |  |  |
| --- | --- | --- |
| Response Type | Item Type | Description |
| Multiple choice (MC) single select | MC | The item generally consists of a stem and list of choices; the test taker can select only one choice to respond. This may also include a stimulus. |
| MC multiple select | MC | The item generally consists of a stem and list of choices; the test taker can select two or more choices to respond. This may also include a stimulus. |
| Inline choice list single select | MC | The stem contains a single blank; the test taker must fill in the blank by selecting a choice from its corresponding choice list. |

Table 3.1 *(continuation one)*

|  |  |  |
| --- | --- | --- |
| Response Type | Item Type | Description |
| Inline choice list multiple select | MC | The stem contains two or more blanks; the test taker must fill in each blank by selecting a choice from the corresponding choice lists. |
| Numeric | Short Constructed Response (CR) | The test taker responds by filling in a single entry box with a numeric value. The entry box may be standalone, in line with text, or displayed on top of an image. |
| Grid single select\* | MC | The test taker responds by marking a single cell in a table grid. |
| Zone single select\* | Hot Spot | This is an item where the answer choices are predefined “hotspots” on an image. When the test taker selects (clicks) on the spot, the selection is highlighted, shaded, or outlined in red. The test taker selects one zone to respond. |
| Zone multiple select\* | Hot Spot | This is an item where the answer choices are predefined “hotspots” on an image. When the test taker selects (clicks) on the spot, the selection is highlighted, shaded, or outlined in red. The test taker selects two or more zones to respond. |
| Match single select\* | Drag & Drop | The test taker responds by dragging and dropping a single choice (“source”) into the appropriate location (“target”).  There are four main varieties of this item type:   1. Target Table—text-based sources with targets arranged in table structure 2. Target Passage—text-based sources with targets arranged in paragraphs of text 3. Target Positions—text-based sources with targets arranged on top of an image 4. Image Map—image-based sources with both sources and targets arranged on top of an image |

Table 3.1 *(continuation two)*

|  |  |  |
| --- | --- | --- |
| Response Type | Item Type | Description |
| Match multiple select\* | Drag & Drop | The test taker responds by dragging and dropping two or more choices (“sources”) into the appropriate locations (“targets”).  There are four main varieties:   1. Target Table—text-based sources with targets arranged in table structure 2. Target Passage—text-based sources with targets arranged in paragraphs of text 3. Target Positions—text-based sources with targets arranged on top of an image 4. Image Map—image-based sources with both sources and targets arranged on top of an image   These varieties allow for the following scenarios:   * Exact matching (i.e., ordering) * Sources correctly placed in multiple different targets * Reuse sources * Reuse targets * Partial scoring |
| Bar graph single select\* | Short CR | The test taker responds by manipulating a single bar on a graph. Bars can be solid or consist of stacked icons (e.g., dollar signs representing money, stick figures representing people, etc.). Bars can be horizontally or vertically oriented. |
| Bar graph multiple select\* | Short CR | The test taker responds by manipulating two or more bars on a graph. Bars can be solid or consist of stacked icons (e.g., dollar signs representing money, stick figures representing people, etc.). Bars can be horizontally or vertically oriented. |
| Composite | Composite Objective | Interactions vary depending on which item types were associated. Keys vary depending on which item types were associated. |

#### Recruitment and Selection of Item Writers

The items for the CAAs for ELA and mathematics were written by individual item writers with a thorough understanding of the Connectors and EUs. Applications for item writing were screened by senior ETS content staff. Only those with strong content and teaching backgrounds were approved for inclusion in the training program for item writing. Most item-writing participants were current or former California educators who were particularly knowledgeable about the standards assessed by the CAAs for ELA and mathematics and experienced with the test-taking population.

All item writers met the following minimum qualifications:

* Possession of a bachelor’s degree in the relevant content area or in the field of education with special focus on a particular content area (An advanced degree in the relevant content was desirable.)
* Current teaching experience in California, when possible, especially experience teaching students with cognitive disabilities
* Previous experience or training in writing items for standards-based assessments, including knowledge of the many considerations that are important when developing items for special student populations
* Previous experience or training in writing items in the content areas covered by CAA grade levels, content areas, or both
* Familiarity with, and understanding and support of, the Connectors

### ETS Item Review Process

Items developed for the CAAs for ELA and mathematics underwent an extensive item review process designed to provide the best standards-based assessments possible. This subsection summarizes the ongoing item review process that ensures the quality of CAA items.

#### Overview

Item writer submissions were reviewed carefully by ETS assessment specialists, who determined whether or not each item met the criteria expected for submission, including accuracy and adherence to the item specifications. Items that did not meet minimal criteria were rejected, with notes for future revision submitted to authors. Items that met the criteria were accepted into the pool and authored into the system.

Once an item was accepted for authoring—that is, once it had been entered into ETS’ item bank and formatted for use in an assessment—ETS employed a series of internal reviews. These reviews used established criteria to judge the quality of item content and ensured that each item measured what it was intended to measure. These internal reviews also examined the overall quality of the test items before presentation to the CDE and California educators.

The ETS review process for the CAAs included the following; these tasks are described in the next subsections:

1. Content review
2. Accessibility review
3. Editorial review
4. Sensitivity and fairness review

Throughout this multistep item review process, the lead content-area assessment specialists and development team members continually evaluated the items in adherence to the rules for item development.

#### ETS Content Review

During the development cycle, items and stimuli underwent three reviews by content-area assessment specialists. These assessment specialists ensured thatthe items and stimuli were in compliance with ETS’ written guidelines for clarity, style, accuracy, and appropriateness for California students as well as with the approved item specifications, the *CAASPP and ELPAC Item Review Acceptance Criteria* (ETS, 2019), and other ETS-produced guidelines for clarity, style, accuracy, and appropriateness for California students. Assessment specialists reviewed each item in terms of the following characteristics:

* Relevance to the purpose of the test
* Match to the item specifications, including the level of item complexity
* Match to the principles of quality item writing
* Match to the identified standard or standards
* Difficulty
* Accuracy of the content
* Readability
* Grade-level appropriateness
* Appropriateness of any illustrations, graphs, or figures

Each item was classified with the Connector, EU, or Connector and EU it was intended to measure. The assessment specialists checked each item against its classification codes, both to evaluate the correctness of the classification and to ensure that the task posed by the item was relevant to the outcome it was intended to measure. The reviewers could accept the item and classification as written, suggest revisions, or recommend that the item be discarded. These steps occurred prior to the CDE’s review.

#### ETS Accessibility Review

The structure of the CAAs for ELA and mathematics allows a test examiner to administer the assessment to the student one-on-one, which gives test examiners an opportunity to use any support that improves the student’s accessibility to the assessment. Therefore, ETS did not conduct a separate accessibility review for the CAAs for ELA and mathematics outside of the review described in subsection [*3.2.2 ETS Content Review*](#_ETS_Content_Review). However, the ETS Accessible Content & Inclusive Solutions team did advise on alternative text appropriateness and accessibility of items and item types during the ETS content review.

#### ETS Editorial Review

After the content-area assessment specialists reviewed each item, a group of specially trained editors also reviewed each item in preparation for consideration by the CDE and California educators. The editors checked items for clarity, correctness of language, appropriateness of language for the grade level assessed, adherence to the style guidelines, and conformity with accepted item-writing practices.

#### ETS Sensitivity and Fairness Review

ETS assessment specialists who are specially trained to identify and edit or eliminate questions that contain content or wording that could be construed to be offensive to, or biased against, members of specific ethnic, racial, or gender groups conducted the next level of review. These trained staff members reviewed every item before the CDE and formal item reviews.

The review process promoted a general awareness of, and responsiveness to, the following:

* Diversity of background, cultural tradition, and viewpoints to be found in the test-taking population
* Changing roles and attitudes toward various groups
* Role of language in setting and changing attitudes toward various groups
* Topics that may be unsettling or otherwise distract the student from the content being measured, such as natural disasters, disease, or family discord
* Contributions of diverse groups (including ethnic and minority groups, individuals with disabilities, and women) to the history and culture of the United States and the achievements of individuals within these groups
* Item accessibility for English learner (EL) students

### California Department of Education Review

After ETS reviews of items were completed, the items were reviewed by the CDE content teams. CDE content experts reviewed the items using the same criteria used in the ETS reviews. After CDE reviews occurred, ETS made edits to the items based on the CDE feedback, and the items were then finalized for item review meetings with California educators.

### California Educator Review

Item review meetings with California educators were held at the end of the item review process as the final content expert review that items must undergo before being placed in an operational assessment.

#### California Educators as Content Experts

California educators filled an advisory role to the CDE and ETS and provided guidance on matters related to item development for the CAAs for ELA and mathematics. Both meetings—one each for ELA and mathematics—took place virtually from May 19 through May 21, 2020, and were facilitated by ETS content experts. Ten to 12 educators attended each meeting.

In the meetings, the item content, test examiner directions, and alternative text were presented, and ETS facilitated a discussion with the educators for each item using the *CAASPP ELPAC Item Review Acceptance Criteria* (CDE, 2019). The educators were responsible for reviewing all newly developed items for alignment to the California content standards. Meeting participants also reviewed the items for content accuracy, language clarity, and item quality. In their examination of test items, participants could raise concerns about the appropriateness of the items as related to the grade, age, and cognitive level of the test taker. Additionally, items were evaluated for any potential bias or sensitivity concerns associated with disability, gender, race, ethnicity, religion, or socioeconomic status. ETS recorded educator feedback for each item and adjusted item content based on approval from the CDE.

#### Composition of Item Review Panels

For the last item review meeting, the group of participating California educators consisted of current and former teachers (some of whom had taught students eligible to take the CAAs and others who were subject-matter experts), resource specialists, administrators, curriculum and content experts, and other education professionals. Minimum qualifications to be invited to participate were

* three or more years of teaching experience in kindergarten through grade twelve and in the relevant content area (ELA or mathematics),
* bachelor’s or higher degree in a grade or content area related to ELA or mathematics, and
* knowledge and experience with the California content standards in ELA or mathematics.

Preferred qualifications included

* a special education credential,
* experience teaching students with more than one type of disability, and
* three to five years of experience as a special education teacher or school administrator with a special education credential.

School administrators; local educational agency (LEA), county content, or program specialists; or university educators had to meet the following qualifications to be invited to participate:

* Three or more years of experience as a school administrator; LEA, county content, or program specialist; or university instructor in a grade-specific area
* Bachelor’s or higher degree in a grade-specific area
* Knowledge of, and experience with, the California content standards in ELA or mathematics

Every effort was made to ensure that groups of item reviewers included a wide representation of gender, geographic regions, and ethnic groups in California. Efforts also were made to ensure representation by members with experience serving California’s diverse special education population.

Table 3.2 shows the educational qualifications, present occupation, and credentials of the individuals who participated in CAA item review.

Table 3.2 CAA Item Reviewer Qualifications by Content Area and Total

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Qualification Type** | **Qualification** | **ELA** | **Math** | **Total** |
| **Occupation** | Special Education Teacher | 5 | 7 | 12 |
| **Occupation** | Educational Specialist | 5 | 3 | 8 |
| **Occupation** | General Education Teacher | 1 | 1 | 2 |
| **Highest Degree Earned** | Bachelor’s Degree | 8 | 8 | 16 |
| **Highest Degree Earned** | Master’s Degree | 3 | 1 | 4 |
| **Highest Degree Earned** | Doctorate | 0 | 2 | 2 |
| **K–12 Teaching Credential** | Elementary Teaching (multiple subjects) | 5 | 6 | 11 |
| **K–12 Teaching Credential** | Secondary Teaching (single subject) | 0 | 0 | 0 |
| **K–12 Teaching Credential** | Special Education | 4 | 5 | 9 |
| **K–12 Teaching Credential** | Reading Specialist | 0 | 0 | 0 |
| **K–12 Teaching Credential** | EL (Crosscultural, Language and Academic Development; Bilingual, Crosscultural, Language and Academic Development) | 2 | 0 | 2 |
| **K–12 Teaching Credential** | Administrative | 0 | 0 | 0 |
| **K–12 Teaching Credential** | Other | 0 | 0 | 0 |

**Note:** Numbers may not match the totals because item reviewers may have multiple occupations or teaching credentials or are currently working toward earning their highest degree.

Item reviewers were recruited through an application process. Recommendations were solicited from LEAs and county offices of education as well as from the CDE. Applications were reviewed by ETS assessment directors, who confirmed that an applicant’s qualifications met the specified criteria. Applicants who met the criteria had their information forwarded to the CDE for further review and agreement before invitations to participate were distributed.

#### Meetings for Review of CAAs for ELA and Mathematics Items

ETS content-area assessment specialists facilitated the CAAs for ELA and mathematics item review meetings. Each meeting began with a brief training session on how to review items. ETS provided this training, which consisted of the following topics:

* Overview of the purpose and scope of the CAA
* Overview of the CAA test design specifications and blueprints
* Analysis of the CAA item specifications
* Overview of criteria for evaluating test items
* Review and evaluation of items for bias and sensitivity issues

The criteria for evaluating items included the following:

* Overall technical quality
* Match to the Connectors
* Match to the construct being assessed by the standard
* Difficulty range
* Clarity
* Correctness of the answer
* Plausibility of the distractors
* Bias and sensitivity factors

Criteria also encompassed more global factors, including the quality of the alternative text—that it describes an image in an age- and audience-appropriate manner within the context of the question—and, for ELA, the appropriateness, difficulty, and readability of reading passages. Meeting participants were also trained on how to make recommendations for revising items.

Guidelines for reviewing items were provided by ETS and approved by the CDE. The set of guidelines for reviewing items is summarized next:

* Does the item
* have one, and only one, clearly correct answer for single-select items?
* measure the content standard?
* match the test item specifications?
* align with the construct being measured?
* test worthwhile concepts or information?
* Is the stimulus, if any, for the item
* required to answer the item?
* likely to be interesting to students?
* clearly and correctly labeled?
* providing all the information needed to answer the item?

### Data Review

No data review meeting was held after the 2020–2021 CAAs administration; a sample representative of the target population could not be formed because, due to the novel coronavirus disease 2019 pandemic, an insufficient number of students completed an assessment during the administration. Typically, after items are administered to students, ETS prepares the items and the associated statistics for review by the CDE and California educators.

In previous data review meetings for the CAAs for ELA and mathematics, review materials included items with their statistical data and statistical flags based on the respective administration’s item analyses along with annotated comment sheets for use by reviewers. ETS typically conducts an introductory training to highlight any new issues and to serve as a statistical refresher. Reviewers then make decisions about which items should be included in the item bank for future assembly. If an item is considered problematic and not to be included in the item bank, it could be revised, field-tested once again, and put through another round of item analysis, or the item could be deactivated and removed from the item bank. ETS psychometric and content staff are available to reviewers throughout this process.

ETS content staff facilitate the meeting, confirming that all educators weigh in on each flagged item to confirm whether there were any concerns, from a content perspective, as it pertained to the flag. ETS psychometricians provide training on the item statistics and respond to questions about the item statistics during the item discussion. The data review meeting participants review the content and statistics of each item and then make a recommendation to accept or reject an item.

Content staff record the participants’ recommendations and comments regarding the flagged items. The feedback is referenced when working with the CDE to reconcile educator feedback and to make a final decision on whether to include the item in the operational pool.

### Reference

Educational Testing Service. (2019). *CAASPP and ELPAC item acceptance criteria*. [Unpublished manuscript]. Princeton, NJ: Educational Testing Service.

## Test Assembly

This chapter provides details of test assembly, including a description of the content being measured (i.e., test blueprints), the design of the multistage test (MST), and routing rules that guide students from Stage 1 to modules of Stage 2. The process of item selection, final reviews before test production, and the production process (e.g., preparation of the test forms for computer-based test delivery) also are included.

### Test Content Specifications and Test Blueprints

The California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics incorporate innovations and best practices from recent national alternate assessment initiatives, including the National Center and State Collaborative (NCSC) and the Dynamic Learning Maps. All items and tasks are developed to grade-level standards and the Core Content Connectors (Connectors) developed by the NCSC (NCSC, 2014a [reading], 2014b [writing], and 2014c [mathematics]). An essential understanding (EU) is identified for each Connector. EUs define a basic, foundational key idea or concept based on the Connector that builds increasing understanding of the grade-level content.

These Connectors are aligned with the Common Core State Standards (CCSS).

#### Test Content Specifications

The CAA assesses each CCSS through the NCSC-developed Connectors and EUs derived from the Connectors. These Connectors identify the most salient grade-level, core academic content in ELA and mathematics found in both the CCSS (CCSS Initiative, 2019) and the Learning Progression Frameworks (LPF) (NCSC, 2015), and illustrate the necessary knowledge and skills required to reach the learning targets within the LPF and the CCSS. Additionally, the Connectors focus on the core content, knowledge, and skills needed to help students at each grade level succeed; and identify priorities in each content area to guide the instruction for students in this population and for an alternate assessment. Finally, Connectors provide a foundation that permits teachers, parents/‌guardians, and the students themselves to help students with significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school ready for postsecondary options (NCSC, 2015).

Each content standard is assessed through the Connectors and related EUs under a three-tier structure of item complexity. Detailed information on the tiered items is provided in section [*4.2 Test Design*](#_Test_Design).

#### Test Blueprints

The CAA test blueprints are unique to each grade level and content area (California Department of Education [CDE], 2015a [ELA] and 2015b [mathematics]). These blueprints designate the breakdown of each assessment, first by content category (for ELA) or domain (for mathematics) and then by Connectors. Information on a test blueprint for a given grade and content area includes the

* specific ratio of each content category and domain on the overall test,
* specific Connectors to be assessed,
* specific EUs to be assessed, and
* maximum number of items on a test.

A summary of blueprint alignment for the 2020–2021 forms is presented in table 4.1, which shows the absolute percentage differences of items per content domain for each test between the 2020–2021 form and the test blueprint.

Table 4.1 Absolute Percentage Differences of Items per Content or Domain for the 2020–‍2021 Administration

|  |  |  |
| --- | --- | --- |
| 2020–2021 | Router + Easy | Router + Hard |
| ELA 3 | 1%–2% | 1%–2% |
| ELA 4 | 1%–3% | 1%–3% |
| ELA 5 | 2%–2% | 2%–2% |
| ELA 6 | 0%–2% | 0%–2% |
| ELA 7 | 0%–2% | 0%–2% |
| ELA 8 | 0%–2% | 0%–2% |
| ELA 11 | 1%–2% | 1%–2% |
| Mathematics 3 | 0%–2% | 0%–2% |
| Mathematics 4 | 1%–3% | 1%–3% |
| Mathematics 5 | 0%–2% | 0%–2% |
| Mathematics 6 | 0%–2% | 0%–2% |
| Mathematics 7 | 0%–3% | 0%–3% |
| Mathematics 8 | 2%–3% | 1%–2% |
| Mathematics 11 | 0%–2% | 0%–3% |

More information regarding the alignment of each CAAs for ELA and mathematics test with the test blueprints is provided in table 4.A.1 through table 4.A.14 in [appendix 4.A](#_Appendix_4.A:_Test). Similar information for the 2015–2016, 2016–2017, and 2017–2018 forms is provided in table 4.A.15 through table 4.A.17. Information for the 2018–2019 and 2019–2020 forms is identical to that of the 2020–2021 forms, as the three sets of forms share the same operational items.

Overall, the percentages of items per content domain based on the Connector assigned during item development and those in the CAA blueprint are comparable—differences are less than 4 percent—for all grades in the 2020–2021 administration and stands as an improvement over the 2017–2018 administration, where one difference was approximately 10 percent.

### Test Design

#### Multistage Test Design

As the simplest and most robust form of adaptive testing, an MST design consists of a number of modules. Each module can be assembled to meet a set of specifications such as item content and item difficulty and complexity; refer to subsection [*3.1.2 Item Specifications*](#_Item_Specifications) for additional information about the item specifications.

ETS employs a two-stage MST design for the CAAs for ELA and mathematics. Students at different ability levels, based on their performance on Stage 1, are routed to one of two alternative modules at Stage 2 that is appropriate for their abilities.

This design improves measurement quality and student engagement, particularly for students who represent a diverse population with a wide range of ability levels and whose ability levels may not be appropriately targeted by conventional fixed-form tests. It allows test developers to develop thoughtful test item sets (modules) that maximize the information provided about a student by routing students to test modules appropriate for their ability levels. Compared with the fixed-form tests, the MST design provides a better balance between test standardization and individual customization.

The CAAs for ELA and mathematics test assembly design meets content and psychometric requirements for items and forms. The design contains a number of important features that are described in the following subsections.

##### Tiered Items

An important feature of the CAAs for ELA and mathematics MST is the usage of tiered items. Given that the target population encompasses many types of cognitive disabilities and an extremely wide range of abilities, items developed to three tiers of complexity are organized in order of increasing complexity and cognitive load. Items developed at Tier 1, considered the most accessible level, typically rely heavily on graphics. Items developed at Tier 2, considered the middle level, typically use a mix of graphics and text. Items developed at Tier 3, which is considered the most challenging level (with increased rigor and difficulty), rely more on text and less on graphics than the lower tiers. Typically,

* a Tier 1 item would provide images with dichotomous answer choices,
* a Tier 2 item would provide three answer choices with fewer images, and
* a Tier 3 item would provide three or more answer choices with more complicated text and the fewest images.

As the text complexity increases for higher tier levels, the lengths of passages in an ELA assessment also increase. Within the same grade level, relatively speaking, a Tier 1 ELA passage contains few sentences with heavy use of graphics. A Tier 2 passage typically contains several sentences with fewer graphics. A Tier 3 passage contains a paragraph or two of text with less reliance on graphics.

Beginning in the 2017–2018 development cycle, CAAs for ELA and mathematics item specifications were updated to reflect a desire for lower language complexity in these CAA content areas. The rationale behind the request was to make the items more accessible to this population. ETS made efforts to ensure that complexity was reflected in the rigor of the tasks and not in the wording and sentence structure of the item. This was achieved by reducing the amount of the text in items, as well as eliminating high-vocabulary words. These lower text-complexity items were used as embedded field test items and in the Stage 2 modules as items without statistics.

##### Modules

Items and passages from each tier were carefully assembled into modules for both stages of CAAs for ELA and mathematics delivery. The Stage 1 module consisted of a total of 14 items, of which 10 were operational items and four were embedded field test items. The operational portion of the Stage 1 module was the router with four Tier 1 items appearing first, followed by a combination of either two or three Tier 1 items and either three or four Tier 2 items. Five versions of the Stage 1 module were administered; they differed only in regard to the embedded field test items. Thus, each Stage 1 module version had the same operational items but different embedded field test items.

The five versions of the Stage 1 modules were randomly assigned at the local educational agency (LEA) level, statewide (except for the four largest LEAs [Long Beach Unified, Los Angeles Unified, San Diego Unified, and San Francisco Unified]), during computer-based administration. Within the four largest LEAs, the five versions were randomly assigned at the school level.

In addition, the Stage 1 router was divided into two sections, Stage 1A and Stage 1B, where Stage 1A consisted of the first four operational items, all at Tier 1. Stage 1A was the Student Response Check (SRC), whereby a student’s testing experience could end if the student could not orient successfully or provide a consistent response to any of the easiest items administered. Stage 1B consisted of the remaining six operational items, which included either two or three Tier 1 items and either three or four Tier 2 items. Refer to subsection [*4.2.2 English Language Arts/Literacy and Mathematics Test Design*](#_English_Language_Arts/Literacy) for more information.

At Stage 2, each of the two modules—easy and hard—was tailored to a particular student ability level with appropriate item sets. Each Stage 2 module consisted of 15 items. Items at Stage 1 or Stage 2 were eligible for use as anchor items in postequating to link all operational items without prior statistics and embedded field test items on the baseline scale.

##### Embedded Field Test

Embedded field testing is a preferred method for building an item bank because the items are administered within an operational test setting. The field test items are not counted toward student scores. For the 2020–2021 CAAs for ELA and mathematics administration, four field test items were embedded at Stage 1. Scores from these items were not included in routing decisions from Stage 1 to Stage 2.

For the CAA Stage 1 router, one core module was administered with 10 operational items that were common across five versions that supported five different embedded field test sets of four items each. The five versions of Stage 1 modules were distributed by random assignment at the LEA level—with the exception of the four largest LEAs, for which the versions were distributed by random assignment at the school level—so that a large representative sample of students responded to the field test items embedded in these versions. The random assignment of specific versions ensured that a diverse sample of students took each field test set. The students did not know which items were being field-tested and which items were operational; therefore, their motivation was not expected to differ over the two types of items (Patrick & Way, 2008).

##### Pathways

The Stage 1 and Stage 2 module combination administered to any one student is called a “pathway.” The pathway varies depending on a student’s performance on the items and the routing rules. The two-stage MST design with the Stage 1 router and two modules at Stage 2 generated three possible pathways, including an early exit pathway, defined by a student’s exit from the test after Stage 1.

The three possible pathways can be regarded as multiple forms of a linear test. Each MST pathway combination of the Stage 1 and Stage 2 modules is shown in table 4.2.5F[[5]](#footnote-6)

Table 4.2 Three Effective Unique Forms for Each Grade and Test Configuration

|  |  |  |
| --- | --- | --- |
| Pathway | Effective Unique Form | Configuration |
| 1 | ABO | Stage 1 items and end the test |
| 2 | ABE | Stage 1 items and Stage 2 easy items |
| 3 | ABH | Stage 1 items and Stage 2 hard items |

#### English Language Arts/Literacy and Mathematics Test Design

For the 2020–2021 CAA administration in ELA and mathematics, most students were required to complete a full-length test: the routing test in Stage 1A and Stage 1B, as well as one of the two modules in Stage 2.

The CAAs for ELA and mathematics are designed as follows:

1. Stage 1
2. SRC with the four easiest Tier 1 items; router Stage 1A
3. Two or three Tier 1 items, three or four Tier 2 items, and four embedded field test items; router Stage 1B
4. Stage 2
5. Module 1—Easy

15 operational items

* Seven or eight Tier 1 items
* Four or five Tier 2 items
* Three Tier 3 items

1. Module 2—Hard

15 operational items

* Three Tier 1 items
* Four or five Tier 2 items
* Seven or eight Tier 3 items

##### Stage 1 Design

Stage 1A comprised the SRC, which consisted of the four easiest Tier 1 items based on the item response theory (IRT) *b*-parameter values. For students who did not provide observable and reasonable responses to the items, test examiners were directed to end the assessment using the [**End Test**] button. These checks occurred at the first item and the fourth item. The responsibilities of test examiners regarding these checks can be found in section[*5.1 Test Administration*](#_Test_Administration_1)in [*Chapter 5: Test Administration*](#_Test_Administration).

Stage 1B consisted of six additional operational items. After the last item of Stage 1, the results from the router were used to identify students for whom meaningful measurement was unlikely to occur. These students were exited from the test instead of proceeding to Stage 2. Continuing students were routed to one of the two Stage 2 modules. Refer to subsection [*7.1.1 Scoring of Incomplete Cases*](#_Incomplete_and_Complete)for the scoring of each situation described previously.

##### Stage 2 Design

At Stage 2, the two modules were defined as Module 1 (Easy) or Module 2 (Hard). Module 1 consisted of approximately seven or eight Tier 1 items, four or five Tier 2 items, and three Tier 3 items. Module 2 consisted of approximately three Tier 1 items, four or five Tier 2 items, and seven or eight Tier 3 items. Students were routed to one of the two modules of Stage 2 based on their performance on the Stage 1 router.

#### Routing Rules for the 2020–2021 Administration

Given that the CAA-eligible population consists of students with a wide range of cognitive disabilities, routing rules are used to minimize the test-taking burden on students, in addition to directing students to the modules that fit their ability levels. Students experiencing difficulties with the simplest tasks should not continue with more complex items. Each student should be routed to a module that is appropriate for the student’s ability level.

The routing rules for the 2020–2021 CAAs for ELA and mathematics administration are presented in table 4.3. The early exit routing rule is designed for students who demonstrate the ability to communicate and provide responses but have significant difficulties successfully completing Tier 1 items. The first threshold, *t1*, based on the student’s performance on the router portion of Stage 1, determines whether a student will end the test early or continue to one of the two Stage 2 modules. The intent is to end the test early for those students who are most likely to find the second-stage testing more stressful than productive or are otherwise unable to engage with the content. For those students who continue to Stage 2, the remaining threshold (*t2*) determines which of the available pathways will be taken.

Table 4.3 Routing Rule Summary for the 2020–2021 Administration

|  |  |
| --- | --- |
| Condition | Decision |
| Router score is less than *t1*. | End the test after Stage 1. |
| Router score is greater than or equal to *t1*and less than *t2*. | Continue the test with Module 1 in Stage 2. |
| Router score is greater than or equal to *t2*. | Continue the test with Module 2 in Stage 2. |

The routing thresholds were determined through a simulation using the 2017–2018 CAAs for ELA and mathematics administration data. In this simulation, student ability distributions were estimated for each grade level and content area. Observed ability estimates for all scored students were tabulated and then smoothed through kernel smoothing methods (ETS, 2011). The IRT item parameters used for the simulation evaluation were estimated from the 2015–2016, 2016–2017, or 2017–2018 administration. If statistics for more than one administration were available, then the most recent statistics were used.

Each simulated student was administered all items in the full MST, including the router portion of Stage 1 and both of the two Stage 2 modules. Following the simulation of each test, aggregated results across all the simulated students were collected, including the true ability, the score on the router portion of Stage 1, and the overall score across all modules in the full MST (a total of 40 items). For the current assessment, an ideal set of threshold values was chosen to maximize the test reliability, proportion of productive tests, and test information function by ensuring that each student was routed to the most informative Stage 2 module. The final thresholds of routing were determined in consultation with the CDE.

The raw score point values in the router portion of Stage 1 were used by the routing engine in the test delivery system (TDS) to determine routing pathways for students. The router included both 1-point and 2-point items, and the router score was the sum of item scores from the 10 operational items in the router. For example, the maximum score points for the Stage 1 for grade three ELA was 15. If a student earned fewer than 3 score points, the student’s testing experience ended. If a student earned at least 3 but fewer than 11 score points, the student was routed to the easy Stage 2 module. When a student earned 11 or more score points, the student was routed to the hard Stage 2 module. A summary of the routing thresholds is presented in table 4.C.1 (ELA) and table 4.C.2 (mathematics) in [appendix 4.C](#_Appendix_4.C:_Routing).

### Test Production Process

The operational test forms from the 2018–2019 administration of the CAAs were reused during both the 2019–2020 and 2020–2021 administrations. The test production process is typically performed for each administration of the CAAs but was not performed for the 2020–2021 administration because of the form reuse. Instead, the test production process for the 2020–2021 operational test forms was performed when the operational test forms were new, prior to the 2018–2019 administration. The following subsections refer to the test production process as performed prior to the 2018–2019 administration.

#### Psychometric Criteria and Identification of Eligible Items

In addition to the blueprints (CDE, 2015a [ELA] and 2015b [mathematics]) and test design documents, statistical guidelines were developed by the ETS psychometrics team to assist in test assembly. The guidelines included the following:

* All items must be operationally ready with item statistics.
* All items can be shared across the Stage 2 modules in that items included in both Easy and Hard modules must be Tier 2 items.
* Any previously administered item that has since been edited cannot be used as an anchor item and must appear in Stage 2.
* Each test pathway with 25 items should conform to the specifications in the test blueprint.

Refer to [appendix 4.B](#_Appendix_4.B:_Statistical_1) for a description of the statistical specifications used during development of the CAAs for ELA and mathematics.

#### Selection of Items

From the eligible item pool, test developers selected items that, as a whole

* met the coverage specifications of the test blueprint,
* met the form-building guidelines developed by the ETS psychometrics team,
* represented a wide variety of item types, and
* provided a wide variety of item context.

#### Psychometric Review

ETS test developers sent the proposed assessment to the ETS psychometrics team for approval. The proposed assessment was reviewed to ensure that all statistical guidelines were met for both individual items and the assessment as a whole by using the acceptable psychometric criteria to verify item statistics in the assessment. To pass this psychometric review, every item must not have been flagged. In addition, all fields related to scoring, such as the maximum scoring point, sequence of items in the form, domain ID, and item ID, were under the psychometric review. This review was designed to ensure that the forms were free from errors, particularly from all problematic items that were identified prior to finalizing the forms. Any flagged items would be discussed with ETS Assessment and Learning Technology Research & Development for the final decision.

Psychometric review results, including number of forms and number of items, are presented in table 4.4.

Table 4.4 Number of Forms and Items Reviewed Psychometrically

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Forms | Number of Operational Items | Number of Field Test Items | Total Items |
| ELA 3 | 17 | 40 | 20 | 60 |
| ELA 4 | 17 | 37 | 20 | 57 |
| ELA 5 | 17 | 37 | 20 | 57 |
| ELA 6 | 17 | 38 | 20 | 58 |
| ELA 7 | 17 | 40 | 20 | 60 |
| ELA 8 | 17 | 39 | 20 | 59 |
| ELA 11 | 17 | 38 | 20 | 58 |
| Mathematics 3 | 17 | 35 | 20 | 55 |
| Mathematics 4 | 17 | 38 | 20 | 58 |
| Mathematics 5 | 17 | 36 | 20 | 56 |
| Mathematics 6 | 17 | 38 | 20 | 58 |
| Mathematics 7 | 17 | 38 | 20 | 58 |
| Mathematics 8 | 17 | 36 | 20 | 56 |
| Mathematics 11 | 17 | 37 | 20 | 57 |
| **Overall** | 238 | 527 | 280 | 807 |

#### Content Review of Forms

After psychometric approval, the proposed assessment underwent two additional content reviews and one editorial review. The form reviewers are content specialists who work on testing programs other than the CAA, so they were able to bring a fresh perspective to the review. They were given the appropriate materials to complete the following tasks:

* Verification of item keys
* Identification of possible clueing across the items
* Verification that individual items meet the standard
* Verification of coverage of the standards
* Identification of any possible grammatical or production errors

#### California Department of Education Review of Forms

Following the ETS content review, all proposed assessments were sent to the CDE for review to ensure the proposed assessments met CAAs for ELA and mathematics test blueprint requirements and to check that there was no clueing between items or statistical issues. The CDE was provided with the following materials:

* Access to items in the item banking system
* *Directions for Administration* for the items
* Modified form planners
* Comment sheets

Comments from the CDE were resolved during a virtual meeting with the ETS test development team.

#### Configuration of the Test Delivery System

Once all the test reviews were completed and concerns, if any, had been resolved, the official ordered item sequence of the proposed forms was sent to Cambium Assessment, Inc. (CAI) for configuration of the TDS. Unlike other stages of the test production process, this stage must occur prior to every administration of the CAAs even in the case of a form reuse. Therefore, the configuration of the TDS was done prior to the 2020–2021 administration.

CAI’s TDS supports a variety of item layouts. Most of the item layouts had the stimulus and item response options and response area displayed side by side. In each of these item layouts, the stimulus and the response options had independent scroll bars. Each item underwent an extensive platform review on different operating systems such as Windows, Linux, and iOS, to ensure that the item looked consistent across all platforms.

The platform review was conducted by a team at CAI consisting of a team leader and several team members. The team leader presented the item as it was approved in ETS and CAI item banks. Each team member was assigned a different platform—hardware device and operating system—and reviewed the item to confirm that it rendered as expected. This platform review meeting ensured that all items were presented consistently to all students regardless of testing device or operating system for standardization of the test administration.

Prior to operational deployment, the testing system and content were deployed to a staging server where they were subject to user acceptance testing (UAT) by both ETS and CAI staff. The TDS UAT served as both a software evaluation and a content approval.

The UAT procedures followed by the ETS staff included reviewing all items for ELA and mathematics. The possible routing outcomes, in conjunction with the separate grade- and version-specific *CAA Directions for Administration* manuals, were also checked.

Following the UAT by ETS and CAI staff, separate UAT cycles were conducted by the CDE. The UAT review provided the CDE with an opportunity to interact with the exact test that would be administered to the students. The CDE had to approve the CAA UAT before the test could be released for administration to students.

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### Appendix 4.A: Test Blueprints Alignment by CAA Form

**Notes:**

1. ABO refers to Stage 1 items only.
2. ABE refers to Stage 1 + Stage 2 Easy module.
3. ABH refers to Stage 1 + Stage 2 Hard module.

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Three

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 30% | 3 | 30% | 7 | 28% | 8 | 32% |
| Reading: Informational | 25% | 2 | 20% | 6 | 24% | 6 | 24% |
| Reading: Vocabulary | 9% | 1 | 10% | 2 | 8% | 2 | 8% |
| Reading: Foundation | 6% | 1 | 10% | 2 | 8% | 2 | 8% |
| Writing | 30% | 3 | 30% | 8 | 32% | 7 | 28% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Four

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 30% | 3 | 30% | 8 | 32% | 8 | 32% |
| Reading: Informational | 25% | 3 | 30% | 7 | 28% | 7 | 28% |
| Reading: Vocabulary | 9% | 0 | 0% | 2 | 8% | 2 | 8% |
| Reading: Foundation | 6% | 0 | 0% | 1 | 4% | 1 | 4% |
| Writing | 30% | 4 | 40% | 7 | 28% | 7 | 28% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Five

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 30% | 4 | 40% | 8 | 32% | 8 | 32% |
| Reading: Informational | 30% | 2 | 20% | 7 | 28% | 7 | 28% |
| Reading: Vocabulary | 10% | 1 | 10% | 2 | 8% | 2 | 8% |
| Writing | 30% | 3 | 30% | 8 | 32% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Six

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 20% | 2 | 20% | 5 | 20% | 5 | 20% |
| Reading: Informational | 40% | 5 | 50% | 10 | 40% | 10 | 40% |
| Reading: Vocabulary | 10% | 0 | 0% | 2 | 8% | 2 | 8% |
| Writing | 30% | 3 | 30% | 8 | 32% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Seven

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 20% | 2 | 20% | 5 | 20% | 5 | 20% |
| Reading: Informational | 40% | 4 | 40% | 10 | 40% | 10 | 40% |
| Reading: Vocabulary | 10% | 1 | 10% | 2 | 8% | 2 | 8% |
| Writing | 30% | 3 | 30% | 8 | 32% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Eight

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 20% | 3 | 30% | 5 | 20% | 5 | 20% |
| Reading: Informational | 40% | 2 | 20% | 10 | 40% | 10 | 40% |
| Reading: Vocabulary | 10% | 1 | 10% | 2 | 8% | 2 | 8% |
| Writing | 30% | 4 | 40% | 8 | 32% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—ELA, Grade Eleven

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Content Category | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Reading: Literary | 15% | 1 | 10% | 4 | 16% | 4 | 16% |
| Reading: Informational | 45% | 5 | 50% | 11 | 44% | 11 | 44% |
| Reading: Vocabulary | 10% | 0 | 0% | 2 | 8% | 2 | 8% |
| Writing | 30% | 4 | 40% | 8 | 32% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Three

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Operational & Algebraic Thinking | 30% | 2 | 20% | 8 | 32% | 8 | 32% |
| Numbers & Operations in Base Ten and Fractions | 40% | 3 | 30% | 10 | 40% | 10 | 40% |
| Measurement & Data and Geometry | 30% | 5 | 50% | 7 | 28% | 7 | 28% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Four

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Operational & Algebraic Thinking | 35% | 1 | 10% | 8 | 32% | 8 | 32% |
| Numbers & Operations in Base Ten and Fractions | 30% | 5 | 50% | 8 | 32% | 8 | 32% |
| Measurement & Data and Geometry | 35% | 4 | 40% | 9 | 36% | 9 | 36% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Five

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Operational & Algebraic Thinking | 10% | 2 | 20% | 3 | 12% | 2 | 8% |
| Numbers & Operations in Base Ten and Fractions | 60% | 5 | 50% | 15 | 60% | 15 | 60% |
| Measurement & Data and Geometry | 30% | 3 | 30% | 7 | 28% | 8 | 32% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Six

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Ratios and Proportional Relationships | 30% | 4 | 40% | 7 | 28% | 7 | 28% |
| The Number System | 30% | 2 | 20% | 8 | 32% | 7 | 28% |
| Expressions & Equations | 20% | 3 | 30% | 5 | 20% | 5 | 20% |
| Geometry | 10% | 1 | 10% | 3 | 12% | 3 | 12% |
| Statistics & Probability | 10% | 0 | 0% | 2 | 8% | 3 | 12% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints by Form—Mathematics, Grade Seven

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Ratios and Proportional Relationships | 40% | 6 | 60% | 10 | 40% | 10 | 40% |
| The Number System | 15% | 1 | 10% | 4 | 16% | 4 | 16% |
| Expressions & Equations | 15% | 1 | 10% | 4 | 16% | 3 | 12% |
| Geometry | 15% | 1 | 10% | 3 | 12% | 4 | 16% |
| Statistics & Probability | 15% | 1 | 10% | 4 | 16% | 4 | 16% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Eight

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| The Number System | 10% | 0 | 0% | 2 | 8% | 2 | 8% |
| Expressions & Equations and Functions | 35% | 5 | 50% | 8 | 32% | 9 | 36% |
| Geometry | 30% | 4 | 40% | 8 | 32% | 8 | 32% |
| Statistics & Probability | 25% | 1 | 10% | 7 | 28% | 6 | 24% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A. Test Blueprints Alignment by Form—Mathematics, Grade Eleven

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Domain | % of the Blueprint | ABO N | ABO Pct | ABE N | ABE Pct | ABH N | ABH Pct |
| Number and Quantity: The Real Number System and Quantities | 25% | 3 | 30% | 6 | 24% | 7 | 28% |
| Algebra: Creating Equations, and Functions: Interpreting Functions | 40% | 4 | 40% | 10 | 40% | 10 | 40% |
| Geometry: Similarity, Right Triangles, and Trigonometry | 10% | 0 | 0% | 3 | 12% | 2 | 8% |
| Statistics and Probability: Interpreting Categorical and Quantitative Data | 25% | 3 | 30% | 6 | 24% | 6 | 24% |
| **Total** | **100%** | **10** | **100%** | **25** | **100%** | **25** | **100%** |

Table 4.A.15 Absolute Percentage Differences of Items per Domain Between the 2015–‍2016 Forms and the 2015–2016 Test Blueprint

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015–2016 | R1 + Easy | R1 + Moderate | R1 + Hard | R2 + Easy | R2 + Moderate | R2 + Hard |
| ELA 3 | 0%~3% | 0%~5% | 0%~3% | 0%~3% | 0%~5% | 0%~3% |
| ELA 4 | 0%~2% | 0%~4% | 0%~4% | 0%~2% | 0%~4% | 0%~4% |
| ELA 5 | 0%~3% | 0%~3% | 0%~11% | 0%~3% | 0%~3% | 0%~7% |
| ELA 6 | 0%~19% | 0%~8% | 3%~12% | 0%~12% | 0%~3% | 2%~4% |
| ELA 7 | 0%~9% | 1%~3% | 1%~3% | 0%~9% | 1%~3% | 1%~3% |
| ELA 8 | 1%~8% | 1%~10% | 1%~8% | 1%~8% | 1%~8% | 1%~8% |
| ELA 11 | 1%~11% | 1%~15% | 1%~11% | 3%~8% | 3%~11% | 3%~8% |
| Mathematics 3 | 2%~3% | 2%~3% | 2%~3% | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 4 | 0%~3% | 0%~3% | 0%~3% | 1%~4% | 1%~4% | 1%~4% |
| Mathematics 5 | 0%~4% | 0%~4% | 0%~4% | 0%~4% | 0%~4% | 0%~4% |
| Mathematics 6 | 1%~5% | 1%~5% | 1%~5% | 1%~8% | 1%~8% | 1%~8% |
| Mathematics 7 | 2%~9% | 2%~9% | 2%~9% | 0%~7% | 0%~7% | 0%~7% |
| Mathematics 8 | 0%~6% | 0%~6% | 0%~6% | 2%~3% | 2%~3% | 2%~3% |
| Mathematics 11 | 1%~9% | 1%~9% | 1%~9% | 1%~6% | 1%~6% | 1%~6% |

Table 4.A.16 Absolute Percentage Differences of Items per Domain Between the 2016–‍2017 Forms and the 2016–2017 Test Blueprint

|  |  |  |  |
| --- | --- | --- | --- |
| 2016–2017 | Router + Easy | Router + Moderate | Router + Hard |
| ELA 3 | 1%~6% | 1%~3% | 1%~10% |
| ELA 4 | 1%~3% | 1%~3% | 1%~2% |
| ELA 5 | 2%~2% | 2%~2% | 2%~2% |
| ELA 6 | 0%~6% | 0%~2% | 0%~6% |
| ELA 7 | 0%~2% | 0%~2% | 0%~2% |
| ELA 8 | 0%~2% | 0%~2% | 0%~2% |
| ELA 11 | 1%~2% | 1%~2% | 1%~2% |
| Mathematics 3 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 4 | 1%~3% | 1%~3% | 1%~3% |
| Mathematics 5 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 6 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 7 | 0%~3% | 0%~5% | 0%~3% |
| Mathematics 8 | 1%~2% | 1%~2% | 1%~2% |
| Mathematics 11 | 0%~2% | 0%~2% | 0%~2% |

Table 4.A.17 Absolute Percentage Differences of Items per Domain Between the 2017–‍2018 Forms and the 2017–2018 Test Blueprint

|  |  |  |  |
| --- | --- | --- | --- |
| 2017–2018 | Router + Easy | Router + Moderate | Router + Hard |
| ELA 3 | 1%~2% | 1%~6% | 1%~2% |
| ELA 4 | 3%~10% | 1%~6% | 1%~6% |
| ELA 5 | 2%~2% | 2%~2% | 2%~2% |
| ELA 6 | 0%~2% | 0%~2% | 0%~2% |
| ELA 7 | 0%~2% | 0%~6% | 2%~6% |
| ELA 8 | 0%~2% | 0%~2% | 0%~2% |
| ELA 11 | 1%~2% | 1%~3% | 1%~2% |
| Mathematics 3 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 4 | 0%~2% | 0%~3% | 0%~3% |
| Mathematics 5 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 6 | 0%~2% | 0%~2% | 0%~2% |
| Mathematics 7 | 0%~3% | 0%~3% | 0%~3% |
| Mathematics 8 | 0%~2% | 0%~5% | 0%~2% |
| Mathematics 11 | 0%~3% | 0%~3% | 0%~3% |

### Appendix 4.B: Statistical Specifications for 2018–2019 Test Development

Test assembly must follow guidelines to ensure the validity and reliability of test scores. These guidelines fall into two major categories: content-related and psychometric guidelines. Content-related guidelines ensure the appropriateness of item content and the alignment with standards. Psychometric guidelines provide specifications on the statistical properties of items, modules, and the entire multistage test.

The purpose of this specification is to summarize the specific *statistical* properties that were met when selecting items for the 2018–2019 CAAs.

#### Statistical Properties of Individual Items

Individual items need to satisfy a number of statistical specifications to be usable in the forms.

##### Average Item Score (AIS) Range

Items that are too difficult or too easy, indicated by a low or high AIS, should not be used as they serve little purpose of differentiating test takers’ abilities. The acceptable AISrange is generally between .10 and .95 for 1-point multiple-choice items and between .2 and 1.90 for 2‑point items.

##### Polyserial Correlations

Nondiscriminating items, indicated by a low polyserial correlation value, should not be used. For test assembly, the recommended minimum polyserial correlation value is .20. However, given the limited number of CAA items in the item bank, for the spring 2018–‍2019 administration, items with a polyserial correlation value between .10 and .20 could be included on the CAA forms to ensure complete test content coverage.

##### Differential Item Functioning (DIF)

Items analyzed for DIF at ETS are classified into one of three categories: A, B, or C. Category A indicates that DIF is negligible or nonsignificant, Category B indicates that DIF is slight to moderate, and Category C indicates that DIF is moderate to large. In addition, when DIF is detected, a plus or minus sign is often used in conjunction with the specific DIF category to indicate the direction of DIF: Classifications of B- or C- indicate DIF is in favor of the reference group; classifications of B+ and C+ indicate DIF is in favor of the focal group. Items that function differentially across different demographic examinee student groups that have similar overall test performance should not be used.

An item classified into Category C shows moderate to large DIF and should not be included in the operational form. If it is absolutely necessary to include an item exhibiting C-DIF on a test or if such an item is found on an operational form, the item must be reviewed by a panel that includes members of the focal group(s) affected. The members of the panel should not have a vested interest in the outcome of the decision. If no explanation for the DIF can be found, the item may be scored if it is in an operational form or may appear on the assembled test. In the latter case, the inclusion of no C-DIF items is preferred because this circumstance is beyond reproach in most cases. Additionally, if an item exhibiting C‑DIF must be selected, then a balance with regard to the C-DIF item should be considered; that is, C-DIF items should not be all C- or all C+.

### Appendix 4.C: Routing Thresholds

Table 4.C. CAA for ELA Routing Thresholds

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Stage 1 | Stage 2—Easy | Stage 2—Hard |
| ELA 3 | RS < 3 | 3 < = RS < 9 | RS > = 9 |
| ELA 4 | RS < 3 | 3 < = RS < 10 | RS > = 10 |
| ELA 5 | RS < 5 | 5 < = RS < 11 | RS > = 11 |
| ELA 6 | RS < 5 | 5 < = RS < 10 | RS > = 10 |
| ELA 7 | RS < 3 | 3 < = RS < 9 | RS > = 9 |
| ELA 8 | RS < 4 | 4 < = RS < 11 | RS > = 11 |
| ELA 11 | RS < 3 | 3 < = RS < 9 | RS > = 9 |

**Note:** RS indicates the raw score of 10 operational items in the router portion of Stage 1.

Table 4.C. CAA for Mathematics Routing Thresholds

| Test | Stage 1 | Stage 2—Easy | Stage 2—Hard |
| --- | --- | --- | --- |
| Mathematics 3 | RS < 3 | 3 < = RS < 10 | RS > = 10 |
| Mathematics 4 | RS < 4 | 4 < = RS < 11 | RS > = 11 |
| Mathematics 5 | RS < 4 | 4 < = RS < 11 | RS > = 11 |
| Mathematics 6 | RS < 3 | 3 < = RS < 9 | RS > = 9 |
| Mathematics 7 | RS < 3 | 3 < = RS < 9 | RS > = 9 |
| Mathematics 8 | RS < 4 | 4 < = RS < 10 | RS > = 10 |
| Mathematics 11 | RS < 2 | 2 < = RS < 11 | RS > = 11 |

**Note:** RS indicates the raw score of 10 operational items in the router portion of Stage 1.

## Test Administration

This chapter provides an overview of the test administration of the 2020–2021 California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics and includes a system functionality overview, descriptions of the efforts and measures to ensure test security, procedures to maintain standardization, and procedures for implementation of test accommodations based on the *Standards for Educational and Psychological Testing* (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014, Chapter 6).

### Test Administration

The window for 2020–2021 administration of the CAAs for ELA and mathematics was scheduled to take place from January 12 through July 30, 2021. Specific test administration schedules within that window were determined locally pursuant to the *California Code of Regulations*, Title 5 (5 *CCR),* Sections 855(a)(1), 855(a)(2), 855(b), and 855(c).

#### Resources for Administration

To ensure the 2020–2021 test administration was a successful experience for CAA test examiners and students, ETS provided an online, self-guided training tutorial for CAA test examiners (California Department of Education [CDE], 2020a) as well as virtual test administration workshops throughout California in January 2021. ETS also produced webcasts and videos for detailed information on California Assessment of Student Performance and Progress (CAASPP) test administration procedures. The virtual workshops included a session dedicated exclusively to the topic of the CAA test administration procedures.

In addition, ETS developed and posted a number of test administration resources for schools and local educational agencies (LEAs) on both the public CAASPP website and on the secure Test Operations Management System (TOMS) website. These resources included detailed information on topics such as technology readiness, test administration, test security, accessibility resources, using the test delivery system (TDS), and general testing rules. These resources are discussed in more detail in section [*5.4 Procedures to Maintain Standardization*](#_Procedures_to_Maintain_1).

Given that the CAAs are administered to students who have the most significant cognitive disabilities, a test examiner—usually the student’s teacher, who is familiar to the student—administers the CAA to the student one-on-one.

#### Item Routing

The 2020–2021 CAAs for ELA and mathematics were a two-stage multistage test (MST). Refer to [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for the details of the MST design. Figure 5.1 displays how the CAA items were routed, with details on the Student Response Check (SRC), Stage 1, and Stage 2.

The first four test questions in Stage 1 consisted of the SRC. The [**End Test**] button was available on question 1 or question 4 should the student not pass the SRC. Some students stopped testing after Stage 1 based on their performance in Stage 1.

In Stage 2, the student was routed to either the 15 easy items in the Easy module or the 15 hard items in the Hard module. If the student did not pass the SRC, the test examiner could use the [**End Test**] button to end the test, and the student stopped testing in Stage 1.



Figure 5.1 Test components and administration process

##### Administration of the Student Response Check

Test examiners responded to the SRC during the first stage of test administration for both the ELA and mathematics assessments to ensure that these CAAs were accessible and students were able to take the test.

The SRC is comprised of four questions. The instructions that were provided in the CAA *Directions for Administration (DFAs)* included information on specific behaviors that a test examiner should observe. There were three possible outcomes from administering the first test item:

1. The student demonstrated an observable, consistent response, even though the answer to the item may be incorrect.
2. The student demonstrated an observable, but inconsistent, response.
3. The student did not demonstrate any observable responses.

If the SRC outcome was 1, the test examiner administered the entire assessment, including the remaining items in Stage 1A and all items in Stage 1B. The student was then administered all items in Stage 2 if the student’s test administration does not end after Stage 1.

If the outcome was 2, the test examiner finished the next three items and, if a consistent and observable response was elicited through the next three items, the entire assessment was administered.

If the outcome was 3, the test examiner was instructed not to administer the assessment and to end the test. If, during testing, the student ceased to provide any observable response, the test examiner was instructed to end the test.

##### Administration of the Assessment

If the decision was made to continue with the test administration as a result of the SRC, students were given the following opportunities for continuing to the end of the full test or exiting early at the end of Stage 1, as shown in figure 5.1:

* After completion of the first 10 operational items (Stage 1), the TDS compared the student’s performance against the routing thresholds as shown in table 4.C.1 (ELA) or table 4.C.2 (mathematics) and determined whether to direct the student to Stage 2 or end testing.
* After the completion of the full Stage 1, if a minimum score threshold was met to continue with testing, the TDS routed the student to one of the two modules of Stage 2, as shown in figure 5.1.

### Test Security and Confidentiality

For the CAA test administration, every person who worked with the assessments, communicated test results, or received testing information was responsible for maintaining the security and confidentiality of the tests, including CDE staff, ETS staff, ETS subcontractors, LEA assessment coordinators, school assessment coordinators, students, parents/guardians, teachers, and cooperative educational service agency staff. ETS’ Code of Ethics required that all test information, including tangible materials (such as test items), confidential files (such as those containing personally identifiable student information), and processes related to test administration (such as the configurations of secure servers) were kept secure. To ensure security for all the tests that ETS develops or handles, ETS maintains an Office of Testing Integrity (OTI), which is described in the next subsection.

All tests within the CAASPP System, as well as the confidentiality of student information, should be protected to ensure the validity, reliability, and fairness of the results. As stated in Standard 7.9 (AERA, APA, & NCME, 2014), “The documentation should explain the steps necessary to protect test materials and to prevent inappropriate exchange of information during the test administration session” (p. 128).

This section of the *CAAs for ELA and Mathematics Technical Report* also describes the measures intended to prevent potential test security incidents prior to testing and the actions that were taken to handle security incidents occurring during or after the testing window using the Security and Test Administration Incident Reporting System (STAIRS) process.

#### ETS’ Office of Testing Integrity

The OTI is a division of ETS that provides quality-assurance services for all testing programs managed by ETS. This division resides in the ETS legal department. The Office of Professional Standards Compliance at ETS publishes and maintains the *ETS Standards for Quality and Fairness* (ETS, 2014), which supports the OTI’s goals and activities. The *ETS Standards for Quality and Fairness* provides guidelines to help ETS staff design, develop, and deliver technically sound, fair, and beneficial products and services and help the public and auditors evaluate those products and services.

The OTI’s mission is to

* minimize any testing security violations that can impact the fairness of testing,
* minimize and investigate any security breach that threatens the validity of the interpretation of test scores, and
* report on security activities.

The OTI helps prevent misconduct on the part of students and administrators, detects potential misconduct through empirically established indicators, and resolves situations involving misconduct in a fair and balanced way that reflects the laws and professional standards governing the integrity of testing.

In an effort to enforce secure testing practices, the OTI strives to safeguard the various processes involved in a test development and administration cycle. For the CAAs for ELA and mathematics, those processes included the following:

* Security of electronic files using a firewall
* Test administration
* Test delivery
* Processing and scoring
* Data management
* Statistical analysis
* Student confidentiality

#### Procedures to Maintain Standardization of Test Security

Test security requires the accounting of all secure materials—including computer-based summative test items and student data—before, during, and after each test administration. The LEA CAASPP coordinator is responsible for keeping all electronic test materials secure, keeping student information confidential, and making sure the CAASPP test site coordinators and test examiners are properly trained regarding security policies and procedures.

The CAASPP test site coordinator is responsible for mitigating test security incidents at the test site and for reporting incidents to the LEA CAASPP coordinator.

The test examiner is responsible for reporting testing incidents to the CAASPP test site coordinator and securely destroying printed and digital media for items and passages generated by the print-on-demand feature of the TDS (CDE, 2021b and 2021e).

The following measures ensured the security of CAASPP System assessments administered in 2020–2021:

* LEA CAASPP coordinators and test site coordinators must have electronically signed and submitted a “CAASPP Test Security Agreement for LEA CAASPP coordinators and CAASPP test site coordinators” form in TOMS before ETS granted the coordinators access to TOMS (5 *CCR*, Section 859[a]).
* Anyone having access to the testing materials must have electronically signed and submitted a “Test Security Affidavit for Test Examiners, Test Administrators, Proctors, Translators, Scribes, and Any Other Person Having Access to CAASPP Tests” form in TOMS before receiving access to any testing materials (5*CCR*, Section 859[c]).

In addition, it was the responsibility of every participant in the CAASPP System to report immediately any violation or suspected violation of test security or confidentiality. The test examiner reported to the CAASPP test site coordinator or LEA CAASPP coordinator, who then submitted the incident using the STAIRS/Appeals process. Breach incidents were to be reported by the LEA CAASPP coordinator to the California Technical Assistance Center (CalTAC) and entered into STAIRS within 24 hours of the incident (5 *CCR*, Section 859[e]).

#### Test Security Monitoring

The LEA and school testing staff were responsible for maintaining the security and confidentiality of testing materials and devices during the testing window and reporting any irregularities or breaches that occur. Typically, ETS would perform site visits and testing procedure audits during the testing window; however, these visits were not made during the 2020–2021 CAAs for ELA and mathematics administration because schools and LEAs were not open for in-person instruction as a result of the novel coronavirus disease 2019 (COVID-‍19) pandemic. It is expected that these visits will resume in future administrations per state health and safety guidelines. However, selected LEAs were audited remotely, with LEA CAASPP coordinators or other LEA staff responding to a series of questions about test administration.

#### Security of Electronic Files Using a Firewall

A firewall is software that prevents unauthorized entry to files, email, and other organization-specific information. All ETS data exchanges and internal email remain within the ETS firewall at all ETS locations, ranging from Princeton, New Jersey; to San Antonio, Texas; to Sacramento, California.

All electronic applications that are included in TOMS remain protected by the ETS firewall software at all times. Because of the sensitive nature of the student information processed by TOMS, the firewall plays a significant role in maintaining assurance of confidentiality among the users of this information.

Refer to section [*1.10 Systems Overview and Functionality*](#_Systems_Overview_and) in [*Chapter 1: Introduction*](#_Introduction) for more information on TOMS.

#### Transfer of Scores via Secure Data Exchange

Because of the confidential nature of test results, ETS currently uses secure file transfer protocol (SFTP) and encryption for all data file transfers; test data is never sent via email. SFTP is a method for reliable and exclusive routing of files. Files reside on a password-protected server that only authorized users can access. ETS shares an SFTP server with the CDE. On that site, ETS posts Microsoft Word and Excel files, Adobe Acrobat PDFs, or other document files for the CDE to review; the CDE returns reviewed materials in the same manner. Files are deleted upon retrieval.

The SFTP server is used as a conduit for the transfer of files; secure test data is stored only temporarily on the shared SFTP server. Industry-standard secure protocols are used to transfer test content and student data from the ETS internal data center to any external systems.

For the 2020–2021 CAAs for ELA and mathematics, ETS entered information about the deliverable into a web form on a SharePoint website when a file was posted. A CDE staff member monitored this log throughout the day for updates to the status of deliverables and downloaded and deleted the file from the SFTP server when its status showed it has been posted.

#### Data Management in the Secure Database

ETS currently maintains a secure database to house all student demographic data and assessment results. Information associated with each student has a database relationship to the LEA, school, and grade codes as data is collected during operational testing. Only individuals with the appropriate credentials can access the data. ETS builds all interfaces with the most stringent security considerations, including interfaces with data encryption for databases that store test items and student data. ETS applies best and up-to-date security practices, including system-to-system authentication and authorization, in all solution designs.

All stored test content and student data is encrypted. Industry-standard secure protocols are used to transfer test content and student data from the ETS internal data center to any external systems. ETS complies with the Family Educational Rights and Privacy Act (20 *United States Code [USC]* § 1232g; 34 *Code of Federal Regulations* Part 99) and the Children’s Online Privacy Protection Act (15 USC §§ 6501-6506, P.L. No. 105–277, 112 Stat. 2681–1728).

In TOMS, staff at LEAs and test sites have different levels of access appropriate to the role assigned to them (CDE, 2021d).

#### Statistical Analysis on Secure Servers

During CAASPP testing, ETS information technology staff members retrieve data files from Cambium Assessment, Inc. (CAI) and load those files into a database. The ETS Data Quality Services staff extract the data from the database and perform quality control procedures (e.g., the values of all variables are as expected) before passing files to the ETS statistical analysis group (refer to section [*9.4 Quality Control of Scoring*](#_Quality_Control_of) for data validation processes undertaken by ETS Data Quality Services). The statistical analysis staff store the files on secure servers. All staff involved with the data adhere to the ETS Code of Ethics and the ETS Information Protection Policies to prevent any unauthorized access to data.

#### Student Confidentiality

To meet the requirements of the Every Student Succeeds Act, as well as state requirements, LEAs must collect demographic data about students’ ethnicity, disabilities, parent/guardian education, and so forth during the school year. ETS takes every precaution to prevent any of this information from becoming public or being used for anything other than for testing and score-reporting purposes. These procedures are applied to all documents in which student demographic data appears, such as technical reports.

#### Student Test Results

##### Types of Results

The following deliverables are produced for reporting of the CAAs:

* Individual Student Score Reports (SSRs) (electronic)
* Preliminary individual student reports for computer-based assessments in the California Educator Reporting System
* Internet reports—available on a public web reporting site—aggregated by content area and state, county, LEA, or test site

##### Security of Results Files

ETS takes measures to protect files and reports that show students’ scores and achievement levels. ETS is committed to safeguarding all secure information in its possession from unauthorized access, disclosure, modification, or destruction. ETS has strict information security policies in place to protect the confidentiality of both student and client data. ETS staff access to production databases is limited to personnel with a business need to access the data. User IDs for production systems must be person-specific or for systems use only.

ETS has implemented network controls for routers, gateways, switches, firewalls, network tier management, and network connectivity. Routers, gateways, and switches represent points of access between networks. However, these do not contain mass storage or represent points of vulnerability, particularly for unauthorized access or denial of service.

ETS has many facilities, policies, and procedures to protect computer files. Software and procedures such as firewalls, intrusion detection, and virus control are in place to provide for physical security, data security, and disaster recovery. ETS is certified in the BS 25999-2 standard for business continuity and conducts disaster recovery exercises annually. ETS routinely backs up all data to either disks through deduplication or to tapes, all of which are stored off site.

Access to the ETS Computer Processing Center is controlled by employee and visitor identification badges. The Center is secured by doors that can be unlocked only by the badges of personnel who have functional responsibilities within its secure perimeter. Authorized personnel accompany visitors to the ETS Computer Processing Center at all times. Extensive smoke detection and alarm systems, as well as a preaction fire-control system, are installed in the Center.

##### Security of Individual Results

ETS protects individual students’ results during the following events:

* Scoring
* Transfer of scores by means of secure data exchange
* Reporting
* Posting of aggregated data
* Storage

In addition to protecting the confidentiality of testing materials, ETS’ Code of Ethics further prohibits ETS employees from financial misuse, conflicts of interest, and unauthorized appropriation of ETS property and resources. Specific rules are also given to ETS employees and their immediate families who may take a test developed by ETS (e.g., a CAA). The ETS OTI verifies that these standards are followed throughout ETS. This verification is conducted, in part, by periodic on-site security audits of departments, with follow-up reports containing recommendations for improvement.

#### Security and Test Administration Incident Reporting System Process

Test security incidents, such as improprieties, irregularities, and breaches, are prohibited behaviors that give a student an unfair advantage or compromise the secure administration of the tests, which, in turn, compromises the reliability and validity of test results (CDE, 2021b). Whether intentional or unintentional, failure by staff or students to comply with security rules constitutes a test security incident. Test security incidents have impacts on scoring and affect students’ performance on the test.

LEA CAASPP coordinators and CAASPP test site coordinators ensured that all test security and summative administration incidents were documented by following the prompts in TOMS that guided coordinators in their submittal. An Appeal is a request to reset, restore, reopen, invalidate, or grant a grace period extension to a student’s test. If an Appeal to a student’s test was warranted, TOMS provided additional prompts to file the Appeal.

After a case was submitted, an email containing a case number and next steps was sent to the submitter (and to the LEA CAASPP coordinator, if the case was submitted by the CAASPP test site coordinator). The STAIRS case in TOMS provided the LEA CAASPP coordinator, the CDE, and CalTAC with the opportunity to interact and communicate regarding the STAIRS process (CDE, 2021b).

Prior to the assessment administration, ETS and the CDE agreed that the following types of STAIRS cases, as applicable to the CAAs, were also forwarded to the CDE:

* Security breach (where a student exposed secure materials)
* Restoring a test that had been reset

Appeals requests were reviewed by the CDE or CalTAC. When a request to submit an Appeal was approved, the coordinator received a system-generated email with the Appeal type that was approved (CDE, 2021b).

Types of Appeals available during the 2020–2021 CAASPP administration are described in table 5.1.

Table 5.1 Types of Appeals in CAASPP Testing

|  |  |
| --- | --- |
| Type of Appeal | Description |
| Reset | Resetting a student’s summative assessment removed that assessment from the system and enabled the student to start a new assessment from the beginning. |
| Invalidate | Invalidated summative assessments were scored, and scores were provided on the SSR with a note that an irregularity occurred. The student(s) was counted as participating in the calculation of the school’s participation rate for accountability purposes. The score was counted as “not proficient” for aggregation into the CAASPP results. |
| Re-open | Reopening a summative assessment allowed a student to access an assessment that had already been submitted or had expired. |
| Restore | Restoring a summative assessment returned an assessment from the Reset status to its prior status. This action could be performed only on tests that were reset previously. |

Table 5.1 *(continuation)*

|  |  |
| --- | --- |
| Type of Appeal | Description |
| Grace Period Extension | Permitting a grace period extension allowed the student to review previously answered questions upon logging back on to the assessment after expiration of the pause rule. Note that for a performance task, having the test administrator open a new testing session may be all that was needed to continue testing.  A grace period extension was granted only in cases where there was a disruption to a test session, such as a technical difficulty, fire drill, schoolwide power outage, earthquake, or other act beyond the control of the test administrator. |

##### Impropriety

A testing impropriety is an unusual circumstance that has a low impact on the individual or group of students who are testing and has a low risk of potentially affecting student performance on the test, test security, or test validity. An impropriety can be corrected and contained at a local level. An impropriety should be reported to the LEA CAASPP coordinator and CAASPP test site coordinator immediately. The coordinator should report the incident within 24 hours, using the STAIRS/Appeals process in TOMS.

##### Irregularity

A testing irregularity is an unusual circumstance that impacts an individual or a group of students who are testing and may potentially affect student performance on the test or impact test security or test validity. These circumstances can be corrected and contained at the local level and submitted using the online STAIRS/Appeals process in TOMS. An irregularity must be reported to the LEA CAASPP coordinator and CAASPP test site coordinator immediately. The coordinator must report the irregularity within 24 hours, using the STAIRS/Appeals process in TOMS.

##### Breach

A testing breach is an event that poses a threat to the validity of the test. Breaches require immediate attention; a breach that was due to social media exposure on the part of a student or adult or due to media coverage of an administration was to be escalated to CalTAC via telephone. Following the call, the CAASPP test site coordinator or LEA CAASPP coordinator must report the incident using the online STAIRS/Appeals process in TOMS within 24 hours. All other breaches were to be entered into STAIRS directly.

Examples may include such situations as a release of secure materials or a security or system risk. These circumstances have external implications for the CDE and may result in a decision to remove the test item(s) from the available secure item bank.

#### Appeals

For test security incidents reported in STAIRS that resulted in a need to reset, reopen, invalidate, or restore individual computer-based student assessments, the request had to be approved by the CDE. Requests to reset and reopen assessments were processed by CalTAC.

In most instances, an Appeal was submitted to address a test security breach or irregularity. The LEA CAASPP coordinator or CAASPP test site coordinator submitted Appeals in TOMS. All submitted Appeals were available for retrieval and review by the appropriate credentialed users within a given organization. However, the view of Appeals was restricted according to the user role as established in TOMS. An Appeal could be requested only by the LEA CAASPP coordinator or CAASPP test site coordinator if prompted while filing a STAIRS case in TOMS (CDE, 2021b). Types of Appeals available during the 2020–2021 CAASPP administration are described in table 5.1.

Table 5.2 and table 5.3 show the number and types of incidents submitted to STAIRS in the 2020–2021 administration for ELA and mathematics, respectively, as well as the number of Statewide Student Identifiers (SSIDs) submitted and approved.

Table 5.2 Number and Types of Incidents Submitted in STAIRS in the 2020–2021 Administration—ELA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Appeal Type | Number of Incidents | Total Number of SSID(s) Submitted | Appeals SSID(s) Approved |
| Accessibility Issue | Reset | 0 | 0 | 0 |
| Administered Incorrect Assessment | Reset, Re-open, or No Appeal | 4 | 4 | 4 |
| Administration Error | No Appeal | 3 | 0 | 0 |
| Data Entry Issue | Reset, Re-open, Invalidate, or No Appeal | 0 | 0 | 0 |
| Expired or Accidentally Submitted Test | Re-open | 8 | 8 | 8 |
| Exposing Secure Materials | Invalidate or No Appeal | 0 | 0 | 0 |
| Incorrect SSID Used | Reset or No Appeal | 1 | 2 | 0 |
| Restore from Reset | Restore | 0 | 0 | 0 |
| Student Cheating or Accessing Unauthorized Devices | Invalidate | 0 | 0 | 0 |
| Student Disruption | No Appeal | 3 | 0 | 0 |
| Technical Issues | Grace Period Extension or No Appeal | 0 | 0 | 0 |
| Validity Issue | Invalidate or Reset | 0 | 0 | 0 |

Table 5.3 Number and Types of Incidents Submitted in STAIRS in the 2020–2021 Administration—Mathematics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Appeal Type | Number of Incidents | Total Number of SSID(s) Submitted | Appeals SSID(s) Approved |
| Accessibility Issue | Reset | 1 | 1 | 0 |
| Administered Incorrect Assessment | Reset, Re-open, or No Appeal | 3 | 3 | 3 |
| Administration Error | No Appeal | 0 | 0 | 0 |
| Data Entry Issue | Reset, Re-open, Invalidate, or No Appeal | 0 | 0 | 0 |
| Expired or Accidentally Submitted Test | Re-open | 6 | 6 | 6 |
| Exposing Secure Materials | Invalidate or No Appeal | 0 | 0 | 0 |
| Incorrect SSID Used | Reset or No Appeal | 1 | 2 | 0 |
| Restore from Reset | Restore | 0 | 0 | 0 |
| Student Cheating or Accessing Unauthorized Devices | Invalidate | 0 | 0 | 0 |
| Student Disruption | No Appeal | 1 | 0 | 0 |
| Technical Issues | Grace Period Extension or No Appeal | 0 | 0 | 0 |
| Validity Issue | Invalidate or Reset | 0 | 0 | 0 |

Table 5.4 and table 5.5 present the number of Appeals approved and rejected, respectively, by Appeal type in ELA and mathematics.

Table 5.4 Number of Appeals Approved in STAIRS in the 2020–2021 Administration

|  |  |  |
| --- | --- | --- |
| Appeal Type | Number of Appeals Approved in ELA | Number of Appeals Approved in Mathematics |
| Reset | 4 | 3 |
| Re-open | 8 | 6 |
| Invalidate | 0 | 0 |
| Grace Period Extension | 0 | 0 |
| Restore | 0 | 0 |

Table 5.5 Number of Appeals Rejected in STAIRS in the 2020–2021 Administration

|  |  |  |
| --- | --- | --- |
| Appeal Type | Number of Appeals Rejected in ELA | Number of Appeals Rejected in Mathematics |
| Reset | 0 | 1 |
| Re-open | 0 | 0 |
| Invalidate | 0 | 0 |
| Grace Period Extension | 0 | 0 |
| Restore | 0 | 0 |

### Processing and Scoring

The CAAs for ELA and mathematics were administered as computer-based assessments only and required two internet-connected devices: a student testing device and a separate device the test examiner used to start a test session through the Test Administrator Interface. Test examiners also used their device to open or print a *DFA* document, which was used by the test examiner to guide the student through the test. The CAAs for ELA and mathematics required the installation of CAASPP secure browsers on student testing devices. These are the same secure browsers that were used for the other computer-based CAASPP assessments.

All item types were designed to be machine-scorable, with the exception of a small subset of constructed-response (CR) items. For CR items, item-specific rubrics were included in the *DFAs* to be used by the test examiner for rating a student’s response. All rubric-based scoring was conducted and entered into the TDS by the test examiner during test administration. Scoring rubrics were included in the *DFAs*.

### Procedures to Maintain Standardization

The test administration and scoring procedures were designed so that the tests were administered and scored in a standardized manner. ETS took all necessary measures to ensure the standardization of test administration, as described in this section of the technical report.

#### Local Educational Agency CAASPP Coordinator

An LEA CAASPP coordinator was designated by the district superintendent at the beginning of the 2020–2021 school year. LEAs include public school districts, State Board of Education–authorized charter schools, county office of education programs, and direct funded charter schools.

LEA CAASPP coordinators were responsible for ensuring the proper and consistent administration of the assessments that are part of the CAASPP System, including the CAAs. In addition to the responsibilities set forth in 5 *CCR* Section 857, their responsibilities included

* adding CAASPP test site coordinators and test examiners into TOMS;
* training CAASPP test site coordinators and test examiners regarding state requirements and CAA administration, as well as security policies and procedures;
* reporting test security incidents (including testing irregularities) to the CDE using the online STAIRS/Appeals process;
* overseeing test administration activities;
* providing checklists for CAASPP test site coordinators and test examiners to review in preparation for administering the summative assessments;
* filing a report of a testing incident in STAIRS; and
* requesting an Appeal (if indicated by TOMS prompts while reporting an incident using the STAIRS/Appeals process).

#### CAASPP Test Site Coordinator

A CAASPP test site coordinator was trained by the LEA CAASPP coordinator for each test site (5 *CCR* Section 857[f]). A test site coordinator must be an employee of the LEA and must sign a security agreement (5 *CCR* Section 859[a]).

A test site coordinator was responsible for identifying test examiners and ensuring that they have signed CAASPP Test Security Affidavits (5 *CCR* Section 859[d]). CAASPP test site coordinators’ duties may have included

* adding test examiners into TOMS;
* entering test settings for students;
* creating testing schedules and procedures for a school consistent with state and LEA policies;
* working with technology staff to ensure secure browsers are installed and any technical issues are resolved;
* monitoring testing progress during the testing window and ensuring all students take the test, as appropriate;
* coordinating and verifying the correction of student data errors in the California Longitudinal Pupil Achievement Data System;
* ensuring a student’s test session is rescheduled, if necessary;
* addressing testing problems;
* reporting test security incidents (including testing irregularities) to the CDE using the online STAIRS/Appeals process;
* overseeing administration activities at a school site; and
* requesting an Appeal (if indicated by TOMS prompts while reporting an incident using the STAIRS/Appeals process) .

#### Test Examiners

Test examiners were identified by CAASPP test site coordinators as individuals who would administer the CAASPP assessments. A test examiner must be a certificated or licensed school staff member (5*CCR* Section 850[ag]) and sign a security affidavit (5 *CCR* Section 859[d]).

A test examiner’s duties may have included

* participating in training by either viewing the online test administration tutorial or attending any locally provided training;
* ensuring the physical conditions of the testing room meet the criteria for a secure test environment;
* administering the CAAs;
* reporting all test security incidents to the test site coordinator and LEA CAASPP coordinator in a manner consistent with state and LEA policies;
* viewing student information prior to testing to ensure that the correct student receives the proper test with appropriate resources and reporting potential data errors to test site coordinators and LEA CAASPP coordinators;
* monitoring student progress throughout the test session using the Test Administrator Interface; and
* complying fully with all directions provided in the *DFAs* for the CAAs.

#### Instructions for Test Examiners and Staff Involved in CAA Administration

##### *Directions for Administration*

Test examiners used a grade-level edition of the secure *DFAs* for the CAAs, located in TOMS, to administer the CAAs for ELA and mathematics to students. Test examiners followed all directions and guidelines and read, word-for-word, the instructions to students in the administration script to ensure standardization of test administration. *DFAs* also included scoring rubrics where warranted.

Sample *DFAs* for the CAAs to be used in conjunction with the CAA practice and training tests were provided to LEAs as well (CDE, 2021f and 2021g).

##### *CAASPP Online Test Administration Manual*

The *CAASPP Online Test Administration Manual* (CDE, 2021e) contained information and instructions on overall procedures and guidelines for all LEA and test site staff involved in the administration of computer-based assessments. Sections included the following topics:

* Roles and responsibilities of those involved with CAASPP testing
* Test administration resources
* Test security
* Administration preparation and planning
* General test administration
* Instructions for steps to take before, during, and after testing
* Overview of the student testing interface

Appendices included definitions of common terms, item types, and descriptions of different aspects of the test and systems associated with the test.

##### *CAASPP and English Language Proficiency Assessments for California Test Operations Management System User Guide*

TOMS is a web-based application that allows LEA CAASPP coordinators to set up test administrations, add and manage users, and submit computer-based student test settings. Test examiners accessed TOMS to retrieve CAA *DFAs*.

TOMS modules described in the *TOMS User Guide* included the following (CDE, 2021d):

* **Test Administration Setup—**This module allowed LEAs to determine and calculate dates for the LEA’s 2020–2021 administration of the CAAs.
* **Adding and Managing Users—**This module allowed LEA CAASPP coordinators to add CAASPP test site coordinators and test examiners to TOMS so that the designated user could administer, monitor, and manage the alternate assessment.
* **Reports—**This module allowed LEA CAASPP coordinators and CAASPP test site coordinators access to the various reports in TOMS.
* **STAIRS/Appeals—**This module allowed LEA CAASPP coordinators and CAASPP test site access to create new STAIRS cases or search for STAIRS/Appeals cases.
* **Student Profile—**This module allowed LEA CAASPP coordinators, CAASPP test site coordinators, and test administrators and test examiners to view and manage student test assignments and test settings.

##### Other System Manuals

Other manuals were created to assist LEA CAASPP coordinators and others with the technological components of the CAASPP System and are listed next:

* ***CAASPP and ELPAC Technical Specifications and Configuration Guide for Online Testing*—**This manual provided information, tools, and recommended configuration details to help technology staff prepare computers and install the secure browser to be used for the computer-based CAASPP assessments (CDE, 2021c).
* ***CAASPP and ELPAC Security Incidents and Appeals Procedure Guide*—**This manual provided information on how to report a testing incident and submit an Appeal to the CDE to reset, reopen, invalidate, or restore individual computer-based student assessments (CDE, 2021b).
* ***CAASPP and ELPAC Accessibility Guide for Online Testing*—**This manual provided descriptions of the accessibility features for computer-based tests as well as information about supported hardware and software requirements for administering tests to students using accessibility resources, including those with a braille accommodation using the software Job Access With Speech (JAWS®) tool or a braille embosser (hardware). Students with a braille accommodation were able to take advantage of the adaptive algorithm using the TDS’s Enhanced Accessibility Mode and JAWS (CDE, 2021a).

### Local Educational Agency Training

Each year, ETS, in collaboration with the CDE and its Assessment Validity and Outreach contractor, the Sacramento County Office of Education (SCOE), establishes and implements a comprehensive training plan for LEA assessment staff and educators on all aspects of the assessment program. The ETS and SCOE annual training plans are developed with interested educator feedback and specify the audience, topics, frequency, and mode (in person, webcast, videos, modules, etc.) of the training, including such elements as format, participants, and logistics.

In 2020–2021, ETS and SCOE adapted training plans to meet the needs of educators deciding how to complete testing during the COVID-19 pandemic while adhering to local health guidance. All in-person trainings were converted to a virtual format, and the longer trainings were separated into shorter segments to avoid learner fatigue.

Knowing that educators were confronted with new challenges daily that put additional demands on their time, ETS and SCOE made every effort to make the information available in a variety of ways that allowed educators access to training at a time that was responsive to their varying circumstances. This included offering training events on multiple days and times, livestreaming events, recording and archiving trainings, and converting trainings to self-paced modules that could be taken any time, at the learner’s convenience.

All training opportunities were posted in one centralized location on the CAASPP website. LEA staff were able to register for training opportunities, across both CDE contractors’ offerings, in one place, on the Upcoming Training Opportunities web page. A Past Training Opportunities web page was also created, making it easier for educators to find missed training opportunities and providing easier access to recorded trainings.

#### Workshops, Virtual Training, and Webcasts

All offered virtual trainings that were offered were recorded and made available for on-demand viewing. Most trainings were offered via Zoom, a platform that educators quickly became familiar with and comfortable using during the COVID-19 pandemic. Zoom provided an opportunity for educators to ask questions and get answers in real time. Virtual trainings were also livestreamed on YouTube so that educators still had access if a particular training reached registration capacity.

In response to an environment where educators had competing priorities to juggle, ETS and SCOE employed a variety of strategies to increase engagement during virtual trainings. Live polls were presented to solicit real-time feedback about attendees’ knowledge of a particular topic, allowing presenters to tailor presentations to the audience’s level of understanding. The chat functionality was enabled to give participants an opportunity to interact with each other or provide open-ended feedback, or it was disabled to minimize distraction and drive attendees’ focus to the information being presented. Breakout groups were used in smaller group trainings, as appropriate. Breaks and processing time were incorporated into presentations to give attendees opportunities to attend to other responsibilities that might result as part of their job or home environment. Registered participants received an email from SCOE linked to the virtual trainings.

Working closely with the CDE, ETS and SCOE were able to increase support to educators during a particularly challenging year. ETS offered weekly Office Hours and Coffee Sessions. Office Hours included CDE and ETS leadership to provide quickly changing updates on policies related to testing. Guest speakers from LEAs were invited to offer solutions and strategies for dealing with the challenges happening at the local level. Coffee Sessions included technical staff who could answer questions about all aspects of testing, including the newly offered remote testing option. SCOE continued to offer assessment update meetings intended to provide LEA coordinators with regular updates about California’s assessment system. All trainings and meetings were recorded and archived for on-demand viewing on the Past Training Opportunities web page on the CAASPP website.

An unexpected benefit of the COVID-19 pandemic is that educators had greater access to CDE, ETS, and SCOE staff than they had in prior administration years. This challenging year provided an opportunity to provide more targeted support to educators that will have a lasting impact on the administrations to come.

#### Videos and Guides

To supplement the virtual trainings, ETS continued to produce videos on various aspects of administering the CAASPP. SCOE produced the accompanying quick reference guides, providing multiple avenues of support for educators administering the assessments.

#### Training for Proper Identification and Assignment of Designated Supports and Accommodations

ETS produced short demonstration videos for every embedded accessibility resource, demonstrating how to use the resource for educators, students, and parents/guardians. The videos were available in both English and Spanish on the Accessibility Resources Demonstration Videos web page on the CAASPP website. In addition, ETS developed a video with LEA staff to help California educators learn more about the importance of implementing CAASPP accessibility resources and best practices used by educators in the field. The “Importance of Implementing CAASPP and the English Language Proficiency Assessments for California (ELPAC) Accessibility Resources: Voices from Educators” video was available on the Quick Reference Guides and Videos web page on the CAASPP website.

Accessibility resource videos were also linked within the Individual Student Assessment Accessibility Profile (ISAAP) Tool, increasing access to the demonstration videos. Educators using the ISAAP Tool to determine the student’s needs could view the corresponding demonstration video without having to navigate away from the tool.

A video on how to use the ISAAP Tool was also available to support educators in the process of creating an individual student profile and matching accessibility resources to student needs to ensure a fair and valid testing experience for all students.

For the 2020–2021 CAASPP administration, ETS introduced a new virtual training series, “Matching Accessibility Resources to Students’ Needs.” This training focused on providing participants with an understanding of the importance of accessibility resources, the categories of accessibility resources, and the process for matching students with appropriate accessibility resources for daily instruction and on assessments. The virtual training was originally intended as a one-time event but, because of overwhelming interest, the training was offered on four additional dates. The training was recorded and archived. LEA coordinators, test site coordinators, test administrators, and test examiners were notified via email when the recorded training was available, further extending its reach.

At the California Assessment Conference, SCOE offered three sessions on accessibility. A “Plenary Accessibility 101” session was available as a prerecorded session for all conference attendees and was intended to build a shared understanding of basic accessibility-related terms and considerations. The “Digging Deeper into Accessibility” breakout session focused on developing an equitable and systematic process for matching students with appropriate accessibility resources. “Universal Design for Learning and Accessibility Resources: A Pathway to Success for All Students” was another breakout session focused on providing an opportunity to practice appropriately matching student needs to the various accessibility resources.

### Accessibility Resources

The CAAs for ELA and mathematics 2020–2021 operational assessments offered commonly used accessibility resources available through the CAASPP computer-based testing platform, where applicable for the tested construct.

#### Accessibility Resource Categories

The purpose of universal tools, designated supports, and accommodations in testing is to allow *all* students the opportunity to demonstrate what they know and are able to do, rather than giving students who use these resources an advantage over other students or artificially inflating their scores. Universal tools, designated supports, and accommodations minimize or remove barriers that could otherwise prevent students from demonstrating their knowledge, skills, and achievement in a specific content area.

##### Universal Tools

Universal toolswere available to all students by default, although they could be disabled if a student found them distracting. Each universal tool fell into one of two categories: embedded and non-embedded. Embedded universal tools were provided through the Student Testing Interface (through the CAASPP secure browser), although they could be turned off by a test administrator.

The resources in the following subsections were available in the 2020–2021 CAAs for ELA and mathematics administration.

###### Embedded

* Breaks
* Digital notepad
* Expandable items
* Expandable passages
* Highlighter
* Keyboard navigation
* Line reader
* Mark for review
* Math tools (mathematics only)
* Strikethrough
* Writing tools (e.g., bold, italic, bullets, undo or redo) (for specific ELA items)
* Zoom (in or out)

###### Non-embedded

* Breaks
* Scratch paper

##### Designated Supports

Designated supports were available to all students through the test settings in TOMS. The designated supports each fell into one of two categories: embedded and non-embedded. Embedded designated supports were provided through the Student Testing Interface (through the CAASPP secure browser).

The resources in the following subsections were available in the 2020–2021 CAAs for ELA and mathematics administration.

###### Embedded

* Color contrast
* Masking
* Mouse pointer (size and color)
* Permissive mode
* Print (font) size
* Streamline
* Turn off any universal tool(s)

###### Non-embedded

* Amplification
* Color contrast
* Color overlay
* Magnification
* Medical supports
* Noise buffers
* Read aloud (items)
* Scribe (nonwriting items)
* Separate setting (special lighting or acoustics, adaptive furniture, time of day)

##### Accommodations

Accommodations are changes in procedures or materials that increased equitable access during the CAASPP assessments. Assessment accommodations for students who needed them generated valid assessment results; they allowed these students to show what they know and can do. Accommodations did not compromise the learning expectations, construct, grade-level standard, or intended outcome of the assessments.

The resources in the following subsections were available in the 2020–2021 CAAs for ELA and mathematics administration. Note there were no embedded accommodations for the CAAs for ELA and mathematics.

###### Non-embedded

* 100s numbers table (mathematics only)
* Abacus (mathematics only)
* Additional instructional supports and resources for alternate assessments
* Alternate response options
* Multiplication table (mathematics only)
* Print on demand
* Read aloud (ELA reading passages)
* Scribe (ELA writing items)
* Word prediction

##### Unlisted Resources

An unlisted resource is an instructional support a student regularly uses in daily instruction, assessment, or both, and has not been previously identified as a universal tool, designated support, or accommodation. The Accessibility Matrix included an inventory of unlisted resources that were already identified and were preapproved (CDE, 2020b). During the 2020–2021 CAASPP administration, an LEA CAASPP coordinator or a CAASPP test site coordinator would use TOMS to submit a request for use of an unlisted resource. A preidentified, preapproved unlisted resource was automatically approved. A request for an unlisted resource that was not preidentified was sent to the CDE for review and adjudication.

If a student was assigned an unlisted resource that changed the construct of the assessment, the student’s score was invalidated. A student with an invalidated score received a score on the Student Score Report (SSR) with a footnote that the test was administered under conditions that resulted in a score that may not be an accurate representation of the student’s achievement. Invalidated scores were assigned the lowest obtainable scale score in calculations for the California Accountability Dashboard and were removed from aggregations on the Test Results for California’s Assessments website.

#### Identification

All public school students participate in the CAASPP System, including students with disabilities and English learner students. The Smarter Balanced Assessment Consortium’s *Usability, Accessibility, and Accommodations Guidelines* (Smarter Balanced, 2020) and the CDE’s California Assessment Accessibility Resources Matrix (Accessibility Matrix) (CDE, 2020b) are intended for school-level personnel and individualized education program (IEP) and Section 504 plan teams to select and administer the appropriate universal tools, designated supports, and accommodations as deemed necessary for individual students. 6The CAAs for ELA and mathematics follow the Smarter Balanced recommendations for use (Smarter Balanced, 2020).

The *Guidelines* apply to all students and promote an individualized approach to the implementation of assessment practices. Another web document, the *Smarter Balanced Resources and Practices Comparison Crosswalk* (Smarter Balanced, 2018), connects the assessment resources described in the *Guidelines* with associated classroom practices. [[6]](#footnote-7)

Another manual, the *Smarter Balanced Usability, Accessibility, and Accommodations Implementation Guide* (Smarter Balanced, 2014),provides suggestions for implementation of these resources. Test examiners are given the opportunity to participate in the CAAs for ELA and mathematics practice and training tests so that students have the opportunity to familiarize themselves with a designated support or accommodation prior to testing.

#### Assignment

Once the student’s IEP or Section 504 plan team decided which accessibility resource(s) the student should use, LEA CAASPP coordinators and CAASPP test site coordinators used TOMS to assign designated supports and accommodations to students prior to the start of a test session.

There were three ways the student’s accessibility resource(s) could be assigned:

1. Using the ISAAP Tool to identify the accessibility resource(s) and then uploading the spreadsheet it creates into TOMS (This process is discussed in more detail in subsection [*2.5.1.1 Selection*](#_Resources_for_Selection).)
2. Using the Online Student Test Settings template to enter students’ assignments and then uploading the spreadsheet into TOMS
3. Entering assignments for each student individually in TOMS

If a student’s IEP or Section 504 plan team identified and designated a resource not identified in the Accessibility Matrix, the LEA CAASPP coordinator or CAASPP test site coordinator needed to submit a request for an unlisted resource to be approved by the CDE. The CDE then determined whether the requested unlisted resource changed the construct being measured before the student started testing.

#### Usage of Designated Supports and Accommodations

LEA CAASPP coordinators and CAASPP test site coordinators were responsible for assigning their students’ test settings in TOMS before testing occurred and providing the necessary resources during testing. If a test setting was not applied before testing, then a STAIRS incident was to be submitted to reset the test so the student could be retested with the correct accommodation or designated support. If a test setting was accidentally assigned to a student, then a STAIRS incident was also to be submitted to reset the test so the student could be retested without the accommodation or designated support.

After schools and LEAs assigned eligible students to accommodations or designated supports, CAI’s TDS provided and captured whether a certain accommodation or designated support (or multiple accommodations or designated supports) was used by a student as the student progressed through the test.

Table 5.6 and table 5.7 report the number of students who, based on the availability of data, were assigned to a certain accommodation or designated support and who actually used this accommodation or designated support.

Types of accommodations and designated supports—labeled “ACC” and “DS” in the *Resource Type* column—included in table 5.6 and table 5.7 are as follows:

* **Print on Demand:** Paper copies of passages and stimuli, items, or all of these are printed for students.
* **Masking:** This resource involves blocking off content that is not of immediate need or that may be distracting to the student.

Table 5.6 Summary of Accommodations and Designated Supports Used by Students—‍ELA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade | Support | Resource Type | Students Assigned | Students Used |
| 3 | Non-Embedded Print on Demand | ACC | 6 | 1 |
| 3 | Embedded Masking | DS | 38 | 3 |
| 4 | Non-Embedded Print on Demand | ACC | 7 | 1 |
| 4 | Embedded Masking | DS | 65 | 0 |

Table 5.6 *(continuation)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade | Support | Resource Type | Students Assigned | Students Used |
| 5 | Non-Embedded Print on Demand | ACC | 5 | 1 |
| 5 | Embedded Masking | DS | 67 | 1 |
| 6 | Non-Embedded Print on Demand | ACC | 9 | 0 |
| 6 | Embedded Masking | DS | 61 | 1 |
| 7 | Non-Embedded Print on Demand | ACC | 11 | 2 |
| 7 | Embedded Masking | DS | 44 | 0 |
| 8 | Non-Embedded Print on Demand | ACC | 4 | 0 |
| 8 | Embedded Masking | DS | 79 | 1 |
| 11 | Non-Embedded Print on Demand | ACC | 2 | 1 |
| 11 | Embedded Masking | DS | 32 | 0 |

Table 5.7 Summary of Accommodations and Designated Supports Used by Students—Mathematics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Grade | Support | Resource Type | Students Assigned | Students Used |
| 3 | Non-Embedded Print on Demand | ACC | 6 | 1 |
| 3 | Embedded Masking | DS | 38 | 0 |
| 4 | Non-Embedded Print on Demand | ACC | 7 | 0 |
| 4 | Embedded Masking | DS | 63 | 0 |
| 5 | Non-Embedded Print on Demand | ACC | 5 | 0 |
| 5 | Embedded Masking | DS | 68 | 1 |
| 6 | Non-Embedded Print on Demand | ACC | 9 | 0 |
| 6 | Embedded Masking | DS | 60 | 1 |
| 7 | Non-Embedded Print on Demand | ACC | 10 | 1 |
| 7 | Embedded Masking | DS | 42 | 0 |
| 8 | Non-Embedded Print on Demand | ACC | 4 | 0 |
| 8 | Embedded Masking | DS | 79 | 1 |
| 11 | Non-Embedded Print on Demand | ACC | 3 | 1 |
| 11 | Embedded Masking | DS | 31 | 0 |

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## Standard Setting

This chapter summarizes the standard setting process through which California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics achievement levels and threshold scores were recommended. Included are an overview of the standard setting methodology, a summary of the standard setting procedure, the description of the performance level descriptors (PLDs), and the results. The detailed standard setting information for the CAAs for ELA and mathematics is described in the *Standard-Setting Technical Report for the California Alternate Assessments* (ETS, 2016).

### Background

Standard setting refers to a class of methodologies by which one or more performance threshold scores are used to determine achievement levels. The purpose of the standard setting process for the CAAs was to collect recommendations from California educators for the placement of the CAA threshold scores for review by the California Department of Education (CDE), with final determination by the California State Board of Education (SBE). The content of the CAAs for ELA and mathematics is aligned to the Core Content Connectors (Connectors) that are derived from the Common Core State Standards (CCSS).

ETS conducted standard setting workshops in 2016, following the first operational administration of the CAAs for ELA and mathematics. The Bookmark standard setting method was applied to all items on each test, by grade. Refer to section [*6.3 Standard Setting Methodology*](#_Standard_Setting_Methodology) for more information about the Bookmark method.

Through the standard setting process, input and recommendations on performance standards are solicited from California educators and local educational agencies (LEAs). The CDE reviews the input and recommendations, and the SBE establishes the standards based on these recommendations. There are three achievement levels for each test per grade and content area. In order from low to high performance, these are: Level 1—Alternate, Level 2—Alternate, and Level 3—Alternate. Two achievement threshold scores are needed to define the three achievement levels. Students with scale scores lower than the threshold score for the Level 2—Alternate achievement level are assigned to the lowest achievement level, Level 1—Alternate. Students with scale scores that are equal to or greater than the threshold score for the Level 3—Alternate achievement level are assigned to the highest achievement level, Level 3—Alternate. The rest of the students with valid scores are assigned to Level 2—Alternate.

### Performance Level Descriptors

The CAAs for ELA and mathematics general (policy) PLDs, which were derived from the documents of the National Center and State Collaborative, describe what students at each performance level know and are able to do. General PLDs are short policy descriptors that convey the expectation at a given achievement level.

A team of LEA educators who are familiar with the Connectors and the target student population reviewed the general PLDs for California’s target student population. They developed more specific descriptions for each grade and content area using the CAA blueprints and the Connectors as resources. The grade- and content-specific PLDs, together with threshold scores and the assessment results, are accessible to educators, parents, students, and the public (CDE, 2016a and 2016b).

Table 6.1 provides a description of the three general PLDs, with Level 3 reflecting the highest level of achievement (CDE, 2019).

Table 6.1 Three General PLDs and CAAs for ELA and Mathematics Achievement Levels

|  |  |  |
| --- | --- | --- |
| Level | General PLDs | CAA Achievement Level |
| 3 | Students at this level demonstrate **understanding** of core subject matter in the content area. They are actively working with adapted grade-level content that focuses on the essential knowledge and skills and may need occasional prompts and assistance to complete tasks and activities. | Level 3—Alternate |
| 2 | Students at this level demonstrate **foundational** understanding of core subject matter in the content area when provided with frequent prompts and supports. They are actively working with adapted grade-level content that focuses on the essential knowledge and skills and may frequently need supports to complete tasks and activities. | Level 2—Alternate |
| 1 | Students at this level demonstrate **limited** understanding of adapted grade-level content that focuses on much of the basic knowledge and skills, even with extensive supports. | Level 1—Alternate |

### Standard Setting Methodology

For the CAAs for ELA and mathematics, the Bookmark method was used for standard setting. The Bookmark method is an item-mapping procedure that allows multiple performance threshold scores to be set in an efficient manner. This method represents an appropriate balance between statistical rigor and informed opinion, as explained in the following subsection.

#### Bookmark Method

The Bookmark method (Lewis, et al., 1998; Mitzel, et al., 2001) is a commonly used item-mapping procedure in which test items are ordered from easiest to most difficult based on actual student performance; the ordered items are presented in a booklet known as an ordered item booklet (OIB). The task of each panelist is to place a “bookmark” in the OIB that differentiates content that a student with just enough content knowledge and skills to be performing at a defined achievement level would likely know from content that the student would not likely know. A bookmark is placed in the OIB for each item defined at the border of each achievement level. For each CAA, two bookmarks were required to set three achievement levels: Level 1—Alternate, Level 2—Alternate, and Level 3—Alternate.

The Bookmark method has its basis in item response theory (IRT) analysis. IRT is used to estimate item difficulties. These estimates are used to order items from easiest to hardest and to place item difficulty estimates on the score scale. One benefit of this approach is that once panelists make judgments in the OIB, the difficulty values associated with each item have a built-in relationship to scale scores through theta, a fact that allows results to be provided to score users and policy makers on the familiar metric of the scale score.

### Standard Setting Procedures

This section describes what occurred prior to, and during, the standard setting workshop.

#### Panelists

Prior to the standard setting, panelists were recruited from across the state to be representative of the educators of CAA-eligible students; panelists were primarily special education teachers. Special efforts were made to assemble panels that were representative of the geographic and socioeconomic diversity of California in general and the CAA educator population in particular. The educators who participated in the standard setting included representatives from across regions in California (north, south, and central) and across gender, race, and ethnic categories. The final selection of panelists invited to the workshops was made by the CDE. The total number of panelists who participated was 68. Of these, 61 teachers have experience in special education, 43 administered the CAAs, and 7 were general education teachers.

#### Materials

Panelists were provided with a letter describing the purpose and procedure of the standard setting workshop along with a preworkshop assignment specific to their panel assignments, instructions, a note-taking form, and the links to the general PLDs and the CAA blueprints. During the workshop, panelists received training materials, a draft list of competencies to develop borderline student definitions, a set of operational materials, and evaluation forms. The set of operational materials included *Directions for Administration* for the assessment, the OIB, bookmark recording forms, and an item map. All references such as the CCSS, the Connectors, and the essential understandings were made available for panelists during the workshop. The detailed procedure with regard to securing those materials was described in the *Standard-Setting Technical Report for the California Alternate Assessments* (ETS, 2016).

#### Process

Prior to making judgments in the OIB, panelists reviewed and discussed the test blueprints and the SBE-approved PLDs, including the specific PLDs for each level, and then developed borderline student definitions as a group. Two borderline student definitions were developed, one for Level 2 and one for Level 3. For example, a borderline Level 2 student is a student at the beginning of Level 2; this student definition represents the knowledge and skills of the lowest-performing Level 2 student and differentiates this student from the knowledge and skills of the highest-performing Level 1 student.

Figure 6.1 shows where borderline students are located. This graph shows six figures representing students in the Level 1—Alternate group, six figures in the Level 2—Alternate Group, and six figures in the Level 3—Alternate Group. The arrow pointing to the leftmost figure in the Level 2 group indicates that this is the borderline Level 2 student. The arrow pointing to the leftmost figure in the Level 3 group indicates that this is the borderline Level 3 student.

Level 1—Alternate

Borderline Level 2 Student

Borderline Level 3 Student

Level 2—Alternate

Level 3—Alternate

Figure 6.1 Location of borderline students

To make judgments and place bookmarks in the OIB, panelists reviewed each item in the OIB in sequence and considered if the student at the beginning of Level 2, known as the borderline Level 2 student, would most likely be able to answer the item correctly. A panelist placed the Level 2 bookmark on the first item encountered in the OIB that the panelist believed the borderline Level 2 student would most likely not be able to address because items beyond that point were too difficult for that borderline student. The panelist continued from that point in the OIB and then stopped at the item that the borderline Level 3 student would not likely be able to address (i.e., the item that likely exceeds the ability of the borderline Level 3 student). Note that in the Bookmark method, the definition of “most likely” is related to the IRT model. That is, panelists were instructed to think of “most likely” as having a two-thirds likelihood of answering a multiple-choice item correctly. In ordering the items in the OIB, a response probability of 0.67 is employed in the IRT model; thus, the instructions to the panelists and the analytical model are aligned.7F[[7]](#footnote-8)

The Bookmark process was implemented in three rounds. Each test-specific panel was split up and seated in small groups at separate tables to facilitate discussion. This table format provided an environment more conducive to panelists’ sharing their opinions and rationales, as some panelists may be less inclined to speak or have less opportunity to be heard in a large group. The table format also increased the independence of the threshold-score recommendations, because each group of experts provided its own recommendations, which were then aggregated across groups.

The final recommended threshold scores were based on the median of panelists’ judgment scores. At the conclusion of the workshop, the results were shared with the panelists and the CDE.

As part of the standard setting process, the CDE analyzed the standard setting panel’s judgments and refined the threshold scores for consistency across all the CAAs for ELA and mathematics grade levels tested. The CDE’s recommendations were then presented to the SBE for approval.

### Results of the Standard Setting

The SBE approved the recommendation of the final threshold scores for the CAAs. The recommendations of the State Superintendent of Public Instruction (SSPI) are presented in table 6.2 (ELA) and table 6.3 (mathematics). The scales in these tables were presented and used in the standard setting process. They range from 50 to 350 score points and are more user-friendly than the theta metric. The theta score was not used because panelists might not be familiar with the concept of theta. As the theta scores range from -6.00 to 6.00 approximately, it was less accessible to panelists as well. As a result, the theta scale was transformed linearly to a score scale unique to each grade.

The tables show the percent of students statewide that would be placed at this alternate achievement standard (level) on the basis of the results of the 2015–2016 CAASPP administration. Also shown in both tables is the percentage of students statewide that would be at or above this alternate achievement standard (level) on the basis of the results of the 2015–2016 administration. Finally, the standard setting threshold score is the minimum standard setting scale score needed to achieve an alternate achievement standard (level) on the 2015–2016 administration of tests. Note that threshold scores were generated solely for the standard setting process; reporting scales were developed to report scores on the Student Score Report and public reporting.

Table 6.2 SSPI’s Recommendations for the Proposed Achievement Standards (Levels) for the CAA for ELA

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | Percent of Students in Level 1 | Percent at or Above in Level 1 | Percent of Students in Level 2 | Standard Setting Scale Threshold Score for Level 2 | Percent at or Above in Level 2 | Percent of Students in Level 3 | Standard Setting Scale Threshold Score for Level 3 | Percent at or Above in Level 3 |
| 3 | 54.3 | 100 | 24.7 | 195 | 45.7 | 21.0 | 220 | 21.0 |
| 4 | 60.6 | 100 | 27.8 | 200 | 39.4 | 11.6 | 225 | 11.6 |
| 5 | 57.0 | 100 | 34.5 | 200 | 43.0 | 8.5 | 225 | 8.5 |
| 6 | 57.0 | 100 | 36.2 | 200 | 43.0 | 6.8 | 230 | 6.8 |
| 7 | 59.4 | 100 | 32.2 | 200 | 40.6 | 8.4 | 225 | 8.4 |
| 8 | 49.4 | 100 | 43.0 | 195 | 50.6 | 7.5 | 225 | 7.5 |
| 11 | 46.0 | 100 | 46.8 | 195 | 54.0 | 7.1 | 225 | 7.1 |

Table 6.3 SSPI’s Recommendations for the Proposed Achievement Standards (Levels) for the CAA for Mathematics

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | Percent of Students in Level 1 | Percent at or Above in Level 1 | Percent of Students in Level 2 | Standard Setting Scale Threshold Score for Level 2 | Percent at or Above in Level 2 | Percent of Students in Level 3 | Standard Setting Scale Threshold Score for Level 3 | Percent at or Above in Level 3 |
| 3 | 72.3 | 100 | 23.1 | 205 | 27.7 | 4.6 | 225 | 4.6 |
| 4 | 70.0 | 100 | 25.8 | 205 | 30.0 | 4.3 | 225 | 4.3 |
| 5 | 72.8 | 100 | 23.0 | 205 | 27.2 | 4.2 | 225 | 4.2 |
| 6 | 72.7 | 100 | 23.2 | 205 | 27.3 | 4.1 | 225 | 4.1 |
| 7 | 70.4 | 100 | 24.4 | 205 | 29.6 | 5.2 | 225 | 5.2 |
| 8 | 71.1 | 100 | 24.5 | 205 | 28.9 | 4.4 | 225 | 4.4 |
| 11 | 68.4 | 100 | 26.2 | 205 | 31.6 | 5.4 | 225 | 5.4 |

The reporting scale score range for each achievement level at different grades is presented in table 7.2. The performance threshold score for each level is the lower bound of each scale score range. The scale score ranges do not change from year to year. Once established, they remain unchanged from administration to administration until such time that new performance standards are adopted. Table 7.4 in [chapter 7](#_Scoring_and_Reporting) presents the percentage of students meeting each achievement level in the 2020–2021 administration of the CAA for ELA; table 7.5 presents this data for the CAA for Mathematics.

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## Scoring and Reporting

Student item responses were scored and analyzed to determine individual students’ scores for the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics. Individual student scores (i.e., overall scale scores) were calculated and reported on the basis of the analyses of the item responses. In addition, student test scores were aggregated to produce summary reports for schools and local educational agencies (LEAs).

This chapter describes how the various types of student responses were scored for the CAAs for ELA and mathematics computer-based assessments, as well as the various types of scores and reports that were generated.

### Student Test Scores

Overall scale scores and achievement levels for the CAAs for ELA and mathematics are reported at the individual student level. To obtain these overall scale scores and achievement levels, the ability (theta) scores need to be estimated.

Prior to the test administration, ETS Assessment and Learning Technology Research & Development staff reviewed each item and determined the keys and scoring rubrics. The keys were provided to Cambium Assessment, Inc. (CAI) for implementation in the test delivery system (TDS). A few items on the assessment were scored by the test examiner using rubrics provided in the *Directions for Administration*. On the day of testing, the test examiner observed and scored the student’s response using the rubric, and then entered the score for the item into the TDS. After CAI finished machine-scoring item responses, rubric scores and responses were delivered to ETS. ETS processed all results, which included enacting procedures to ensure the completeness and accuracy of the student score records, before reporting student scores to the California Department of Education (CDE), LEAs, and parents/guardians.

ETS used two parallel scoring systems to produce and verify students’ scores. The Enterprise Score Key Management scoring system received individual students’ item scores and item responses from CAI and computed individual student scores for the ETS reporting system. ETS’ Psychometric Analysis & Research team also computed individual student scores based on the same data files using statistical analysis system software. The scores from the two systems were then compared for the purpose of internal quality control. Inconsistency in the total raw scores was investigated and resolved. The parallel scoring process ensured the quality and accuracy of scoring and supported the transfer of scores into the database of the student records scoring system, the Test Operations Management System (TOMS).

#### Scoring of Incomplete Cases

Whether a test should be scored or reported depended on the “complete” status of the test and how much of the test was submitted for scoring. Depending on the nature of the missing data, different actions were taken.

As defined in the CAA scoring and reporting specifications, a student’s test was considered “complete” if the student responded to a minimum of four items; “partially complete” if the student responded to one to three items; and “non-complete” if the student logged on but did not respond to any item.

ETS, in consultation with the CDE, implemented several rules to identify an incomplete test; these rules are presented in table 7.1, which includes rules for determining

* whether a student’s test is considered attempted or taken,
* whether a student’s test is scored,
* whether a student’s test is considered complete, and
* whether a student’s score is reported.

Table 7.1 Rules for Incomplete Tests

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If the student | Classify the student as taking the test? | Score the student’s responses? | Classify the student as attempting the test (test completion status) or is there another status? | Report a score for the student? |
| Logged on to the test but answered no items | Yes | Yes, lowest obtainable scale score (LOSS) for the test | Yes, INC0 (Noncompletion) | Yes |
| Logged on to the test and answered at least one item but not more than three items | Yes | Yes, next lowest obtainable scale score for the test (LOSS+1) | Yes, INC1 (Partial completion) | Yes |
| Logged on to the test and answered at least four items | Yes | Yes | Yes (Completion) | Yes |
| Did not log on to the test | No | N/A | Not Tested | No |
| Logged on and answered at least one item with a special condition code (refer to subsection [*7.3.2 Special Cases*](#_Special_Cases)*)* | No | N/A | Not Tested | No |

#### Theta Scores

The CAAs for ELA and mathematics use a two-stage multistage test (MST) design; refer to section [*4.2 Test Design*](#_Test_Design) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2)for details about the MST design. Based on this design, there were two pathways (combinations) of Stage 1 and Stage 2 modules; each pathway consisting of a Stage 1 module and a Stage 2 module is illustrated in table 4.2.

A student’s raw score is the sum of scores on the individual items presented to the student. The test for each grade and content area has its own theta scale. If all the items presented to the student were calibrated onto that theta scale, the student’s raw score could be transformed into an ability (theta) estimate by using the item response theory (IRT) inverse test characteristic curve (TCC) method (Stocking, 1996). With this method, the student’s estimated ability is the ability value at which the expected raw score is equal to the student’s raw score. Refer to subsection [*8.3.2 Equating*](#_Equating) for equating procedures and the IRT inverse TCC method.

When a conversion table from the raw score to theta score was created for each pathway (i.e., each combination of Stage 1 and Stage 2 modules), the estimated ability (theta) score of each individual student could be obtained from the conversion table. The theta score could later be transformed into a scale score through a linear transformation. Refer to [appendix 7.B](#_Appendix_7.B:_Raw) for the raw-to-scale score conversion tables.

#### Scale Scores for the Total Assessment

The following requirements were used to develop and define the CAAs for ELA and mathematics reporting scale ranges:

1. Each scale score has three digits (e.g., 320, 551, or 780), where the first digit is indicative of the grade being reported. The leading digit is defined by the grade for elementary and middle school, while the high school leading digit is set to “9.” The latter two digits represent the scale score as derived from the transformation from the raw scores to the scale scores as described in the previous subsection.
2. Score ranges are grade-specific. For example, the possible scale scores would be 300 to 399 for grade three with the LOSS at 300 and the highest obtainable scale score (HOSS) at 399. For grade four, this range is 400 to 499 with a LOSS of 400 and a HOSS of 499, and so on for the other grades. For grade eleven, the scale ranges from 900 to 999 with a LOSS of 900 and a HOSS of 999.
3. Each threshold score on the scale is the same from year to year. Also, across the grade levels, the last two digits corresponding to the Level 2—Alternate and Level 3—Alternate threshold scores are the same (refer to subsection [*7.1.4 Achievement Levels*](#_Achievement_Levels)for a brief description of alternate achievement levels).
4. Students with incomplete tests, as shown in table 7.1, have two possible scale scores. If a student logged on to the TDS but did not answer any items (INC0), this student would be assigned a scale score of LOSS (e.g., 300 for a grade three student and 400 for a grade four student). If a student logged on to the TDS and answered at least one but fewer than four items (INC1), the student would be assigned a scale score of LOSS+1 (i.e., 301 for a grade three student and 401 for a grade four student).

For students who complete a CAA, their scale scores cannot be lower than LOSS+3 or higher than the HOSS as a result of truncation in the scale score transformation listed in table 8.3. For example, the scale scores for grade three are truncated at a minimum of 303 and a maximum of 399. As a result, the range of student ability estimates [-‍6, +6] are transformed to the scale score range [303, 399] for grade three and [403, 499] for grade four. The scale score ranges for other grades follow the same pattern.

In addition to the special requirements of the CAA reporting scale, an equating procedure was implemented to place scores from different forms or administrations onto the reference scales to make scores comparable.

First, to express the students’ ability estimates on the scale score metric of CAAs, the inverse TCC procedure was used to convert each possible raw score to an ability estimate (theta score). Refer to subsection [*8.3.2.3.1 Inverse Test Characteristic Curve Procedure*](#_Inverse_Test_Characteristic) for details of this procedure.

Second, theta scores were transformed linearly to the appropriate score scale. Refer to subsection [*8.3.2.3.2 Transformation from Theta Scores to Scale Scores*](#_Transformation_from_Theta) for details of the transformation. The slopes and intercepts for such linear transformations are presented in table 8.3. Once the theta scores were transformed, the theta-to-scale score relationship could be mapped to the raw scores.

Finally, the raw-to-scale score conversion tables were established. The complete raw-to-scale score conversion tables for each CAA pathway are presented in table 7.B.1 through table 7.B.14 in [appendix 7.B](#_Appendix_7.B:_Raw). The raw scores and transformed scale scores at each raw score are listed in those tables. Refer to table 4.A.1 through table 4.A.14 in [*Appendix 4.A: Test Blueprints Alignment by CAA Form*](#_Appendix_4.A:_Test) for pathways of each test.

The distributions of estimated theta scores for all students tested in each grade and content area are presented in table 7.A.1 and table 7.A.2 in [appendix 7.A](#_Appendix_7.A:_Theta). To compare the ability distributions across pathways, the estimated theta score distributions for each grade, content area, and test pathway are presented in table 7.A.3 through table 7.A.16. The theta distributions show the ability differences between students taking different pathways.

#### Achievement Levels

CAA reporting scales classify each student’s performance into one of the three achievement levels,8F[[8]](#footnote-9) with Level 1—Alternate indicating the lowest level of performance and Level 3—Alternate indicating the highest level of performance. The range of possible scale scores is divided into three achievement levels. Student test results are reported in the following overall achievement levels:

* **Level 1—Alternate:** The student demonstrates a limited understanding of core concepts in ELA and mathematics.
* **Level 2—Alternate:** The student demonstrates a foundational understanding of core concepts in ELA and mathematics.
* **Level 3—Alternate:** The student demonstrates an understanding of core concepts in ELA and mathematics.

The scale score ranges defining the various achievement levels and grades are presented in table 7.2.

Table 7.2 CAAs for ELA and Mathematics Reporting Scale Score Ranges for Each Achievement Level and Grade

|  |  |  |  |
| --- | --- | --- | --- |
| Grade | Level 1—Alternate | Level 2—Alternate | Level 3—Alternate |
| 3 | 300–344 | 345–359 | 360–399 |
| 4 | 400–444 | 445–459 | 460–499 |
| 5 | 500–544 | 545–559 | 560–599 |
| 6 | 600–644 | 645–659 | 660–699 |
| 7 | 700–744 | 745–759 | 760–799 |
| 8 | 800–844 | 845–859 | 860–899 |
| 11 | 900–944 | 945–959 | 960–999 |

### Overview of Score Aggregation Procedures

To provide meaningful results to interested educators, test scores for a given grade and content area were aggregated at the school, LEA or direct funded charter school, county, and state levels. The aggregated scores were generated for the selected groups of interest (gender, ethnicity, primary disability, etc.) and for the total population. This section contains a description of the types of aggregation that were performed on the CAAs for ELA and mathematics summary test scores.

#### Individual Student Score Distributions and Summary Statistics

Summary statistics that describe student performance on each test are presented in table 7.3. Included in the table are the number of students taking each test and the means and standard deviations of student scores expressed in terms of scale scores. Approximately 4,000 students per grade and content area were assigned to take the CAAs for ELA and mathematics during the 2020–2021 administration. However, because of the impact of the novel coronavirus disease 2019 (COVID-19) pandemic, less than half of the students registered actually tested.

Table 7.3 Mean and Standard Deviation (SD) of Scale and Theta Scores

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Students Tested | Scale Score Mean | Scale Score SD | Theta Score Mean | Theta Score SD |
| ELA 3 | 1,581 | 341 | 25 | -0.94 | 2.54 |
| ELA 4 | 1,701 | 437 | 22 | -0.94 | 2.31 |
| ELA 5 | 1,694 | 541 | 23 | -0.64 | 2.31 |
| ELA 6 | 1,653 | 642 | 21 | -0.52 | 2.21 |
| ELA 7 | 1,582 | 742 | 21 | -0.55 | 2.21 |
| ELA 8 | 1,547 | 843 | 19 | -0.60 | 2.11 |
| ELA 11 | 1,360 | 943 | 21 | -0.65 | 2.26 |

Table 7.3 *(continuation)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Students Tested | Scale Score Mean | Scale Score SD | Theta Score Mean | Theta Score SD |
| Mathematics 3 | 1,561 | 332 | 21 | -1.22 | 2.45 |
| Mathematics 4 | 1,685 | 432 | 21 | -1.06 | 2.24 |
| Mathematics 5 | 1,672 | 535 | 20 | -0.91 | 2.19 |
| Mathematics 6 | 1,630 | 636 | 21 | -0.91 | 2.36 |
| Mathematics 7 | 1,562 | 738 | 22 | -0.65 | 2.19 |
| Mathematics 8 | 1,527 | 839 | 22 | -0.65 | 2.27 |
| Mathematics 11 | 1,336 | 936 | 22 | -0.93 | 2.36 |

The number and percentage of students at each achievement level for the CAA for ELA is presented in table 7.4. 9F[[9]](#footnote-10)

Table 7.4 Numbers and Percentages of Students in Each CAA for ELA Achievement Level

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Level 1 N | Level 1 % | Level 2 N | Level 2 % | Level 3 N | Level 3 % |
| ELA 3 | 782 | 49% | 441 | 28% | 358 | 23% |
| ELA 4 | 955 | 56% | 526 | 31% | 220 | 13% |
| ELA 5 | 868 | 51% | 504 | 30% | 322 | 19% |
| ELA 6 | 736 | 45% | 671 | 41% | 246 | 15% |
| ELA 7 | 668 | 42% | 600 | 38% | 314 | 20% |
| ELA 8 | 632 | 41% | 743 | 48% | 172 | 11% |
| ELA 11 | 531 | 39% | 608 | 45% | 221 | 16% |

Figure 7.1, which is derived from the data in table 7.4, presents the percentage of students at each achievement level by grade for ELA. More students are at Level 1 than Level 2 or Level 3 for ELA, and Level 3 has the smallest number of students. Between ELA and mathematics, the ELA assessments have more students at Level 3 and fewer students at Level 1 than the mathematics assessments.

Figure 7.1 Percentage of students at each achievement level in ELA

The number and percentage of students at each achievement level for the CAA for Mathematics is presented in table 7.5. 9F[[10]](#footnote-11)

Table 7.5 Numbers and Percentages of Students in Each CAA for Mathematics Achievement Level

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Level 1 N | Level 1 % | Level 2 N | Level 2 % | Level 3 N | Level 3 % |
| Mathematics 3 | 1,096 | 70% | 371 | 24% | 94 | 6% |
| Mathematics 4 | 1,152 | 68% | 435 | 26% | 98 | 6% |
| Mathematics 5 | 1,102 | 66% | 481 | 29% | 89 | 5% |
| Mathematics 6 | 1,028 | 63% | 437 | 27% | 165 | 10% |
| Mathematics 7 | 880 | 56% | 489 | 31% | 193 | 12% |
| Mathematics 8 | 901 | 59% | 407 | 27% | 219 | 14% |
| Mathematics 11 | 824 | 62% | 368 | 28% | 144 | 11% |

Figure 7.2, which is derived from the data in table 7.5, presents the percentage of students at each achievement level by grade for mathematics. More students are at Level 1 than Level 2 or Level 3 for mathematics, and Level 3 has the smallest number of students. Between ELA and mathematics, the mathematics assessments have fewer students at Level 3 and more students at Level 1 than the ELA assessments.

Figure 7.2 Percentage of students at each achievement level in mathematics

The selected percentiles of the scale score distributions are presented in table 7.C.1 and table 7.C.2 in [appendix 7.C](#_Appendix_7.C:_Scale). CAA reporting scale score distribution information for each grade and content area is available in table 7.C.3 through table 7.C.16.

#### Demographic Student Group Scores

Statistics summarizing student performance by content area and grade level for selected groups of students are reported in table 7.D.1 through table 7.D.14 of [appendix 7.D](#_Appendix_7.D:_Demographic). The students are grouped by demographic characteristics, including gender, ethnicity, English language fluency, economic status (disadvantaged or not), primary disability, migrant status, and ethnicity by economic status. For each demographic student group, the number of students with a valid scale score, scale score means and standard deviations, and the percentage of students in each achievement level are included in the tables.

Table 7.6 provides definitions of the demographic student groups. To protect student privacy, when the number of students in a student group is 10 or fewer, the summary statistics are not reported and are presented as “N/A.”

Table 7.6 Demographic Student Groups to Be Reported

|  |  |
| --- | --- |
| Category | Student Groups |
| **Economic Status** | * Not economically disadvantaged * Economically disadvantaged |
| **English Language Fluency** | * English only * Initial fluent English proficient (IFEP) * English learner (EL) * Reclassified fluent English proficient (RFEP) * Adult English learner (ADEL) * To be determined * English proficiency unknown |
| **Ethnicity** | * American Indian or Alaska Native * Asian * Native Hawaiian or Other Pacific Islander * Filipino * Hispanic or Latino * Black or African American * White * Two or more races |
| **Gender** | * Male * Female * Nonbinary |
| **Migrant Status** | * Eligible for the Title I Part C Migrant Program (Migrant education) * Not eligible for the Title I Part C Migrant Program (Not migrant education) |

Table 7.6 *(continuation)*

|  |  |
| --- | --- |
| Category | Student Groups |
| **Primary Disability Type** | * Intellectual disability * Hearing impairment * Speech or language impairment * Visual impairment * Emotional disturbance * Orthopedic impairment * Other health impairment * Specific learning disability * Deaf-blindness * Multiple disabilities * Autism * Traumatic brain injury |

### Reports Produced and Scores for Each Report

Score summaries are reported for different purposes for the CAAs for ELA and mathematics computer-based assessments. The four major purposes are to

1. help facilitate conversations between parents/guardians and teachers about student performance,
2. serve as a tool to help parents/guardians and teachers work together to improve student learning,
3. help schools and LEAs identify strengths and areas that need improvement in their educational programs, and
4. provide the public and policymakers with information about student achievement.

This section provides detailed descriptions of the uses and applications of the California Assessment of Student Performance and Progress (CAASPP) reporting for students. CAAs for ELA and mathematics, as one of the components in the CAASPP, are reported through the CAASPP reporting system.

#### Online Reporting

TOMS is a secure website hosted by ETS that permits LEA users to manage the CAASPP computer-based summative assessments and to inform the TDS. This system uses a role-specific design to restrict access to certain tools and applications based on the user’s designated role.

Specific functions of TOMS include the following:

* Manage user access privileges
* Manage test administration calendars and testing windows
* Manage student test assignments
* Manage and confirm the accuracy of students’ test settings (i.e., designated supports and accommodations) prior to testing
* Generate and download various reports

In addition to TOMS, another California online reporting system used during the 2020–2021 administration was the California Educator Reporting System (CERS). CERS provided preliminary score data for each administered test available in the reporting system.

Based on the CAASPP reporting requirements, CERS provided the preliminary summative reports containing information outlining student knowledge and skills. CERS also permitted access to individual score reports, which provided preliminary score data for each administered test available in the reporting system. The online aggregated reports were available to be downloaded in PDF, Excel, and comma-separated value formats.

CERS was the primary source for LEA staff to analyze CAA results at the LEA, school, grade, classroom, or customized group level. CERS provided these reports, which can be downloaded to plan instruction. LEA staff with TOMS logon credentials could enter CERS through the CAASPP website to access student assessment results.

#### Special Cases

Student scores were not reported for the following cases:

* The student had a medical emergency during testing
* The student’s parent/guardian requested exemption from testing
* The student did not log on to test systems
* The student score was invalidated in the system (not reported in aggregated reporting)

#### Types of Score Reports

There are two categories of CAASPP reports. The specific reports within each category are presented in this subsection.

* **SSR—**The SSR was the official score report for parents and guardians. An SSR described the student’s results.
* **LEA student data files and aggregations—**LEA student data files were available for download on demand by the LEA in TOMS to coincide with availability of the SSRs.

##### Student Score Report

The CAA Student Score Report (SSR) is the official score report for parents/guardians includes the following metrics:

* Reported scale scores (The ranges of scale scores are provided in table 7.2.)
* Reported achievement levels for both ELA and mathematics (CAA achievement levels are “Level 1—Alternate,” “Level 2—Alternate,” and “Level 3—Alternate.”)

Scores for students who were assigned accommodations or designated supports are reported in the same way as for students who were not assigned accommodations or designated supports. Detailed information about accessibility resources is presented in subsection [*2.5.1 Universal Tools, Designated Supports, and Accommodations*](#_Universal_Tools,_Designated_1) in [chapter 2](#_Overview_of_the).

LEAs had three options for accessing and distributing SSRs to parents/guardians:

1. Accessing electronic SSR PDFs using a locally provided parent/guardian or student portal
2. Downloading SSR PDFs from TOMS and making them available electronically using a secure local method
3. Downloading SSR PDFs from TOMS, printing them, and making them available locally

The LEA CAASPP coordinator could forward the appropriate reports to test sites. In the case of a locally printed CAA SSR, the LEA sent the printed report(s) to the child’s parent or guardian. CAA SSRs that included individual student results were not distributed beyond the student’s school.

Further information about the CAA SSR and its interpretation is provided on the Smarter Balanced Starting Smarter website for California assessments.

###### Access via Student or Parent Portal

LEAs had the option to provide SSRs electronically using a locally provided parent or student portal.

Amazon Web Services—with the Amazon Simple Storage Service and the Amazon Key Management Service—ensured encrypted access for parents/guardians to view a child’s electronic SSR, which was available as a PDF.

###### Access via the Test Operations Management System

The LEA CAASPP coordinator downloaded the electronic PDFs directly from TOMS and could forward the appropriate reports to test sites. Optionally, the LEA could download and then print the SSR PDF and then send the printed report(s) to the child’s parent/guardian.

##### Local Educational Agency Student Data Files and Aggregations

The CAASPP student data files for the LEA were available for the LEA CAASPP coordinator and CAASPP test site coordinator to download from TOMS.

Preliminary student score aggregations were also available to LEAs prior to the release of final reports via electronic reporting, accessed using CERS. This website permitted LEAs to view preliminary results for all tests taken.

Current and historical aggregated results are accessible to the public on the CDE Test Results for California’s Assessments website.

Note that for 2020–2021, these are partial results and caution should be taken, as they may not be an accurate representation of a school or LEA’s performance.

#### Score Report Applications

CAAs for ELA and mathematics test results provided parents/guardians with information about their child’s progress. The results were one tool for increasing communication and collaboration between parents/guardians and teachers about how to identify priorities to help the student progress in ELA and mathematics. They provided limited information about one measure of a student’s academic performance. Like any important measure of student performance, the test results should be viewed with other available information such as progress on individualized education program goals, assignments, and teacher conferences.

Schools could use the CAAs for ELA and mathematics results to help make decisions about how to support student achievement. CAA results, however, should never be used as the only source of information to make important decisions about a child’s education.

CAAs for ELA and mathematics results helped schools and LEAs identify strengths and weaknesses in their instructional programs. Each year, staff from schools and LEAs examine CAA test results at each grade level and content area tested. Their findings are used to help determine

* the extent to which students are learning the alternate achievement standards,
* instructional areas that can be improved,
* teaching strategies that can be developed to address the needs of students, and
* decisions about how to use funds to help ensure that students achieve the alternate achievement standards.

#### Criteria for Interpreting Test Scores

LEAs may use the CAA results to help inform decisions around instructional needs, but the CAA results should not be used in isolation to make inferences about instructional needs. It is important to remember that results from a single test can provide only limited information. Other relevant information should be considered as well. It is advisable for parents/‌ guardians to evaluate their child’s strengths and weaknesses in the relevant topics by reviewing classroom work and progress reports in addition to the student’s CAAs for ELA and mathematics results. It is also important to note that a student’s score in a content area contains measurement error and could vary to some extent if the student were retested.

#### Criteria for Interpreting Score Reports

The information presented in various reports must be interpreted with caution when making performance comparisons. When comparing scale scores and achievement-level results, the user is limited to the comparisons within a content area and grade level. The score scales for ELA and mathematics are not comparable to each other, nor are the score scales comparable across grade levels. The user may compare scale scores for the same content area and grade level, within a school, between schools or between a school and its LEA, its county, or the state. For more details on the criteria for interpreting information provided on the score reports, refer to the *CAASPP Post-Test Guide* (CDE, 2021).

### References

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Educational Testing Service. (2016). *Standard-setting technical report for the California Alternate Assessments: English language arts/literacy and mathematics grades three through eight and grade eleven.* Princeton, NJ: Educational Testing Service.

Stocking, M. L. (1996). An alternative method for scoring adaptive tests. *Journal of Educational and Behavioral Statistics, 21*, 365–89.

### Appendix 7.A: Theta Scores (Estimated Ability Values) of Students Taking Each Test

**Note:** An expression that opens with a parenthesis and closes with a bracket indicates that a value is greater than the first number and is less than or equal to the second number. For example, “(0.5, 2]” indicates a value greater than 0.5 but less than or equal to 2.

Table 7.A.1 Frequency Distribution of Theta for Overall Scores—ELA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Theta Score | Grade 3 | Grade 4 | Grade 5 | Grade 6 | Grade 7 | Grade 8 | Grade 11 |
| Incomplete | 267 | 265 | 204 | 205 | 196 | 186 | 187 |
| [-6.0, -6.0] | 1 | N/A | N/A | 1 | 1 | 1 | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | 9 | N/A | N/A | N/A | N/A |
| (-5.0, -4.5] | 5 | 4 | N/A | 6 | 3 | 3 | 7 |
| (-4.5, -4.0] | 18 | N/A | 27 | N/A | 11 | 3 | N/A |
| (-4.0, -3.5] | 7 | 18 | 22 | 9 | 2 | 11 | 14 |
| (-3.5, -3.0] | 19 | 20 | 11 | 21 | N/A | 5 | 7 |
| (-3.0, -2.5] | 18 | 17 | 10 | 10 | 12 | 13 | 9 |
| (-2.5, -2.0] | 20 | 32 | 19 | 24 | 13 | 11 | 14 |
| (-2.0, -1.5] | 43 | 39 | 29 | 33 | 26 | 26 | 29 |
| (-1.5, -1.0] | 85 | 103 | 126 | 70 | 59 | 33 | 46 |
| (-1.0, -0.5] | 170 | 223 | 186 | 165 | 190 | 132 | 111 |
| (-0.5, 0.0] | 245 | 285 | 225 | 266 | 212 | 328 | 193 |
| (0.0, 0.5] | 270 | 217 | 314 | 324 | 298 | 314 | 266 |
| (0.5, 1.0] | 168 | 258 | 190 | 208 | 313 | 311 | 259 |
| (1.0, 1.5] | 85 | 104 | 124 | 174 | 145 | 111 | 142 |
| (1.5, 2.0] | 80 | 68 | 124 | 84 | 69 | 28 | 55 |
| (2.0, 2.5] | 29 | 37 | 28 | 30 | 17 | 24 | 17 |
| (2.5, 3.0] | 23 | 7 | 28 | 12 | 8 | 5 | 4 |
| (3.0, 3.5] | 19 | N/A | 14 | N/A | 5 | 2 | N/A |
| (3.5, 4.0] | N/A | 3 | N/A | 10 | 2 | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (5.5, 6.0] | 9 | 1 | 4 | 1 | N/A | N/A | N/A |

Table 7.A.2 Frequency Distribution of Theta for Overall Scores—Mathematics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Theta Score | Grade 3 | Grade 4 | Grade 5 | Grade 6 | Grade 7 | Grade 8 | Grade 11 |
| Incomplete | 317 | 277 | 252 | 270 | 202 | 211 | 223 |
| [-6.0, -6.0] | 2 | N/A | 3 | 1 | 6 | 1 | 2 |
| (-6.0, -5.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | 5 | N/A | N/A | N/A | N/A | N/A |
| (-4.0, -3.5] | 15 | 10 | 7 | 10 | 16 | 7 | 8 |
| (-3.5, -3.0] | N/A | 25 | 13 | N/A | 37 | 15 | 2 |
| (-3.0, -2.5] | 34 | 4 | 27 | 28 | 4 | 13 | 9 |
| (-2.5, -2.0] | 15 | 25 | 21 | 8 | 11 | 4 | 7 |
| (-2.0, -1.5] | 20 | 32 | 18 | 13 | 11 | 14 | 18 |
| (-1.5, -1.0] | 53 | 114 | 35 | 42 | 18 | 18 | 60 |
| (-1.0, -0.5] | 172 | 221 | 153 | 115 | 137 | 145 | 155 |
| (-0.5, 0.0] | 271 | 313 | 475 | 350 | 356 | 309 | 238 |
| (0.0, 0.5] | 365 | 372 | 327 | 441 | 314 | 336 | 295 |
| (0.5, 1.0] | 203 | 189 | 252 | 187 | 257 | 235 | 175 |
| (1.0, 1.5] | 65 | 55 | 63 | 110 | 105 | 104 | 84 |
| (1.5, 2.0] | 14 | 31 | 16 | 27 | 60 | 75 | 45 |
| (2.0, 2.5] | 8 | 2 | 6 | 17 | 16 | 29 | 14 |
| (2.5, 3.0] | 5 | 2 | 2 | 7 | 6 | 9 | 1 |
| (3.0, 3.5] | N/A | 4 | 2 | 1 | N/A | 1 | N/A |
| (3.5, 4.0] | N/A | 2 | N/A | N/A | N/A | N/A | N/A |
| (4.0, 4.5] | 1 | N/A | N/A | 3 | 5 | 1 | N/A |
| (4.5, 5.0] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| (5.5, 6.0] | 1 | 2 | N/A | N/A | 1 | N/A | N/A |

Table 7.A.3 Frequency Distribution of Theta by Pathway—ELA, Grade Three

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 265 | 2 | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 5 | N/A | N/A |
| (-4.5, -4.0] | 18 | N/A | N/A |
| (-4.0, -3.5] | 3 | 4 | N/A |
| (-3.5, -3.0] | 7 | 12 | N/A |
| (-3.0, -2.5] | 2 | 16 | N/A |
| (-2.5, -2.0] | 1 | 19 | N/A |
| (-2.0, -1.5] | 1 | 36 | 6 |
| (-1.5, -1.0] | N/A | 74 | 11 |
| (-1.0, -0.5] | N/A | 95 | 75 |
| (-0.5, 0.0] | N/A | 37 | 208 |
| (0.0, 0.5] | N/A | 4 | 266 |
| (0.5, 1.0] | N/A | N/A | 168 |
| (1.0, 1.5] | N/A | N/A | 85 |
| (1.5, 2.0] | N/A | N/A | 80 |
| (2.0, 2.5] | N/A | N/A | 29 |
| (2.5, 3.0] | N/A | N/A | 23 |
| (3.0, 3.5] | N/A | N/A | 19 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 9 |

Table 7.A.4 Frequency Distribution of Theta by Pathway—ELA, Grade Four

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 265 | N/A | N/A |
| [-6.0, -6.0] | N/A | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 4 | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 18 | N/A | N/A |
| (-3.5, -3.0] | 11 | 9 | N/A |
| (-3.0, -2.5] | 3 | 14 | N/A |
| (-2.5, -2.0] | 4 | 28 | N/A |
| (-2.0, -1.5] | 8 | 31 | N/A |
| (-1.5, -1.0] | 2 | 96 | 5 |
| (-1.0, -0.5] | N/A | 204 | 19 |
| (-0.5, 0.0] | N/A | 167 | 118 |
| (0.0, 0.5] | N/A | 40 | 177 |
| (0.5, 1.0] | N/A | 1 | 257 |
| (1.0, 1.5] | N/A | N/A | 104 |
| (1.5, 2.0] | N/A | N/A | 68 |
| (2.0, 2.5] | N/A | N/A | 37 |
| (2.5, 3.0] | N/A | N/A | 7 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | 3 |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 1 |

Table 7.A.5 Frequency Distribution of Theta by Pathway—ELA, Grade Five

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 204 | N/A | N/A |
| [-6.0, -6.0] | N/A | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | 9 | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | 27 | N/A | N/A |
| (-4.0, -3.5] | 22 | N/A | N/A |
| (-3.5, -3.0] | 6 | 5 | N/A |
| (-3.0, -2.5] | 3 | 7 | N/A |
| (-2.5, -2.0] | 2 | 17 | N/A |
| (-2.0, -1.5] | 2 | 27 | N/A |
| (-1.5, -1.0] | 1 | 115 | 10 |
| (-1.0, -0.5] | N/A | 158 | 28 |
| (-0.5, 0.0] | N/A | 74 | 151 |
| (0.0, 0.5] | N/A | 37 | 277 |
| (0.5, 1.0] | N/A | N/A | 190 |
| (1.0, 1.5] | N/A | N/A | 124 |
| (1.5, 2.0] | N/A | N/A | 124 |
| (2.0, 2.5] | N/A | N/A | 28 |
| (2.5, 3.0] | N/A | N/A | 28 |
| (3.0, 3.5] | N/A | N/A | 14 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 4 |

Table 7.A.6 Frequency Distribution of Theta by Pathway—ELA, Grade Six

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 205 | N/A | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 6 | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 9 | N/A | N/A |
| (-3.5, -3.0] | 21 | N/A | N/A |
| (-3.0, -2.5] | 3 | 7 | N/A |
| (-2.5, -2.0] | 9 | 15 | N/A |
| (-2.0, -1.5] | 5 | 28 | N/A |
| (-1.5, -1.0] | 1 | 58 | 11 |
| (-1.0, -0.5] | N/A | 98 | 67 |
| (-0.5, 0.0] | N/A | 33 | 233 |
| (0.0, 0.5] | N/A | 5 | 319 |
| (0.5, 1.0] | N/A | N/A | 208 |
| (1.0, 1.5] | N/A | N/A | 174 |
| (1.5, 2.0] | N/A | N/A | 84 |
| (2.0, 2.5] | N/A | N/A | 30 |
| (2.5, 3.0] | N/A | N/A | 12 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | 10 |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 1 |

Table 7.A.7 Frequency Distribution of Theta by Pathway—ELA, Grade Seven

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 195 | 1 | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 3 | N/A | N/A |
| (-4.5, -4.0] | 11 | N/A | N/A |
| (-4.0, -3.5] | 2 | N/A | N/A |
| (-3.5, -3.0] | N/A | N/A | N/A |
| (-3.0, -2.5] | 2 | 10 | N/A |
| (-2.5, -2.0] | 1 | 12 | N/A |
| (-2.0, -1.5] | 3 | 23 | N/A |
| (-1.5, -1.0] | 3 | 55 | 1 |
| (-1.0, -0.5] | N/A | 177 | 13 |
| (-0.5, 0.0] | N/A | 94 | 118 |
| (0.0, 0.5] | N/A | 61 | 237 |
| (0.5, 1.0] | N/A | 1 | 312 |
| (1.0, 1.5] | N/A | N/A | 145 |
| (1.5, 2.0] | N/A | N/A | 69 |
| (2.0, 2.5] | N/A | N/A | 17 |
| (2.5, 3.0] | N/A | N/A | 8 |
| (3.0, 3.5] | N/A | N/A | 5 |
| (3.5, 4.0] | N/A | N/A | 2 |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.8 Frequency Distribution of Theta by Pathway—ELA, Grade Eight

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 186 | N/A | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 3 | N/A | N/A |
| (-4.5, -4.0] | 3 | N/A | N/A |
| (-4.0, -3.5] | 11 | N/A | N/A |
| (-3.5, -3.0] | 3 | 2 | N/A |
| (-3.0, -2.5] | 6 | 7 | N/A |
| (-2.5, -2.0] | 5 | 6 | N/A |
| (-2.0, -1.5] | 3 | 23 | N/A |
| (-1.5, -1.0] | N/A | 31 | 2 |
| (-1.0, -0.5] | N/A | 128 | 4 |
| (-0.5, 0.0] | N/A | 285 | 43 |
| (0.0, 0.5] | N/A | 71 | 243 |
| (0.5, 1.0] | N/A | 21 | 290 |
| (1.0, 1.5] | N/A | N/A | 111 |
| (1.5, 2.0] | N/A | N/A | 28 |
| (2.0, 2.5] | N/A | N/A | 24 |
| (2.5, 3.0] | N/A | N/A | 5 |
| (3.0, 3.5] | N/A | N/A | 2 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.9 Frequency Distribution of Theta by Pathway—ELA, Grade Eleven

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 186 | 1 | N/A |
| [-6.0, -6.0] | N/A | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | 7 | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 14 | N/A | N/A |
| (-3.5, -3.0] | 2 | 5 | N/A |
| (-3.0, -2.5] | 5 | 4 | N/A |
| (-2.5, -2.0] | 2 | 12 | N/A |
| (-2.0, -1.5] | 6 | 22 | 1 |
| (-1.5, -1.0] | 3 | 40 | 3 |
| (-1.0, -0.5] | N/A | 105 | 6 |
| (-0.5, 0.0] | N/A | 149 | 44 |
| (0.0, 0.5] | N/A | 85 | 181 |
| (0.5, 1.0] | N/A | 18 | 241 |
| (1.0, 1.5] | N/A | N/A | 142 |
| (1.5, 2.0] | N/A | N/A | 55 |
| (2.0, 2.5] | N/A | N/A | 17 |
| (2.5, 3.0] | N/A | N/A | 4 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.10 Frequency Distribution of Theta by Pathway—Mathematics, Grade Three

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 317 | N/A | N/A |
| [-6.0, -6.0] | 2 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 15 | N/A | N/A |
| (-3.5, -3.0] | N/A | N/A | N/A |
| (-3.0, -2.5] | 28 | 6 | N/A |
| (-2.5, -2.0] | 3 | 12 | N/A |
| (-2.0, -1.5] | 3 | 17 | N/A |
| (-1.5, -1.0] | 2 | 51 | N/A |
| (-1.0, -0.5] | N/A | 172 | N/A |
| (-0.5, 0.0] | N/A | 263 | 8 |
| (0.0, 0.5] | N/A | 303 | 62 |
| (0.5, 1.0] | N/A | 107 | 96 |
| (1.0, 1.5] | N/A | 19 | 46 |
| (1.5, 2.0] | N/A | 2 | 12 |
| (2.0, 2.5] | N/A | N/A | 8 |
| (2.5, 3.0] | N/A | N/A | 5 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | 1 |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 1 |

Table 7.A.11 Frequency Distribution of Theta by Pathway—Mathematics, Grade Four

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 277 | N/A | N/A |
| [-6.0, -6.0] | N/A | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | 5 | N/A | N/A |
| (-4.0, -3.5] | 10 | N/A | N/A |
| (-3.5, -3.0] | 25 | N/A | N/A |
| (-3.0, -2.5] | 2 | 2 | N/A |
| (-2.5, -2.0] | 2 | 23 | N/A |
| (-2.0, -1.5] | 4 | 28 | N/A |
| (-1.5, -1.0] | 2 | 112 | N/A |
| (-1.0, -0.5] | N/A | 212 | 9 |
| (-0.5, 0.0] | N/A | 234 | 79 |
| (0.0, 0.5] | N/A | 139 | 233 |
| (0.5, 1.0] | N/A | 14 | 175 |
| (1.0, 1.5] | N/A | 1 | 54 |
| (1.5, 2.0] | N/A | N/A | 31 |
| (2.0, 2.5] | N/A | N/A | 2 |
| (2.5, 3.0] | N/A | N/A | 2 |
| (3.0, 3.5] | N/A | N/A | 4 |
| (3.5, 4.0] | N/A | N/A | 2 |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 2 |

Table 7.A.12 Frequency Distribution of Theta by Pathway—Mathematics, Grade Five

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 252 | N/A | N/A |
| [-6.0, -6.0] | 3 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 7 | N/A | N/A |
| (-3.5, -3.0] | 13 | N/A | N/A |
| (-3.0, -2.5] | 27 | N/A | N/A |
| (-2.5, -2.0] | 11 | 10 | N/A |
| (-2.0, -1.5] | 3 | 15 | N/A |
| (-1.5, -1.0] | 2 | 33 | N/A |
| (-1.0, -0.5] | N/A | 151 | 2 |
| (-0.5, 0.0] | N/A | 434 | 41 |
| (0.0, 0.5] | N/A | 177 | 150 |
| (0.5, 1.0] | N/A | 36 | 216 |
| (1.0, 1.5] | N/A | 3 | 60 |
| (1.5, 2.0] | N/A | N/A | 16 |
| (2.0, 2.5] | N/A | N/A | 6 |
| (2.5, 3.0] | N/A | N/A | 2 |
| (3.0, 3.5] | N/A | N/A | 2 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.13 Frequency Distribution of Theta by Pathway—Mathematics, Grade Six

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 270 | N/A | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 10 | N/A | N/A |
| (-3.5, -3.0] | N/A | N/A | N/A |
| (-3.0, -2.5] | 28 | N/A | N/A |
| (-2.5, -2.0] | 5 | 3 | N/A |
| (-2.0, -1.5] | 3 | 10 | N/A |
| (-1.5, -1.0] | 2 | 40 | N/A |
| (-1.0, -0.5] | 1 | 112 | 2 |
| (-0.5, 0.0] | N/A | 335 | 15 |
| (0.0, 0.5] | N/A | 347 | 94 |
| (0.5, 1.0] | N/A | 83 | 104 |
| (1.0, 1.5] | N/A | 5 | 105 |
| (1.5, 2.0] | N/A | N/A | 27 |
| (2.0, 2.5] | N/A | N/A | 17 |
| (2.5, 3.0] | N/A | N/A | 7 |
| (3.0, 3.5] | N/A | N/A | 1 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | 3 |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.14 Frequency Distribution of Theta by Pathway—Mathematics, Grade Seven

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 202 | N/A | N/A |
| [-6.0, -6.0] | 6 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 16 | N/A | N/A |
| (-3.5, -3.0] | 37 | N/A | N/A |
| (-3.0, -2.5] | N/A | 4 | N/A |
| (-2.5, -2.0] | 3 | 8 | N/A |
| (-2.0, -1.5] | 2 | 9 | N/A |
| (-1.5, -1.0] | 3 | 15 | N/A |
| (-1.0, -0.5] | 1 | 134 | 2 |
| (-0.5, 0.0] | N/A | 320 | 36 |
| (0.0, 0.5] | N/A | 149 | 165 |
| (0.5, 1.0] | N/A | 39 | 218 |
| (1.0, 1.5] | N/A | 1 | 104 |
| (1.5, 2.0] | N/A | N/A | 60 |
| (2.0, 2.5] | N/A | N/A | 16 |
| (2.5, 3.0] | N/A | N/A | 6 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | 5 |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | 1 |

Table 7.A.15 Frequency Distribution of Theta by Pathway—Mathematics, Grade Eight

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 211 | N/A | N/A |
| [-6.0, -6.0] | 1 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 7 | N/A | N/A |
| (-3.5, -3.0] | 15 | N/A | N/A |
| (-3.0, -2.5] | 13 | N/A | N/A |
| (-2.5, -2.0] | 3 | 1 | N/A |
| (-2.0, -1.5] | 4 | 10 | N/A |
| (-1.5, -1.0] | 1 | 17 | N/A |
| (-1.0, -0.5] | 3 | 133 | 9 |
| (-0.5, 0.0] | N/A | 272 | 37 |
| (0.0, 0.5] | N/A | 134 | 202 |
| (0.5, 1.0] | N/A | 6 | 229 |
| (1.0, 1.5] | N/A | N/A | 104 |
| (1.5, 2.0] | N/A | N/A | 75 |
| (2.0, 2.5] | N/A | N/A | 29 |
| (2.5, 3.0] | N/A | N/A | 9 |
| (3.0, 3.5] | N/A | N/A | 1 |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | 1 |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

Table 7.A.16 Frequency Distribution of Theta by Pathway—Mathematics, Grade Eleven

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Score | Early Exit | Easy Pathway | Hard Pathway |
| Incomplete | 223 | N/A | N/A |
| [-6.0, -6.0] | 2 | N/A | N/A |
| (-6.0, -5.5] | N/A | N/A | N/A |
| (-5.5, -5.0] | N/A | N/A | N/A |
| (-5.0, -4.5] | N/A | N/A | N/A |
| (-4.5, -4.0] | N/A | N/A | N/A |
| (-4.0, -3.5] | 8 | N/A | N/A |
| (-3.5, -3.0] | 1 | 1 | N/A |
| (-3.0, -2.5] | 3 | 6 | N/A |
| (-2.5, -2.0] | 2 | 5 | N/A |
| (-2.0, -1.5] | 2 | 16 | N/A |
| (-1.5, -1.0] | 4 | 56 | N/A |
| (-1.0, -0.5] | N/A | 155 | N/A |
| (-0.5, 0.0] | N/A | 223 | 15 |
| (0.0, 0.5] | N/A | 108 | 187 |
| (0.5, 1.0] | N/A | 13 | 162 |
| (1.0, 1.5] | N/A | 1 | 83 |
| (1.5, 2.0] | N/A | N/A | 45 |
| (2.0, 2.5] | N/A | N/A | 14 |
| (2.5, 3.0] | N/A | N/A | 1 |
| (3.0, 3.5] | N/A | N/A | N/A |
| (3.5, 4.0] | N/A | N/A | N/A |
| (4.0, 4.5] | N/A | N/A | N/A |
| (4.5, 5.0] | N/A | N/A | N/A |
| (5.0, 5.5] | N/A | N/A | N/A |
| (5.5, 6.0] | N/A | N/A | N/A |

### Appendix 7.B: Raw Score and Scale Score Distributions for Each Pathway on Each Test

**Notes:**

* An incomplete test was assigned either the LOSS or LOSS+1.
* When a student was logged on to the TDS but did not answer any item, LOSS was assigned as 300 for grade three, 400 for grade four, ... , 900 for grade eleven.
* When a student was logged on and answered fewer than four items, LOSS+1 was assigned, such as 301 for grade three, 401 for grade four, ... , 901 for grade eleven.
* For those incomplete test cases, raw scores were overwritten as zero.
* Percentages for some pathways may not sum up to exactly 100 because of rounding.
* Raw-score-to-scale-score distribution is shown only for values within the raw score range for the respective pathway.
* In table 7.B.1 through table 7.B.14, the pathway indicates the set of modules a given student received:

|  |  |  |  |
| --- | --- | --- | --- |
| Pathway | Combination of Modules | Raw Score Minimum | Raw Score Maximum |
| Early Exit | Stage 1 (as router) and exit the test | Zero | Stage 1 Maximum |
| Easy | Stage 1 (as router) and Stage 2 Easy Module | Router threshold score for Easy | (Router threshold score for Hard minus one) plus Stage 2 Easy Module Maximum |
| Hard | Stage 1 (as router) and Stage 2 Hard Module | Router threshold score for Hard | Stage 1 Maximum plus Stage 2 Hard Module Maximum |

Table 7.B.1 Raw-Score-to-Scale-Score Distribution—ELA, Grade Three

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 300 | 176 | 58% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 301 | 89 | 29% | N/A | 301 | 2 | 1% | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 303 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.836 | 303 | 5 | 2% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -4.089 | 303 | 18 | 6% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.629 | 303 | 3 | 1% | -3.629 | 303 | 4 | 1% | N/A | N/A | N/A | N/A |
| 4 | -3.286 | 303 | 6 | 2% | -3.286 | 303 | 5 | 2% | N/A | N/A | N/A | N/A |
| 5 | -3.007 | 303 | 1 | 0% | -3.007 | 303 | 7 | 2% | N/A | N/A | N/A | N/A |
| 6 | -2.769 | 306 | 1 | 0% | -2.769 | 306 | 8 | 3% | N/A | N/A | N/A | N/A |
| 7 | -2.559 | 310 | 1 | 0% | -2.559 | 310 | 8 | 3% | N/A | N/A | N/A | N/A |
| 8 | -2.369 | 312 | 0 | 0% | -2.369 | 312 | 7 | 2% | N/A | N/A | N/A | N/A |
| 9 | -2.194 | 315 | 1 | 0% | -2.194 | 315 | 5 | 2% | -1.755 | 322 | 1 | 0% |
| 10 | -2.032 | 318 | 0 | 0% | -2.032 | 318 | 7 | 2% | -1.580 | 324 | 5 | 1% |
| 11 | -1.879 | 320 | 1 | 0% | -1.879 | 320 | 15 | 5% | -1.416 | 327 | 1 | 0% |
| 12 | -1.734 | 322 | 0 | 0% | -1.734 | 322 | 11 | 4% | -1.261 | 329 | 2 | 0% |
| 13 | -1.596 | 324 | 0 | 0% | -1.596 | 324 | 10 | 3% | -1.113 | 331 | 8 | 1% |
| 14 | -1.461 | 326 | 0 | 0% | -1.461 | 326 | 12 | 4% | -0.970 | 333 | 7 | 1% |
| 15 | -1.331 | 328 | 0 | 0% | -1.331 | 328 | 17 | 6% | -0.832 | 336 | 12 | 1% |
| 16 | N/A | N/A | N/A | N/A | -1.203 | 330 | 25 | 8% | -0.697 | 338 | 19 | 2% |
| 17 | N/A | N/A | N/A | N/A | -1.077 | 332 | 20 | 7% | -0.565 | 340 | 37 | 4% |
| 18 | N/A | N/A | N/A | N/A | -0.952 | 334 | 24 | 8% | -0.435 | 341 | 44 | 4% |
| 19 | N/A | N/A | N/A | N/A | -0.827 | 336 | 28 | 9% | -0.305 | 343 | 56 | 6% |
| 20 | N/A | N/A | N/A | N/A | -0.701 | 337 | 26 | 9% | -0.176 | 345 | 60 | 6% |
| 21 | N/A | N/A | N/A | N/A | -0.575 | 339 | 17 | 6% | -0.046 | 347 | 48 | 5% |
| 22 | N/A | N/A | N/A | N/A | -0.446 | 341 | 20 | 7% | 0.086 | 349 | 66 | 7% |
| 23 | N/A | N/A | N/A | N/A | -0.314 | 343 | 9 | 3% | 0.220 | 351 | 75 | 8% |
| 24 | N/A | N/A | N/A | N/A | -0.179 | 345 | 4 | 1% | 0.358 | 353 | 71 | 7% |
| 25 | N/A | N/A | N/A | N/A | -0.040 | 347 | 4 | 1% | 0.500 | 355 | 54 | 6% |
| 26 | N/A | N/A | N/A | N/A | 0.106 | 350 | 2 | 1% | 0.648 | 358 | 55 | 6% |
| 27 | N/A | N/A | N/A | N/A | 0.259 | 352 | 2 | 1% | 0.805 | 360 | 48 | 5% |
| 28 | N/A | N/A | N/A | N/A | 0.422 | 354 | 0 | 0% | 0.972 | 363 | 65 | 7% |
| 29 | N/A | N/A | N/A | N/A | 0.599 | 357 | 0 | 0% | 1.154 | 365 | 45 | 5% |

Table 7.B.1 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.356 | 368 | 40 | 4% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.585 | 372 | 43 | 4% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.854 | 376 | 37 | 4% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.189 | 381 | 29 | 3% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.644 | 388 | 23 | 2% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.388 | 399 | 19 | 2% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 399 | 9 | 1% |

Table 7.B.2 Raw-Score-to-Scale-Score Distribution—ELA, Grade Four

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 400 | 179 | 57% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 401 | 86 | 27% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 403 | 0 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.651 | 403 | 4 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.902 | 403 | 18 | 6% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.440 | 403 | 4 | 1% | -3.440 | 403 | 3 | 1% | N/A | N/A | N/A | N/A |
| 4 | -3.096 | 403 | 7 | 2% | -3.096 | 403 | 6 | 1% | N/A | N/A | N/A | N/A |
| 5 | -2.817 | 403 | 1 | 0% | -2.817 | 403 | 6 | 1% | N/A | N/A | N/A | N/A |
| 6 | -2.578 | 406 | 2 | 1% | -2.578 | 406 | 8 | 1% | N/A | N/A | N/A | N/A |
| 7 | -2.368 | 409 | 1 | 0% | -2.368 | 409 | 8 | 1% | N/A | N/A | N/A | N/A |
| 8 | -2.179 | 412 | 2 | 1% | -2.179 | 412 | 6 | 1% | N/A | N/A | N/A | N/A |
| 9 | -2.006 | 415 | 1 | 0% | -2.006 | 415 | 14 | 2% | N/A | N/A | N/A | N/A |
| 10 | -1.846 | 417 | 2 | 1% | -1.846 | 417 | 9 | 2% | -1.337 | 425 | 1 | 0% |
| 11 | -1.696 | 420 | 5 | 2% | -1.696 | 420 | 6 | 1% | -1.183 | 427 | 3 | 0% |
| 12 | -1.555 | 422 | 1 | 0% | -1.555 | 422 | 16 | 3% | -1.037 | 429 | 1 | 0% |
| 13 | -1.420 | 424 | 0 | 0% | -1.420 | 424 | 18 | 3% | -0.898 | 432 | 2 | 0% |
| 14 | -1.292 | 426 | 1 | 0% | -1.292 | 426 | 20 | 3% | -0.764 | 434 | 3 | 0% |
| 15 | -1.168 | 427 | 1 | 0% | -1.168 | 427 | 27 | 5% | -0.634 | 435 | 4 | 1% |
| 16 | N/A | N/A | N/A | N/A | -1.048 | 429 | 31 | 5% | -0.507 | 437 | 10 | 1% |
| 17 | N/A | N/A | N/A | N/A | -0.930 | 431 | 42 | 7% | -0.382 | 439 | 12 | 2% |
| 18 | N/A | N/A | N/A | N/A | -0.815 | 433 | 46 | 8% | -0.257 | 441 | 20 | 3% |
| 19 | N/A | N/A | N/A | N/A | -0.701 | 434 | 48 | 8% | -0.133 | 443 | 35 | 4% |
| 20 | N/A | N/A | N/A | N/A | -0.587 | 436 | 68 | 12% | -0.009 | 445 | 51 | 6% |
| 21 | N/A | N/A | N/A | N/A | -0.473 | 438 | 54 | 9% | 0.117 | 447 | 52 | 7% |
| 22 | N/A | N/A | N/A | N/A | -0.358 | 440 | 45 | 8% | 0.246 | 449 | 47 | 6% |
| 23 | N/A | N/A | N/A | N/A | -0.241 | 441 | 38 | 6% | 0.377 | 451 | 78 | 10% |
| 24 | N/A | N/A | N/A | N/A | -0.120 | 443 | 30 | 5% | 0.512 | 453 | 72 | 9% |
| 25 | N/A | N/A | N/A | N/A | 0.005 | 445 | 20 | 3% | 0.652 | 455 | 69 | 9% |
| 26 | N/A | N/A | N/A | N/A | 0.135 | 447 | 11 | 2% | 0.799 | 457 | 59 | 7% |
| 27 | N/A | N/A | N/A | N/A | 0.273 | 449 | 5 | 1% | 0.955 | 459 | 57 | 7% |
| 28 | N/A | N/A | N/A | N/A | 0.420 | 451 | 4 | 1% | 1.122 | 462 | 52 | 7% |
| 29 | N/A | N/A | N/A | N/A | 0.579 | 454 | 1 | 0% | 1.303 | 465 | 52 | 7% |

Table 7.B.2 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 0.753 | 456 | 0 | 0% | 1.504 | 468 | 46 | 6% |
| 31 | N/A | N/A | N/A | N/A | 0.948 | 459 | 0 | 0% | 1.733 | 471 | 22 | 3% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.003 | 475 | 25 | 3% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.337 | 480 | 12 | 2% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.789 | 487 | 7 | 1% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.529 | 498 | 3 | 0% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 499 | 1 | 0% |

Table 7.B.3 Raw-Score-to-Scale-Score Distribution—ELA, Grade Five

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 500 | 147 | 53% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 501 | 57 | 21% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 503 | 0 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -5.252 | 503 | 9 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -4.492 | 503 | 14 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -4.019 | 503 | 13 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -3.662 | 503 | 22 | 8% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 5 | -3.370 | 503 | 4 | 1% | -3.370 | 503 | 3 | 1% | N/A | N/A | N/A | N/A |
| 6 | -3.117 | 503 | 2 | 1% | -3.117 | 503 | 2 | 0% | N/A | N/A | N/A | N/A |
| 7 | -2.892 | 503 | 1 | 0% | -2.892 | 503 | 5 | 1% | N/A | N/A | N/A | N/A |
| 8 | -2.688 | 505 | 2 | 1% | -2.688 | 505 | 2 | 0% | N/A | N/A | N/A | N/A |
| 9 | -2.498 | 508 | 0 | 0% | -2.498 | 508 | 5 | 1% | N/A | N/A | N/A | N/A |
| 10 | -2.321 | 510 | 1 | 0% | -2.321 | 510 | 6 | 1% | N/A | N/A | N/A | N/A |
| 11 | -2.154 | 513 | 1 | 0% | -2.154 | 513 | 6 | 1% | -1.480 | 523 | 5 | 1% |
| 12 | -1.996 | 515 | 0 | 0% | -1.996 | 515 | 4 | 1% | -1.312 | 525 | 1 | 0% |
| 13 | -1.844 | 517 | 1 | 0% | -1.844 | 517 | 5 | 1% | -1.153 | 528 | 2 | 0% |
| 14 | -1.698 | 520 | 0 | 0% | -1.698 | 520 | 8 | 2% | -1.002 | 530 | 2 | 0% |
| 15 | -1.557 | 522 | 1 | 0% | -1.557 | 522 | 10 | 2% | -0.857 | 532 | 4 | 0% |
| 16 | -1.421 | 524 | 1 | 0% | -1.421 | 524 | 18 | 4% | -0.718 | 534 | 10 | 1% |
| 17 | N/A | N/A | N/A | N/A | -1.288 | 526 | 30 | 7% | -0.582 | 536 | 14 | 1% |
| 18 | N/A | N/A | N/A | N/A | -1.158 | 528 | 33 | 8% | -0.450 | 538 | 19 | 2% |
| 19 | N/A | N/A | N/A | N/A | -1.030 | 530 | 34 | 8% | -0.319 | 540 | 34 | 3% |
| 20 | N/A | N/A | N/A | N/A | -0.903 | 531 | 34 | 8% | -0.189 | 542 | 41 | 4% |
| 21 | N/A | N/A | N/A | N/A | -0.777 | 533 | 36 | 8% | -0.059 | 544 | 57 | 6% |
| 22 | N/A | N/A | N/A | N/A | -0.651 | 535 | 49 | 11% | 0.072 | 546 | 51 | 5% |
| 23 | N/A | N/A | N/A | N/A | -0.523 | 537 | 39 | 9% | 0.205 | 548 | 71 | 7% |
| 24 | N/A | N/A | N/A | N/A | -0.394 | 539 | 29 | 7% | 0.342 | 550 | 86 | 9% |
| 25 | N/A | N/A | N/A | N/A | -0.262 | 541 | 27 | 6% | 0.484 | 552 | 69 | 7% |
| 26 | N/A | N/A | N/A | N/A | -0.126 | 543 | 18 | 4% | 0.632 | 554 | 69 | 7% |
| 27 | N/A | N/A | N/A | N/A | 0.016 | 545 | 13 | 3% | 0.790 | 557 | 64 | 7% |
| 28 | N/A | N/A | N/A | N/A | 0.165 | 547 | 15 | 3% | 0.960 | 559 | 57 | 6% |
| 29 | N/A | N/A | N/A | N/A | 0.323 | 550 | 5 | 1% | 1.145 | 562 | 64 | 7% |

Table 7.B.3 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 0.492 | 552 | 4 | 1% | 1.351 | 565 | 60 | 6% |
| 31 | N/A | N/A | N/A | N/A | 0.677 | 555 | 0 | 0% | 1.587 | 569 | 70 | 7% |
| 32 | N/A | N/A | N/A | N/A | 0.881 | 558 | 0 | 0% | 1.864 | 573 | 54 | 6% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.208 | 578 | 28 | 3% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.671 | 585 | 28 | 3% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.424 | 596 | 14 | 1% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 599 | 4 | 0% |

Table 7.B.4 Raw-Score-to-Scale-Score Distribution—ELA, Grade Six

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 600 | 129 | 50% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 601 | 76 | 29% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 603 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.531 | 603 | 6 | 2% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.790 | 603 | 9 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.340 | 603 | 7 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -3.011 | 607 | 14 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 5 | -2.748 | 611 | 1 | 0% | -2.748 | 611 | 3 | 1% | N/A | N/A | N/A | N/A |
| 6 | -2.528 | 613 | 2 | 1% | -2.528 | 613 | 4 | 2% | N/A | N/A | N/A | N/A |
| 7 | -2.338 | 616 | 2 | 1% | -2.338 | 616 | 4 | 2% | N/A | N/A | N/A | N/A |
| 8 | -2.169 | 618 | 3 | 1% | -2.169 | 618 | 6 | 2% | N/A | N/A | N/A | N/A |
| 9 | -2.016 | 620 | 4 | 2% | -2.016 | 620 | 5 | 2% | N/A | N/A | N/A | N/A |
| 10 | -1.876 | 622 | 0 | 0% | -1.876 | 622 | 1 | 0% | -1.498 | 626 | 4 | 0% |
| 11 | -1.746 | 623 | 2 | 1% | -1.746 | 623 | 10 | 4% | -1.358 | 628 | 2 | 0% |
| 12 | -1.623 | 625 | 3 | 1% | -1.623 | 625 | 7 | 3% | -1.225 | 630 | 4 | 0% |
| 13 | -1.505 | 626 | 0 | 0% | -1.505 | 626 | 10 | 4% | -1.098 | 631 | 1 | 0% |
| 14 | -1.393 | 628 | 1 | 0% | -1.393 | 628 | 11 | 5% | -0.975 | 633 | 5 | 0% |
| 15 | -1.283 | 629 | 0 | 0% | -1.283 | 629 | 11 | 5% | -0.854 | 634 | 6 | 1% |
| 16 | -1.176 | 630 | 0 | 0% | -1.176 | 630 | 12 | 5% | -0.736 | 636 | 12 | 1% |
| 17 | N/A | N/A | N/A | N/A | -1.071 | 632 | 24 | 10% | -0.619 | 637 | 16 | 1% |
| 18 | N/A | N/A | N/A | N/A | -0.966 | 633 | 17 | 7% | -0.503 | 639 | 28 | 2% |
| 19 | N/A | N/A | N/A | N/A | -0.860 | 634 | 16 | 7% | -0.386 | 640 | 49 | 4% |
| 20 | N/A | N/A | N/A | N/A | -0.754 | 636 | 18 | 7% | -0.269 | 642 | 57 | 5% |
| 21 | N/A | N/A | N/A | N/A | -0.646 | 637 | 21 | 9% | -0.150 | 643 | 53 | 5% |
| 22 | N/A | N/A | N/A | N/A | -0.535 | 638 | 26 | 11% | -0.029 | 645 | 74 | 6% |
| 23 | N/A | N/A | N/A | N/A | -0.421 | 640 | 14 | 6% | 0.095 | 646 | 81 | 7% |
| 24 | N/A | N/A | N/A | N/A | -0.303 | 641 | 10 | 4% | 0.222 | 648 | 59 | 5% |
| 25 | N/A | N/A | N/A | N/A | -0.178 | 643 | 5 | 2% | 0.354 | 649 | 105 | 9% |
| 26 | N/A | N/A | N/A | N/A | -0.047 | 644 | 4 | 2% | 0.490 | 651 | 74 | 6% |
| 27 | N/A | N/A | N/A | N/A | 0.092 | 646 | 3 | 1% | 0.632 | 653 | 83 | 7% |
| 28 | N/A | N/A | N/A | N/A | 0.242 | 648 | 2 | 1% | 0.781 | 655 | 64 | 6% |
| 29 | N/A | N/A | N/A | N/A | 0.405 | 650 | 0 | 0% | 0.939 | 657 | 61 | 5% |

Table 7.B.4 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 0.584 | 652 | 0 | 0% | 1.108 | 659 | 65 | 6% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.291 | 661 | 56 | 5% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.494 | 664 | 53 | 5% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.724 | 667 | 40 | 3% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.994 | 670 | 44 | 4% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.328 | 674 | 30 | 3% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.781 | 680 | 12 | 1% |
| 37 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.523 | 689 | 10 | 1% |
| 38 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 699 | 1 | 0% |

Table 7.B.5 Raw-Score-to-Scale-Score Distribution—ELA, Grade Seven

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 700 | 138 | 62% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 701 | 57 | 26% | N/A | 701 | 1 | 0% | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 703 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.778 | 703 | 3 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -4.003 | 703 | 11 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.517 | 703 | 2 | 1% | -3.517 | 703 | 0 | 0% | N/A | N/A | N/A | N/A |
| 4 | -3.149 | 703 | 0 | 0% | -3.149 | 703 | 0 | 0% | N/A | N/A | N/A | N/A |
| 5 | -2.847 | 703 | 0 | 0% | -2.847 | 703 | 3 | 1% | N/A | N/A | N/A | N/A |
| 6 | -2.586 | 706 | 2 | 1% | -2.586 | 706 | 7 | 2% | N/A | N/A | N/A | N/A |
| 7 | -2.354 | 710 | 0 | 0% | -2.354 | 710 | 6 | 1% | N/A | N/A | N/A | N/A |
| 8 | -2.143 | 713 | 1 | 0% | -2.143 | 713 | 6 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.948 | 716 | 1 | 0% | -1.948 | 716 | 7 | 2% | -1.341 | 725 | 0 | 0% |
| 10 | -1.766 | 719 | 1 | 0% | -1.766 | 719 | 8 | 2% | -1.144 | 728 | 1 | 0% |
| 11 | -1.594 | 721 | 1 | 0% | -1.594 | 721 | 8 | 2% | -0.961 | 731 | 3 | 0% |
| 12 | -1.431 | 724 | 3 | 1% | -1.431 | 724 | 15 | 3% | -0.788 | 733 | 6 | 1% |
| 13 | -1.274 | 726 | 0 | 0% | -1.274 | 726 | 16 | 4% | -0.623 | 736 | 4 | 0% |
| 14 | -1.124 | 728 | 0 | 0% | -1.124 | 728 | 24 | 6% | -0.466 | 738 | 11 | 1% |
| 15 | N/A | N/A | N/A | N/A | -0.978 | 730 | 41 | 9% | -0.314 | 740 | 24 | 3% |
| 16 | N/A | N/A | N/A | N/A | -0.835 | 732 | 36 | 8% | -0.167 | 742 | 26 | 3% |
| 17 | N/A | N/A | N/A | N/A | -0.695 | 735 | 53 | 12% | -0.023 | 745 | 57 | 6% |
| 18 | N/A | N/A | N/A | N/A | -0.556 | 737 | 47 | 11% | 0.118 | 747 | 79 | 9% |
| 19 | N/A | N/A | N/A | N/A | -0.418 | 739 | 34 | 8% | 0.258 | 749 | 66 | 7% |
| 20 | N/A | N/A | N/A | N/A | -0.279 | 741 | 33 | 8% | 0.398 | 751 | 92 | 10% |
| 21 | N/A | N/A | N/A | N/A | -0.138 | 743 | 27 | 6% | 0.538 | 753 | 99 | 11% |
| 22 | N/A | N/A | N/A | N/A | 0.007 | 745 | 25 | 6% | 0.681 | 755 | 81 | 9% |
| 23 | N/A | N/A | N/A | N/A | 0.156 | 747 | 16 | 4% | 0.827 | 757 | 64 | 7% |
| 24 | N/A | N/A | N/A | N/A | 0.312 | 750 | 10 | 2% | 0.979 | 760 | 68 | 7% |
| 25 | N/A | N/A | N/A | N/A | 0.476 | 752 | 10 | 2% | 1.139 | 762 | 56 | 6% |
| 26 | N/A | N/A | N/A | N/A | 0.651 | 755 | 1 | 0% | 1.310 | 765 | 44 | 5% |
| 27 | N/A | N/A | N/A | N/A | 0.842 | 758 | 0 | 0% | 1.495 | 767 | 45 | 5% |
| 28 | N/A | N/A | N/A | N/A | 1.052 | 761 | 0 | 0% | 1.701 | 771 | 36 | 4% |
| 29 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.935 | 774 | 33 | 4% |

Table 7.B.5 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.211 | 778 | 17 | 2% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.554 | 783 | 8 | 1% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.019 | 790 | 5 | 1% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.778 | 799 | 2 | 0% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 799 | 0 | 0% |

Table 7.B.6 Raw-Score-to-Scale-Score Distribution—ELA, Grade Eight

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 800 | 135 | 61% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 801 | 51 | 23% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 803 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.863 | 803 | 3 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -4.113 | 803 | 3 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.648 | 803 | 11 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -3.300 | 806 | 2 | 1% | -3.300 | 806 | 0 | 0% | N/A | N/A | N/A | N/A |
| 5 | -3.015 | 810 | 1 | 0% | -3.015 | 810 | 2 | 0% | N/A | N/A | N/A | N/A |
| 6 | -2.769 | 813 | 5 | 2% | -2.769 | 813 | 1 | 0% | N/A | N/A | N/A | N/A |
| 7 | -2.551 | 816 | 1 | 0% | -2.551 | 816 | 6 | 1% | N/A | N/A | N/A | N/A |
| 8 | -2.352 | 818 | 2 | 1% | -2.352 | 818 | 3 | 1% | N/A | N/A | N/A | N/A |
| 9 | -2.168 | 820 | 3 | 1% | -2.168 | 820 | 3 | 1% | N/A | N/A | N/A | N/A |
| 10 | -1.996 | 823 | 2 | 1% | -1.996 | 823 | 5 | 1% | N/A | N/A | N/A | N/A |
| 11 | -1.833 | 825 | 0 | 0% | -1.833 | 825 | 3 | 1% | -1.269 | 832 | 1 | 0% |
| 12 | -1.678 | 827 | 0 | 0% | -1.678 | 827 | 6 | 1% | -1.101 | 834 | 1 | 0% |
| 13 | -1.529 | 828 | 1 | 0% | -1.529 | 828 | 9 | 2% | -0.942 | 836 | 0 | 0% |
| 14 | -1.386 | 830 | 0 | 0% | -1.386 | 830 | 5 | 1% | -0.792 | 838 | 1 | 0% |
| 15 | -1.248 | 832 | 0 | 0% | -1.248 | 832 | 13 | 2% | -0.648 | 839 | 1 | 0% |
| 16 | -1.115 | 834 | 0 | 0% | -1.115 | 834 | 13 | 2% | -0.510 | 841 | 2 | 0% |
| 17 | -0.985 | 835 | 0 | 0% | -0.985 | 835 | 32 | 6% | -0.377 | 843 | 4 | 1% |
| 18 | N/A | N/A | N/A | N/A | -0.858 | 837 | 20 | 3% | -0.246 | 844 | 14 | 2% |
| 19 | N/A | N/A | N/A | N/A | -0.734 | 838 | 36 | 6% | -0.118 | 846 | 25 | 3% |
| 20 | N/A | N/A | N/A | N/A | -0.611 | 840 | 40 | 7% | 0.009 | 848 | 47 | 6% |
| 21 | N/A | N/A | N/A | N/A | -0.491 | 841 | 71 | 12% | 0.136 | 849 | 57 | 8% |
| 22 | N/A | N/A | N/A | N/A | -0.371 | 843 | 53 | 9% | 0.263 | 851 | 65 | 9% |
| 23 | N/A | N/A | N/A | N/A | -0.251 | 844 | 66 | 12% | 0.393 | 852 | 74 | 10% |
| 24 | N/A | N/A | N/A | N/A | -0.131 | 846 | 53 | 9% | 0.525 | 854 | 83 | 11% |
| 25 | N/A | N/A | N/A | N/A | -0.010 | 847 | 42 | 7% | 0.660 | 856 | 82 | 11% |
| 26 | N/A | N/A | N/A | N/A | 0.114 | 849 | 37 | 6% | 0.801 | 858 | 69 | 9% |
| 27 | N/A | N/A | N/A | N/A | 0.241 | 851 | 20 | 3% | 0.947 | 859 | 56 | 7% |
| 28 | N/A | N/A | N/A | N/A | 0.371 | 852 | 14 | 2% | 1.102 | 861 | 44 | 6% |
| 29 | N/A | N/A | N/A | N/A | 0.508 | 854 | 8 | 1% | 1.265 | 863 | 41 | 5% |

Table 7.B.6 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 0.652 | 856 | 8 | 1% | 1.440 | 866 | 26 | 3% |
| 31 | N/A | N/A | N/A | N/A | 0.804 | 858 | 3 | 1% | 1.631 | 868 | 20 | 3% |
| 32 | N/A | N/A | N/A | N/A | 0.969 | 860 | 2 | 0% | 1.841 | 871 | 8 | 1% |
| 33 | N/A | N/A | N/A | N/A | 1.149 | 862 | 0 | 0% | 2.079 | 873 | 16 | 2% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.356 | 877 | 8 | 1% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.697 | 881 | 5 | 1% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.155 | 887 | 2 | 0% |
| 37 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.899 | 896 | 0 | 0% |
| 38 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 899 | 0 | 0% |

Table 7.B.7 Raw-Score-to-Scale-Score Distribution—ELA, Grade Eleven

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 900 | 139 | 62% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 901 | 47 | 21% | N/A | 901 | 1 | 0% | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 903 | 0 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.510 | 903 | 7 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.747 | 903 | 14 | 6% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.272 | 907 | 2 | 1% | -3.272 | 907 | 5 | 1% | N/A | N/A | N/A | N/A |
| 4 | -2.914 | 911 | 2 | 1% | -2.914 | 911 | 1 | 0% | N/A | N/A | N/A | N/A |
| 5 | -2.621 | 915 | 3 | 1% | -2.621 | 915 | 3 | 1% | N/A | N/A | N/A | N/A |
| 6 | -2.368 | 918 | 2 | 1% | -2.368 | 918 | 6 | 1% | N/A | N/A | N/A | N/A |
| 7 | -2.144 | 921 | 0 | 0% | -2.144 | 921 | 6 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.941 | 923 | 2 | 1% | -1.941 | 923 | 5 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.754 | 926 | 4 | 2% | -1.754 | 926 | 4 | 1% | -1.536 | 928 | 1 | 0% |
| 10 | -1.580 | 928 | 0 | 0% | -1.580 | 928 | 13 | 3% | -1.353 | 931 | 2 | 0% |
| 11 | -1.417 | 930 | 1 | 0% | -1.417 | 930 | 7 | 2% | -1.179 | 933 | 1 | 0% |
| 12 | -1.262 | 932 | 1 | 0% | -1.262 | 932 | 16 | 4% | -1.014 | 935 | 0 | 0% |
| 13 | -1.115 | 934 | 1 | 0% | -1.115 | 934 | 17 | 4% | -0.855 | 937 | 1 | 0% |
| 14 | -0.973 | 935 | 0 | 0% | -0.973 | 935 | 20 | 5% | -0.702 | 939 | 2 | 0% |
| 15 | N/A | N/A | N/A | N/A | -0.836 | 937 | 30 | 7% | -0.554 | 941 | 3 | 0% |
| 16 | N/A | N/A | N/A | N/A | -0.703 | 939 | 26 | 6% | -0.409 | 942 | 6 | 1% |
| 17 | N/A | N/A | N/A | N/A | -0.573 | 940 | 29 | 7% | -0.269 | 944 | 10 | 1% |
| 18 | N/A | N/A | N/A | N/A | -0.444 | 942 | 49 | 11% | -0.132 | 946 | 28 | 4% |
| 19 | N/A | N/A | N/A | N/A | -0.317 | 944 | 42 | 10% | 0.003 | 948 | 26 | 4% |
| 20 | N/A | N/A | N/A | N/A | -0.189 | 945 | 27 | 6% | 0.137 | 949 | 35 | 5% |
| 21 | N/A | N/A | N/A | N/A | -0.060 | 947 | 31 | 7% | 0.269 | 951 | 48 | 7% |
| 22 | N/A | N/A | N/A | N/A | 0.071 | 948 | 27 | 6% | 0.402 | 953 | 72 | 10% |
| 23 | N/A | N/A | N/A | N/A | 0.205 | 950 | 20 | 5% | 0.535 | 954 | 69 | 10% |
| 24 | N/A | N/A | N/A | N/A | 0.344 | 952 | 22 | 5% | 0.671 | 956 | 57 | 8% |
| 25 | N/A | N/A | N/A | N/A | 0.489 | 954 | 16 | 4% | 0.812 | 958 | 64 | 9% |
| 26 | N/A | N/A | N/A | N/A | 0.641 | 956 | 9 | 2% | 0.957 | 959 | 51 | 7% |
| 27 | N/A | N/A | N/A | N/A | 0.803 | 958 | 6 | 1% | 1.111 | 961 | 55 | 8% |
| 28 | N/A | N/A | N/A | N/A | 0.978 | 960 | 3 | 1% | 1.274 | 963 | 48 | 7% |
| 29 | N/A | N/A | N/A | N/A | 1.168 | 962 | 0 | 0% | 1.450 | 966 | 39 | 6% |

Table 7.B.7 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.379 | 965 | 0 | 0% | 1.643 | 968 | 31 | 4% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.857 | 971 | 24 | 3% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.101 | 974 | 11 | 2% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.387 | 977 | 6 | 1% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.740 | 982 | 4 | 1% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.211 | 988 | 0 | 0% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.971 | 997 | 0 | 0% |
| 37 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 999 | 0 | 0% |

Table 7.B.8 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Three

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 300 | 240 | 65% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 301 | 77 | 21% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 303 | 2 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.695 | 303 | 15 | 4% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -2.957 | 303 | 26 | 7% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -2.506 | 303 | 2 | 1% | -2.506 | 303 | 6 | 1% | N/A | N/A | N/A | N/A |
| 4 | -2.172 | 303 | 3 | 1% | -2.172 | 303 | 12 | 1% | N/A | N/A | N/A | N/A |
| 5 | -1.902 | 306 | 1 | 0% | -1.902 | 306 | 6 | 1% | N/A | N/A | N/A | N/A |
| 6 | -1.670 | 310 | 2 | 1% | -1.670 | 310 | 11 | 1% | N/A | N/A | N/A | N/A |
| 7 | -1.466 | 314 | 0 | 0% | -1.466 | 314 | 9 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.282 | 317 | 1 | 0% | -1.282 | 317 | 15 | 2% | N/A | N/A | N/A | N/A |
| 9 | -1.111 | 320 | 1 | 0% | -1.111 | 320 | 27 | 3% | N/A | N/A | N/A | N/A |
| 10 | -0.951 | 323 | 0 | 0% | -0.951 | 323 | 13 | 1% | -0.616 | 330 | 0 | 0% |
| 11 | -0.800 | 326 | 0 | 0% | -0.800 | 326 | 36 | 4% | -0.456 | 333 | 1 | 0% |
| 12 | -0.655 | 329 | 0 | 0% | -0.655 | 329 | 50 | 5% | -0.303 | 336 | 0 | 0% |
| 13 | -0.516 | 332 | 0 | 0% | -0.516 | 332 | 73 | 8% | -0.155 | 338 | 2 | 1% |
| 14 | N/A | N/A | N/A | N/A | -0.379 | 334 | 81 | 9% | -0.011 | 341 | 5 | 2% |
| 15 | N/A | N/A | N/A | N/A | -0.246 | 337 | 85 | 9% | 0.130 | 344 | 16 | 7% |
| 16 | N/A | N/A | N/A | N/A | -0.114 | 339 | 97 | 10% | 0.269 | 346 | 21 | 9% |
| 17 | N/A | N/A | N/A | N/A | 0.016 | 342 | 96 | 10% | 0.407 | 349 | 25 | 10% |
| 18 | N/A | N/A | N/A | N/A | 0.146 | 344 | 85 | 9% | 0.545 | 352 | 22 | 9% |
| 19 | N/A | N/A | N/A | N/A | 0.277 | 346 | 69 | 7% | 0.684 | 354 | 31 | 13% |
| 20 | N/A | N/A | N/A | N/A | 0.409 | 349 | 53 | 6% | 0.825 | 357 | 23 | 10% |
| 21 | N/A | N/A | N/A | N/A | 0.543 | 351 | 47 | 5% | 0.969 | 359 | 20 | 8% |
| 22 | N/A | N/A | N/A | N/A | 0.680 | 354 | 31 | 3% | 1.117 | 362 | 14 | 6% |
| 23 | N/A | N/A | N/A | N/A | 0.822 | 357 | 19 | 2% | 1.272 | 365 | 14 | 6% |
| 24 | N/A | N/A | N/A | N/A | 0.969 | 359 | 10 | 1% | 1.435 | 368 | 18 | 8% |
| 25 | N/A | N/A | N/A | N/A | 1.125 | 362 | 11 | 1% | 1.609 | 371 | 4 | 2% |
| 26 | N/A | N/A | N/A | N/A | 1.291 | 365 | 1 | 0% | 1.798 | 375 | 8 | 3% |
| 27 | N/A | N/A | N/A | N/A | 1.471 | 369 | 7 | 1% | 2.008 | 379 | 4 | 2% |
| 28 | N/A | N/A | N/A | N/A | 1.670 | 373 | 0 | 0% | 2.246 | 383 | 4 | 2% |
| 29 | N/A | N/A | N/A | N/A | 1.897 | 377 | 2 | 0% | 2.526 | 389 | 2 | 1% |

Table 7.B.8 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 2.164 | 382 | 0 | 0% | 2.874 | 395 | 3 | 1% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.343 | 399 | 0 | 0% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.107 | 399 | 1 | 0% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 399 | 1 | 0% |

Table 7.B.9 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Four

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 400 | 215 | 66% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 401 | 62 | 19% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 403 | 0 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -4.463 | 403 | 5 | 2% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.674 | 403 | 10 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -3.176 | 403 | 25 | 8% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -2.801 | 403 | 2 | 1% | -2.801 | 403 | 2 | 0% | N/A | N/A | N/A | N/A |
| 5 | -2.494 | 403 | 0 | 0% | -2.494 | 403 | 5 | 1% | N/A | N/A | N/A | N/A |
| 6 | -2.234 | 403 | 2 | 1% | -2.234 | 403 | 10 | 1% | N/A | N/A | N/A | N/A |
| 7 | -2.006 | 404 | 0 | 0% | -2.006 | 404 | 8 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.804 | 407 | 3 | 1% | -1.804 | 407 | 9 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.622 | 411 | 1 | 0% | -1.622 | 411 | 19 | 2% | N/A | N/A | N/A | N/A |
| 10 | -1.456 | 414 | 2 | 1% | -1.456 | 414 | 25 | 3% | N/A | N/A | N/A | N/A |
| 11 | -1.302 | 417 | 0 | 0% | -1.302 | 417 | 19 | 2% | -0.708 | 428 | 3 | 1% |
| 12 | -1.160 | 420 | 0 | 0% | -1.160 | 420 | 30 | 4% | -0.563 | 431 | 6 | 1% |
| 13 | -1.025 | 422 | 0 | 0% | -1.025 | 422 | 38 | 5% | -0.427 | 433 | 8 | 1% |
| 14 | -0.897 | 424 | 0 | 0% | -0.897 | 424 | 41 | 5% | -0.297 | 436 | 12 | 2% |
| 15 | -0.775 | 427 | 0 | 0% | -0.775 | 427 | 42 | 5% | -0.171 | 438 | 27 | 5% |
| 16 | N/A | N/A | N/A | N/A | -0.658 | 429 | 61 | 8% | -0.048 | 440 | 32 | 5% |
| 17 | N/A | N/A | N/A | N/A | -0.543 | 431 | 68 | 9% | 0.072 | 443 | 50 | 8% |
| 18 | N/A | N/A | N/A | N/A | -0.431 | 433 | 66 | 9% | 0.191 | 445 | 58 | 10% |
| 19 | N/A | N/A | N/A | N/A | -0.320 | 435 | 54 | 7% | 0.310 | 447 | 61 | 10% |
| 20 | N/A | N/A | N/A | N/A | -0.210 | 437 | 59 | 8% | 0.429 | 449 | 64 | 11% |
| 21 | N/A | N/A | N/A | N/A | -0.100 | 439 | 55 | 7% | 0.550 | 452 | 59 | 10% |
| 22 | N/A | N/A | N/A | N/A | 0.011 | 442 | 47 | 6% | 0.674 | 454 | 51 | 9% |
| 23 | N/A | N/A | N/A | N/A | 0.123 | 444 | 29 | 4% | 0.801 | 456 | 36 | 6% |
| 24 | N/A | N/A | N/A | N/A | 0.239 | 446 | 29 | 4% | 0.934 | 459 | 29 | 5% |
| 25 | N/A | N/A | N/A | N/A | 0.358 | 448 | 21 | 3% | 1.075 | 461 | 26 | 4% |
| 26 | N/A | N/A | N/A | N/A | 0.482 | 450 | 13 | 2% | 1.225 | 464 | 19 | 3% |
| 27 | N/A | N/A | N/A | N/A | 0.613 | 453 | 6 | 1% | 1.387 | 467 | 9 | 2% |
| 28 | N/A | N/A | N/A | N/A | 0.752 | 455 | 8 | 1% | 1.566 | 471 | 11 | 2% |
| 29 | N/A | N/A | N/A | N/A | 0.903 | 458 | 0 | 0% | 1.766 | 474 | 10 | 2% |

Table 7.B.9 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.068 | 461 | 0 | 0% | 1.996 | 479 | 10 | 2% |
| 31 | N/A | N/A | N/A | N/A | 1.253 | 465 | 1 | 0% | 2.270 | 484 | 2 | 0% |
| 32 | N/A | N/A | N/A | N/A | 1.466 | 469 | 0 | 0% | 2.611 | 490 | 2 | 0% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.074 | 499 | 4 | 1% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.830 | 499 | 2 | 0% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 499 | 2 | 0% |

Table 7.B.10 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Five

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 500 | 191 | 60% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 501 | 61 | 19% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 503 | 3 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.960 | 503 | 7 | 2% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.228 | 503 | 13 | 4% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -2.782 | 503 | 27 | 8% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -2.454 | 503 | 10 | 3% | -2.454 | 503 | 5 | 1% | N/A | N/A | N/A | N/A |
| 5 | -2.190 | 503 | 1 | 0% | -2.190 | 503 | 5 | 1% | N/A | N/A | N/A | N/A |
| 6 | -1.966 | 504 | 1 | 0% | -1.966 | 504 | 3 | 0% | N/A | N/A | N/A | N/A |
| 7 | -1.769 | 508 | 0 | 0% | -1.769 | 508 | 4 | 0% | N/A | N/A | N/A | N/A |
| 8 | -1.592 | 511 | 2 | 1% | -1.592 | 511 | 8 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.429 | 515 | 2 | 1% | -1.429 | 515 | 12 | 1% | N/A | N/A | N/A | N/A |
| 10 | -1.277 | 517 | 0 | 0% | -1.277 | 517 | 9 | 1% | N/A | N/A | N/A | N/A |
| 11 | -1.134 | 520 | 0 | 0% | -1.134 | 520 | 12 | 1% | -0.720 | 528 | 2 | 0% |
| 12 | -0.998 | 523 | 0 | 0% | -0.998 | 523 | 23 | 3% | -0.569 | 531 | 0 | 0% |
| 13 | -0.867 | 525 | 0 | 0% | -0.867 | 525 | 30 | 3% | -0.423 | 533 | 1 | 0% |
| 14 | -0.740 | 527 | 0 | 0% | -0.740 | 527 | 44 | 5% | -0.281 | 536 | 13 | 3% |
| 15 | N/A | N/A | N/A | N/A | -0.615 | 530 | 54 | 6% | -0.143 | 539 | 9 | 2% |
| 16 | N/A | N/A | N/A | N/A | -0.494 | 532 | 88 | 10% | -0.007 | 541 | 18 | 4% |
| 17 | N/A | N/A | N/A | N/A | -0.373 | 534 | 72 | 8% | 0.126 | 544 | 41 | 8% |
| 18 | N/A | N/A | N/A | N/A | -0.254 | 537 | 78 | 9% | 0.259 | 546 | 45 | 9% |
| 19 | N/A | N/A | N/A | N/A | -0.134 | 539 | 96 | 11% | 0.391 | 549 | 64 | 13% |
| 20 | N/A | N/A | N/A | N/A | -0.014 | 541 | 100 | 12% | 0.523 | 551 | 62 | 13% |
| 21 | N/A | N/A | N/A | N/A | 0.108 | 543 | 57 | 7% | 0.656 | 554 | 53 | 11% |
| 22 | N/A | N/A | N/A | N/A | 0.232 | 546 | 62 | 7% | 0.792 | 556 | 60 | 12% |
| 23 | N/A | N/A | N/A | N/A | 0.358 | 548 | 32 | 4% | 0.930 | 559 | 41 | 8% |
| 24 | N/A | N/A | N/A | N/A | 0.489 | 550 | 26 | 3% | 1.073 | 561 | 16 | 3% |
| 25 | N/A | N/A | N/A | N/A | 0.625 | 553 | 14 | 2% | 1.222 | 564 | 24 | 5% |
| 26 | N/A | N/A | N/A | N/A | 0.768 | 556 | 12 | 1% | 1.379 | 567 | 20 | 4% |
| 27 | N/A | N/A | N/A | N/A | 0.919 | 559 | 10 | 1% | 1.547 | 570 | 7 | 1% |
| 28 | N/A | N/A | N/A | N/A | 1.082 | 562 | 3 | 0% | 1.730 | 574 | 7 | 1% |
| 29 | N/A | N/A | N/A | N/A | 1.258 | 565 | 0 | 0% | 1.932 | 578 | 2 | 0% |

Table 7.B.10 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.455 | 569 | 0 | 0% | 2.162 | 582 | 1 | 0% |
| 31 | N/A | N/A | N/A | N/A | 1.679 | 573 | 0 | 0% | 2.433 | 587 | 5 | 1% |
| 32 | N/A | N/A | N/A | N/A | 1.942 | 578 | 0 | 0% | 2.768 | 593 | 2 | 0% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.221 | 599 | 2 | 0% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.961 | 599 | 0 | 0% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 599 | 0 | 0% |

Table 7.B.11 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Six

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 600 | 229 | 72% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 601 | 41 | 13% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 603 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.662 | 603 | 10 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -2.931 | 603 | 28 | 9% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -2.487 | 603 | 2 | 1% | -2.487 | 603 | 1 | 0% | N/A | N/A | N/A | N/A |
| 4 | -2.161 | 603 | 3 | 1% | -2.161 | 603 | 2 | 0% | N/A | N/A | N/A | N/A |
| 5 | -1.899 | 606 | 1 | 0% | -1.899 | 606 | 7 | 1% | N/A | N/A | N/A | N/A |
| 6 | -1.677 | 610 | 2 | 1% | -1.677 | 610 | 3 | 0% | N/A | N/A | N/A | N/A |
| 7 | -1.483 | 613 | 1 | 0% | -1.483 | 613 | 9 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.309 | 617 | 0 | 0% | -1.309 | 617 | 8 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.149 | 620 | 1 | 0% | -1.149 | 620 | 7 | 1% | -0.771 | 627 | 1 | 0% |
| 10 | -1.001 | 623 | 0 | 0% | -1.001 | 623 | 16 | 2% | -0.615 | 630 | 1 | 0% |
| 11 | -0.861 | 625 | 0 | 0% | -0.861 | 625 | 21 | 2% | -0.467 | 633 | 3 | 1% |
| 12 | -0.728 | 628 | 1 | 0% | -0.728 | 628 | 43 | 5% | -0.326 | 635 | 0 | 0% |
| 13 | -0.600 | 630 | 0 | 0% | -0.600 | 630 | 48 | 5% | -0.189 | 638 | 6 | 2% |
| 14 | N/A | N/A | N/A | N/A | -0.477 | 632 | 72 | 8% | -0.056 | 640 | 6 | 2% |
| 15 | N/A | N/A | N/A | N/A | -0.355 | 635 | 84 | 9% | 0.076 | 643 | 15 | 4% |
| 16 | N/A | N/A | N/A | N/A | -0.236 | 637 | 98 | 10% | 0.206 | 645 | 22 | 6% |
| 17 | N/A | N/A | N/A | N/A | -0.118 | 639 | 81 | 9% | 0.335 | 648 | 29 | 8% |
| 18 | N/A | N/A | N/A | N/A | 0.001 | 641 | 92 | 10% | 0.465 | 650 | 28 | 7% |
| 19 | N/A | N/A | N/A | N/A | 0.120 | 644 | 84 | 9% | 0.596 | 652 | 45 | 12% |
| 20 | N/A | N/A | N/A | N/A | 0.241 | 646 | 77 | 8% | 0.730 | 655 | 25 | 7% |
| 21 | N/A | N/A | N/A | N/A | 0.365 | 648 | 58 | 6% | 0.866 | 658 | 34 | 9% |
| 22 | N/A | N/A | N/A | N/A | 0.492 | 651 | 36 | 4% | 1.007 | 660 | 25 | 7% |
| 23 | N/A | N/A | N/A | N/A | 0.624 | 653 | 38 | 4% | 1.153 | 663 | 25 | 7% |
| 24 | N/A | N/A | N/A | N/A | 0.762 | 656 | 33 | 4% | 1.307 | 666 | 32 | 9% |
| 25 | N/A | N/A | N/A | N/A | 0.908 | 658 | 12 | 1% | 1.469 | 669 | 23 | 6% |
| 26 | N/A | N/A | N/A | N/A | 1.063 | 661 | 4 | 0% | 1.644 | 672 | 13 | 3% |
| 27 | N/A | N/A | N/A | N/A | 1.232 | 664 | 1 | 0% | 1.835 | 676 | 14 | 4% |
| 28 | N/A | N/A | N/A | N/A | 1.416 | 668 | 0 | 0% | 2.046 | 680 | 10 | 3% |
| 29 | N/A | N/A | N/A | N/A | 1.623 | 672 | 0 | 0% | 2.287 | 684 | 7 | 2% |

Table 7.B.11 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.860 | 676 | 0 | 0% | 2.569 | 689 | 5 | 1% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.918 | 696 | 2 | 1% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.387 | 699 | 1 | 0% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.147 | 699 | 3 | 1% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 699 | 0 | 0% |

Table 7.B.12 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Seven

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 700 | 148 | 55% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 701 | 54 | 20% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 703 | 6 | 2% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.877 | 703 | 16 | 6% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.133 | 703 | 37 | 14% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -2.677 | 703 | 0 | 0% | -2.677 | 703 | 4 | 1% | N/A | N/A | N/A | N/A |
| 4 | -2.340 | 703 | 2 | 1% | -2.340 | 703 | 4 | 1% | N/A | N/A | N/A | N/A |
| 5 | -2.068 | 703 | 1 | 0% | -2.068 | 703 | 4 | 1% | N/A | N/A | N/A | N/A |
| 6 | -1.837 | 707 | 2 | 1% | -1.837 | 707 | 4 | 1% | N/A | N/A | N/A | N/A |
| 7 | -1.635 | 711 | 0 | 0% | -1.635 | 711 | 5 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.455 | 714 | 0 | 0% | -1.455 | 714 | 4 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.290 | 717 | 2 | 1% | -1.290 | 717 | 5 | 1% | -0.920 | 724 | 0 | 0% |
| 10 | -1.137 | 720 | 1 | 0% | -1.137 | 720 | 6 | 1% | -0.772 | 727 | 0 | 0% |
| 11 | -0.994 | 723 | 1 | 0% | -0.994 | 723 | 16 | 2% | -0.633 | 729 | 0 | 0% |
| 12 | -0.860 | 725 | 0 | 0% | -0.860 | 725 | 24 | 4% | -0.502 | 732 | 2 | 0% |
| 13 | -0.731 | 728 | 0 | 0% | -0.731 | 728 | 35 | 5% | -0.377 | 734 | 2 | 0% |
| 14 | -0.607 | 730 | 0 | 0% | -0.607 | 730 | 59 | 9% | -0.257 | 736 | 7 | 1% |
| 15 | N/A | N/A | N/A | N/A | -0.487 | 732 | 50 | 7% | -0.140 | 739 | 12 | 2% |
| 16 | N/A | N/A | N/A | N/A | -0.370 | 734 | 62 | 9% | -0.026 | 741 | 15 | 2% |
| 17 | N/A | N/A | N/A | N/A | -0.255 | 737 | 67 | 10% | 0.088 | 743 | 33 | 5% |
| 18 | N/A | N/A | N/A | N/A | -0.141 | 739 | 68 | 10% | 0.201 | 745 | 31 | 5% |
| 19 | N/A | N/A | N/A | N/A | -0.027 | 741 | 73 | 11% | 0.315 | 747 | 47 | 8% |
| 20 | N/A | N/A | N/A | N/A | 0.087 | 743 | 49 | 7% | 0.430 | 749 | 54 | 9% |
| 21 | N/A | N/A | N/A | N/A | 0.202 | 745 | 44 | 6% | 0.548 | 752 | 67 | 11% |
| 22 | N/A | N/A | N/A | N/A | 0.319 | 747 | 31 | 5% | 0.668 | 754 | 45 | 7% |
| 23 | N/A | N/A | N/A | N/A | 0.438 | 750 | 25 | 4% | 0.792 | 756 | 52 | 8% |
| 24 | N/A | N/A | N/A | N/A | 0.562 | 752 | 15 | 2% | 0.921 | 759 | 54 | 9% |
| 25 | N/A | N/A | N/A | N/A | 0.690 | 754 | 9 | 1% | 1.056 | 761 | 49 | 8% |
| 26 | N/A | N/A | N/A | N/A | 0.825 | 757 | 9 | 1% | 1.198 | 764 | 32 | 5% |
| 27 | N/A | N/A | N/A | N/A | 0.968 | 759 | 6 | 1% | 1.349 | 767 | 23 | 4% |
| 28 | N/A | N/A | N/A | N/A | 1.120 | 762 | 1 | 0% | 1.512 | 770 | 27 | 4% |
| 29 | N/A | N/A | N/A | N/A | 1.286 | 765 | 0 | 0% | 1.688 | 773 | 18 | 3% |

Table 7.B.12 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.467 | 769 | 0 | 0% | 1.881 | 777 | 15 | 2% |
| 31 | N/A | N/A | N/A | N/A | 1.671 | 773 | 0 | 0% | 2.098 | 781 | 8 | 1% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.346 | 785 | 8 | 1% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.638 | 791 | 3 | 0% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.999 | 798 | 3 | 0% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.482 | 799 | 0 | 0% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.256 | 799 | 5 | 1% |
| 37 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 799 | 1 | 0% |

Table 7.B.13 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Eight

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 800 | 178 | 69% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 801 | 33 | 13% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 803 | 1 | 0% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.975 | 803 | 7 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.232 | 803 | 15 | 6% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 3 | -2.776 | 803 | 13 | 5% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 4 | -2.439 | 803 | 2 | 1% | -2.439 | 803 | 0 | 0% | N/A | N/A | N/A | N/A |
| 5 | -2.166 | 803 | 1 | 0% | -2.166 | 803 | 1 | 0% | N/A | N/A | N/A | N/A |
| 6 | -1.935 | 805 | 0 | 0% | -1.935 | 805 | 3 | 1% | N/A | N/A | N/A | N/A |
| 7 | -1.733 | 809 | 2 | 1% | -1.733 | 809 | 2 | 0% | N/A | N/A | N/A | N/A |
| 8 | -1.551 | 812 | 2 | 1% | -1.551 | 812 | 5 | 1% | N/A | N/A | N/A | N/A |
| 9 | -1.385 | 815 | 1 | 0% | -1.385 | 815 | 4 | 1% | N/A | N/A | N/A | N/A |
| 10 | -1.231 | 818 | 0 | 0% | -1.231 | 818 | 5 | 1% | -0.804 | 826 | 2 | 0% |
| 11 | -1.087 | 821 | 0 | 0% | -1.087 | 821 | 8 | 1% | -0.654 | 829 | 2 | 0% |
| 12 | -0.950 | 823 | 3 | 1% | -0.950 | 823 | 18 | 3% | -0.511 | 832 | 5 | 1% |
| 13 | -0.820 | 826 | 0 | 0% | -0.820 | 826 | 27 | 5% | -0.374 | 834 | 4 | 1% |
| 14 | -0.694 | 828 | 0 | 0% | -0.694 | 828 | 39 | 7% | -0.240 | 837 | 15 | 2% |
| 15 | -0.572 | 831 | 0 | 0% | -0.572 | 831 | 49 | 9% | -0.110 | 839 | 18 | 3% |
| 16 | -0.454 | 833 | 0 | 0% | -0.454 | 833 | 83 | 14% | 0.018 | 842 | 32 | 5% |
| 17 | N/A | N/A | N/A | N/A | -0.337 | 835 | 59 | 10% | 0.144 | 844 | 49 | 7% |
| 18 | N/A | N/A | N/A | N/A | -0.222 | 837 | 63 | 11% | 0.270 | 846 | 46 | 7% |
| 19 | N/A | N/A | N/A | N/A | -0.108 | 839 | 67 | 12% | 0.396 | 849 | 75 | 11% |
| 20 | N/A | N/A | N/A | N/A | 0.007 | 841 | 41 | 7% | 0.523 | 851 | 73 | 10% |
| 21 | N/A | N/A | N/A | N/A | 0.123 | 844 | 42 | 7% | 0.653 | 854 | 50 | 7% |
| 22 | N/A | N/A | N/A | N/A | 0.240 | 846 | 19 | 3% | 0.785 | 856 | 55 | 8% |
| 23 | N/A | N/A | N/A | N/A | 0.360 | 848 | 24 | 4% | 0.920 | 859 | 51 | 7% |
| 24 | N/A | N/A | N/A | N/A | 0.483 | 850 | 8 | 1% | 1.061 | 861 | 43 | 6% |
| 25 | N/A | N/A | N/A | N/A | 0.611 | 853 | 2 | 0% | 1.207 | 864 | 36 | 5% |
| 26 | N/A | N/A | N/A | N/A | 0.746 | 855 | 2 | 0% | 1.361 | 867 | 25 | 4% |
| 27 | N/A | N/A | N/A | N/A | 0.888 | 858 | 2 | 0% | 1.525 | 870 | 23 | 3% |
| 28 | N/A | N/A | N/A | N/A | 1.042 | 861 | 0 | 0% | 1.701 | 873 | 35 | 5% |
| 29 | N/A | N/A | N/A | N/A | 1.210 | 864 | 0 | 0% | 1.893 | 877 | 17 | 2% |

Table 7.B.13 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.105 | 881 | 19 | 3% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.346 | 885 | 10 | 1% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.628 | 891 | 5 | 1% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.975 | 897 | 4 | 1% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.440 | 899 | 1 | 0% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.193 | 899 | 1 | 0% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 899 | 0 | 0% |

Table 7.B.14 Raw-Score-to-Scale-Score Distribution—Mathematics, Grade Eleven

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| LOSS | N/A | 900 | 180 | 73% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LOSS+1 | N/A | 901 | 43 | 18% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 0 | -6.000 | 903 | 2 | 1% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1 | -3.787 | 903 | 8 | 3% | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2 | -3.037 | 903 | 1 | 0% | -3.037 | 903 | 1 | 0% | N/A | N/A | N/A | N/A |
| 3 | -2.582 | 903 | 3 | 1% | -2.582 | 903 | 6 | 1% | N/A | N/A | N/A | N/A |
| 4 | -2.252 | 903 | 2 | 1% | -2.252 | 903 | 5 | 1% | N/A | N/A | N/A | N/A |
| 5 | -1.991 | 904 | 1 | 0% | -1.991 | 904 | 6 | 1% | N/A | N/A | N/A | N/A |
| 6 | -1.774 | 908 | 0 | 0% | -1.774 | 908 | 4 | 1% | N/A | N/A | N/A | N/A |
| 7 | -1.587 | 912 | 1 | 0% | -1.587 | 912 | 6 | 1% | N/A | N/A | N/A | N/A |
| 8 | -1.422 | 915 | 0 | 0% | -1.422 | 915 | 9 | 2% | N/A | N/A | N/A | N/A |
| 9 | -1.274 | 917 | 1 | 0% | -1.274 | 917 | 7 | 1% | N/A | N/A | N/A | N/A |
| 10 | -1.138 | 920 | 2 | 1% | -1.138 | 920 | 17 | 3% | N/A | N/A | N/A | N/A |
| 11 | -1.013 | 922 | 1 | 0% | -1.013 | 922 | 23 | 4% | -0.783 | 927 | 0 | 0% |
| 12 | -0.895 | 925 | 0 | 0% | -0.895 | 925 | 29 | 5% | -0.660 | 929 | 0 | 0% |
| 13 | -0.783 | 927 | 0 | 0% | -0.783 | 927 | 24 | 4% | -0.542 | 931 | 0 | 0% |
| 14 | -0.676 | 929 | 0 | 0% | -0.676 | 929 | 50 | 9% | -0.428 | 933 | 1 | 0% |
| 15 | -0.573 | 931 | 0 | 0% | -0.573 | 931 | 52 | 9% | -0.316 | 935 | 1 | 0% |
| 16 | N/A | N/A | N/A | N/A | -0.472 | 932 | 47 | 8% | -0.206 | 937 | 4 | 1% |
| 17 | N/A | N/A | N/A | N/A | -0.373 | 934 | 42 | 7% | -0.096 | 939 | 9 | 2% |
| 18 | N/A | N/A | N/A | N/A | -0.275 | 936 | 47 | 8% | 0.014 | 942 | 16 | 3% |
| 19 | N/A | N/A | N/A | N/A | -0.178 | 938 | 48 | 8% | 0.126 | 944 | 25 | 5% |
| 20 | N/A | N/A | N/A | N/A | -0.079 | 940 | 39 | 7% | 0.241 | 946 | 41 | 8% |
| 21 | N/A | N/A | N/A | N/A | 0.021 | 942 | 28 | 5% | 0.359 | 948 | 58 | 11% |
| 22 | N/A | N/A | N/A | N/A | 0.123 | 944 | 33 | 6% | 0.482 | 950 | 47 | 9% |
| 23 | N/A | N/A | N/A | N/A | 0.230 | 946 | 20 | 3% | 0.610 | 953 | 53 | 10% |
| 24 | N/A | N/A | N/A | N/A | 0.341 | 948 | 17 | 3% | 0.745 | 955 | 59 | 12% |
| 25 | N/A | N/A | N/A | N/A | 0.458 | 950 | 10 | 2% | 0.886 | 958 | 50 | 10% |
| 26 | N/A | N/A | N/A | N/A | 0.584 | 952 | 5 | 1% | 1.037 | 961 | 32 | 6% |
| 27 | N/A | N/A | N/A | N/A | 0.722 | 955 | 4 | 1% | 1.196 | 964 | 22 | 4% |
| 28 | N/A | N/A | N/A | N/A | 0.873 | 958 | 4 | 1% | 1.366 | 967 | 29 | 6% |
| 29 | N/A | N/A | N/A | N/A | 1.045 | 961 | 0 | 0% | 1.549 | 970 | 25 | 5% |

Table 7.B.14 *(continuation)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Raw Score | Early Exit Theta | Early Exit Scale Score | Early Exit N | Early Exit Percent | Easy Pathway Theta | Easy Pathway Scale Score | Easy Pathway N | Easy Pathway Percent | Hard Pathway Theta | Hard Pathway Scale Score | Hard Pathway N | Hard Pathway Percent |
| 30 | N/A | N/A | N/A | N/A | 1.244 | 965 | 1 | 0% | 1.746 | 974 | 14 | 3% |
| 31 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1.962 | 978 | 6 | 1% |
| 32 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.203 | 983 | 10 | 2% |
| 33 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.481 | 988 | 4 | 1% |
| 34 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.817 | 994 | 1 | 0% |
| 35 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.266 | 999 | 0 | 0% |
| 36 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 3.997 | 999 | 0 | 0% |
| 37 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 6.000 | 999 | 0 | 0% |

### Appendix 7.C: Scale Scores

Table 7.C.1 Percentiles of Scale Scores in ELA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Percentile | Grade 3 | Grade 4 | Grade 5 | Grade 6 | Grade 7 | Grade 8 | Grade 11 |
| p1 | 300 | 400 | 500 | 600 | 700 | 800 | 900 |
| p10 | 300 | 400 | 501 | 601 | 701 | 801 | 900 |
| p20 | 303 | 412 | 524 | 629 | 728 | 835 | 930 |
| p30 | 332 | 431 | 533 | 638 | 737 | 841 | 940 |
| p40 | 340 | 436 | 539 | 642 | 742 | 844 | 945 |
| p50 | 345 | 441 | 544 | 646 | 747 | 848 | 949 |
| p60 | 349 | 445 | 548 | 649 | 751 | 851 | 953 |
| p70 | 353 | 451 | 554 | 653 | 753 | 854 | 955 |
| p80 | 360 | 455 | 559 | 657 | 757 | 856 | 959 |
| p90 | 372 | 462 | 569 | 664 | 765 | 861 | 963 |
| p99 | 399 | 480 | 596 | 680 | 778 | 873 | 974 |

Table 7.C.2 Percentiles of Scale Scores in Mathematics

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Percentile | Grade 3 | Grade 4 | Grade 5 | Grade 6 | Grade 7 | Grade 8 | Grade 11 |
| p1 | 300 | 400 | 500 | 600 | 700 | 800 | 900 |
| p10 | 300 | 400 | 500 | 600 | 701 | 800 | 900 |
| p20 | 301 | 403 | 511 | 610 | 723 | 826 | 912 |
| p30 | 323 | 424 | 530 | 632 | 732 | 833 | 929 |
| p40 | 332 | 431 | 534 | 637 | 737 | 837 | 934 |
| p50 | 337 | 436 | 539 | 639 | 741 | 841 | 938 |
| p60 | 342 | 440 | 541 | 644 | 745 | 846 | 944 |
| p70 | 344 | 445 | 546 | 648 | 750 | 850 | 948 |
| p80 | 349 | 449 | 551 | 652 | 756 | 856 | 953 |
| p90 | 357 | 455 | 556 | 660 | 761 | 864 | 961 |
| p99 | 377 | 479 | 574 | 684 | 785 | 885 | 983 |

**Note:** In table 7.C.3 through table 7.C.16, an expression that opens and closes with a bracket indicates that a value is greater than or equal to the first number and is less than or equal to the second number. For example, “[345, 347]” indicates a value greater than or equal to 345 but less than or equal to 347.

Table 7.C.3 Frequency Distribution of Overall Scale Scores—ELA, Grade Three

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [300, 302] | 267 | 267 | 17% | 17% |
| [303, 305] | 50 | 317 | 3% | 20% |
| [306, 308] | 9 | 326 | 1% | 21% |
| [309, 311] | 9 | 335 | 1% | 21% |
| [312, 314] | 7 | 342 | 0% | 22% |
| [315, 317] | 6 | 348 | 0% | 22% |
| [318, 320] | 23 | 371 | 1% | 23% |
| [321, 323] | 12 | 383 | 1% | 24% |
| [324, 326] | 27 | 410 | 2% | 26% |
| [327, 329] | 20 | 430 | 1% | 27% |
| [330, 332] | 53 | 483 | 3% | 31% |
| [333, 335] | 31 | 514 | 2% | 33% |
| [336, 338] | 85 | 599 | 5% | 38% |
| [339, 341] | 118 | 717 | 7% | 45% |
| [342, 344] | 65 | 782 | 4% | 49% |
| [345, 347] | 116 | 898 | 7% | 57% |
| [348, 350] | 68 | 966 | 4% | 61% |
| [351, 353] | 148 | 1,114 | 9% | 70% |
| [354, 356] | 54 | 1,168 | 3% | 74% |
| [357, 359] | 55 | 1,223 | 3% | 77% |
| [360, 362] | 48 | 1,271 | 3% | 80% |
| [363, 365] | 110 | 1,381 | 7% | 87% |
| [366, 368] | 40 | 1,421 | 3% | 90% |
| [369, 371] | 0 | 1,421 | 0% | 90% |
| [372, 374] | 43 | 1,464 | 3% | 93% |
| [375, 377] | 37 | 1,501 | 2% | 95% |
| [378, 380] | 0 | 1,501 | 0% | 95% |
| [381, 383] | 29 | 1,530 | 2% | 97% |
| [384, 386] | 0 | 1,530 | 0% | 97% |
| [387, 389] | 23 | 1,553 | 1% | 98% |
| [390, 392] | 0 | 1,553 | 0% | 98% |
| [393, 395] | 0 | 1,553 | 0% | 98% |
| [396, 398] | 0 | 1,553 | 0% | 98% |
| [399, 399] | 28 | 1,581 | 2% | 100% |

Table 7.C.4 Frequency Distribution of Overall Scale Scores—ELA, Grade Four

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [400, 402] | 265 | 265 | 16% | 16% |
| [403, 405] | 49 | 314 | 3% | 18% |
| [406, 408] | 10 | 324 | 1% | 19% |
| [409, 411] | 9 | 333 | 1% | 20% |
| [412, 414] | 8 | 341 | 0% | 20% |
| [415, 417] | 26 | 367 | 2% | 22% |
| [418, 420] | 11 | 378 | 1% | 22% |
| [421, 423] | 17 | 395 | 1% | 23% |
| [424, 426] | 40 | 435 | 2% | 26% |
| [427, 429] | 63 | 498 | 4% | 29% |
| [430, 432] | 44 | 542 | 3% | 32% |
| [433, 435] | 101 | 643 | 6% | 38% |
| [436, 438] | 132 | 775 | 8% | 46% |
| [439, 441] | 115 | 890 | 7% | 52% |
| [442, 444] | 65 | 955 | 4% | 56% |
| [445, 447] | 134 | 1,089 | 8% | 64% |
| [448, 450] | 52 | 1,141 | 3% | 67% |
| [451, 453] | 154 | 1,295 | 9% | 76% |
| [454, 456] | 70 | 1,365 | 4% | 80% |
| [457, 459] | 116 | 1,481 | 7% | 87% |
| [460, 462] | 52 | 1,533 | 3% | 90% |
| [463, 465] | 52 | 1,585 | 3% | 93% |
| [466, 468] | 46 | 1,631 | 3% | 96% |
| [469, 471] | 22 | 1,653 | 1% | 97% |
| [472, 474] | 0 | 1,653 | 0% | 97% |
| [475, 477] | 25 | 1,678 | 1% | 99% |
| [478, 480] | 12 | 1,690 | 1% | 99% |
| [481, 483] | 0 | 1,690 | 0% | 99% |
| [484, 486] | 0 | 1,690 | 0% | 99% |
| [487, 489] | 7 | 1,697 | 0% | 100% |
| [490, 492] | 0 | 1,697 | 0% | 100% |
| [493, 495] | 0 | 1,697 | 0% | 100% |
| [496, 498] | 3 | 1,700 | 0% | 100% |
| [499, 499] | 1 | 1,701 | 0% | 100% |

Table 7.C.5 Frequency Distribution of Overall Scale Scores—ELA, Grade Five

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [500, 502] | 204 | 204 | 12% | 12% |
| [503, 505] | 79 | 283 | 5% | 17% |
| [506, 508] | 5 | 288 | 0% | 17% |
| [509, 511] | 7 | 295 | 0% | 17% |
| [512, 514] | 7 | 302 | 0% | 18% |
| [515, 517] | 10 | 312 | 1% | 18% |
| [518, 520] | 8 | 320 | 0% | 19% |
| [521, 523] | 16 | 336 | 1% | 20% |
| [524, 526] | 50 | 386 | 3% | 23% |
| [527, 529] | 35 | 421 | 2% | 25% |
| [530, 532] | 74 | 495 | 4% | 29% |
| [533, 535] | 95 | 590 | 6% | 35% |
| [536, 538] | 72 | 662 | 4% | 39% |
| [539, 541] | 90 | 752 | 5% | 44% |
| [542, 544] | 116 | 868 | 7% | 51% |
| [545, 547] | 79 | 947 | 5% | 56% |
| [548, 550] | 162 | 1,109 | 10% | 65% |
| [551, 553] | 73 | 1,182 | 4% | 70% |
| [554, 556] | 69 | 1,251 | 4% | 74% |
| [557, 559] | 121 | 1,372 | 7% | 81% |
| [560, 562] | 64 | 1,436 | 4% | 85% |
| [563, 565] | 60 | 1,496 | 4% | 88% |
| [566, 568] | 0 | 1,496 | 0% | 88% |
| [569, 571] | 70 | 1,566 | 4% | 92% |
| [572, 574] | 54 | 1,620 | 3% | 96% |
| [575, 577] | 0 | 1,620 | 0% | 96% |
| [578, 580] | 28 | 1,648 | 2% | 97% |
| [581, 583] | 0 | 1,648 | 0% | 97% |
| [584, 586] | 28 | 1,676 | 2% | 99% |
| [587, 589] | 0 | 1,676 | 0% | 99% |
| [590, 592] | 0 | 1,676 | 0% | 99% |
| [593, 595] | 0 | 1,676 | 0% | 99% |
| [596, 598] | 14 | 1,690 | 1% | 100% |
| [599, 599] | 4 | 1,694 | 0% | 100% |

Table 7.C.6 Frequency Distribution of Overall Scale Scores—ELA, Grade Six

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [600, 602] | 205 | 205 | 12% | 12% |
| [603, 605] | 23 | 228 | 1% | 14% |
| [606, 608] | 14 | 242 | 1% | 15% |
| [609, 611] | 4 | 246 | 0% | 15% |
| [612, 614] | 6 | 252 | 0% | 15% |
| [615, 617] | 6 | 258 | 0% | 16% |
| [618, 620] | 18 | 276 | 1% | 17% |
| [621, 623] | 13 | 289 | 1% | 17% |
| [624, 626] | 24 | 313 | 1% | 19% |
| [627, 629] | 25 | 338 | 2% | 20% |
| [630, 632] | 41 | 379 | 2% | 23% |
| [633, 635] | 44 | 423 | 3% | 26% |
| [636, 638] | 93 | 516 | 6% | 31% |
| [639, 641] | 101 | 617 | 6% | 37% |
| [642, 644] | 119 | 736 | 7% | 45% |
| [645, 647] | 158 | 894 | 10% | 54% |
| [648, 650] | 166 | 1,060 | 10% | 64% |
| [651, 653] | 157 | 1,217 | 9% | 74% |
| [654, 656] | 64 | 1,281 | 4% | 77% |
| [657, 659] | 126 | 1,407 | 8% | 85% |
| [660, 662] | 56 | 1,463 | 3% | 89% |
| [663, 665] | 53 | 1,516 | 3% | 92% |
| [666, 668] | 40 | 1,556 | 2% | 94% |
| [669, 671] | 44 | 1,600 | 3% | 97% |
| [672, 674] | 30 | 1,630 | 2% | 99% |
| [675, 677] | 0 | 1,630 | 0% | 99% |
| [678, 680] | 12 | 1,642 | 1% | 99% |
| [681, 683] | 0 | 1,642 | 0% | 99% |
| [684, 686] | 0 | 1,642 | 0% | 99% |
| [687, 689] | 10 | 1,652 | 1% | 100% |
| [690, 692] | 0 | 1,652 | 0% | 100% |
| [693, 695] | 0 | 1,652 | 0% | 100% |
| [696, 698] | 0 | 1,652 | 0% | 100% |
| [699, 699] | 1 | 1,653 | 0% | 100% |

Table 7.C.7 Frequency Distribution of Overall Scale Scores—ELA, Grade Seven

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [700, 702] | 196 | 196 | 12% | 12% |
| [703, 705] | 20 | 216 | 1% | 14% |
| [706, 708] | 9 | 225 | 1% | 14% |
| [709, 711] | 6 | 231 | 0% | 15% |
| [712, 714] | 7 | 238 | 0% | 15% |
| [715, 717] | 8 | 246 | 1% | 16% |
| [718, 720] | 9 | 255 | 1% | 16% |
| [721, 723] | 9 | 264 | 1% | 17% |
| [724, 726] | 34 | 298 | 2% | 19% |
| [727, 729] | 25 | 323 | 2% | 20% |
| [730, 732] | 80 | 403 | 5% | 25% |
| [733, 735] | 59 | 462 | 4% | 29% |
| [736, 738] | 62 | 524 | 4% | 33% |
| [739, 741] | 91 | 615 | 6% | 39% |
| [742, 744] | 53 | 668 | 3% | 42% |
| [745, 747] | 177 | 845 | 11% | 53% |
| [748, 750] | 76 | 921 | 5% | 58% |
| [751, 753] | 201 | 1,122 | 13% | 71% |
| [754, 756] | 82 | 1,204 | 5% | 76% |
| [757, 759] | 64 | 1,268 | 4% | 80% |
| [760, 762] | 124 | 1,392 | 8% | 88% |
| [763, 765] | 44 | 1,436 | 3% | 91% |
| [766, 768] | 45 | 1,481 | 3% | 94% |
| [769, 771] | 36 | 1,517 | 2% | 96% |
| [772, 774] | 33 | 1,550 | 2% | 98% |
| [775, 777] | 0 | 1,550 | 0% | 98% |
| [778, 780] | 17 | 1,567 | 1% | 99% |
| [781, 783] | 8 | 1,575 | 1% | 100% |
| [784, 786] | 0 | 1,575 | 0% | 100% |
| [787, 789] | 0 | 1,575 | 0% | 100% |
| [790, 792] | 5 | 1,580 | 0% | 100% |
| [793, 795] | 0 | 1,580 | 0% | 100% |
| [796, 798] | 0 | 1,580 | 0% | 100% |
| [799, 799] | 2 | 1,582 | 0% | 100% |

Table 7.C.8 Frequency Distribution of Overall Scale Scores—ELA, Grade Eight

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [800, 802] | 186 | 186 | 12% | 12% |
| [803, 805] | 18 | 204 | 1% | 13% |
| [806, 808] | 2 | 206 | 0% | 13% |
| [809, 811] | 3 | 209 | 0% | 14% |
| [812, 814] | 6 | 215 | 0% | 14% |
| [815, 817] | 7 | 222 | 0% | 14% |
| [818, 820] | 11 | 233 | 1% | 15% |
| [821, 823] | 7 | 240 | 0% | 16% |
| [824, 826] | 3 | 243 | 0% | 16% |
| [827, 829] | 16 | 259 | 1% | 17% |
| [830, 832] | 19 | 278 | 1% | 18% |
| [833, 835] | 46 | 324 | 3% | 21% |
| [836, 838] | 57 | 381 | 4% | 25% |
| [839, 841] | 114 | 495 | 7% | 32% |
| [842, 844] | 137 | 632 | 9% | 41% |
| [845, 847] | 120 | 752 | 8% | 49% |
| [848, 850] | 141 | 893 | 9% | 58% |
| [851, 853] | 173 | 1,066 | 11% | 69% |
| [854, 856] | 181 | 1,247 | 12% | 81% |
| [857, 859] | 128 | 1,375 | 8% | 89% |
| [860, 862] | 46 | 1,421 | 3% | 92% |
| [863, 865] | 41 | 1,462 | 3% | 95% |
| [866, 868] | 46 | 1,508 | 3% | 97% |
| [869, 871] | 8 | 1,516 | 1% | 98% |
| [872, 874] | 16 | 1,532 | 1% | 99% |
| [875, 877] | 8 | 1,540 | 1% | 100% |
| [878, 880] | 0 | 1,540 | 0% | 100% |
| [881, 883] | 5 | 1,545 | 0% | 100% |
| [884, 886] | 0 | 1,545 | 0% | 100% |
| [887, 889] | 2 | 1,547 | 0% | 100% |
| [890, 892] | 0 | 1,547 | 0% | 100% |
| [893, 895] | 0 | 1,547 | 0% | 100% |
| [896, 898] | 0 | 1,547 | 0% | 100% |
| [899, 899] | 0 | 1,547 | 0% | 100% |

Table 7.C.9 Frequency Distribution of Overall Scale Scores—ELA, Grade Eleven

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [900, 902] | 187 | 187 | 14% | 14% |
| [903, 905] | 21 | 208 | 2% | 15% |
| [906, 908] | 7 | 215 | 1% | 16% |
| [909, 911] | 3 | 218 | 0% | 16% |
| [912, 914] | 0 | 218 | 0% | 16% |
| [915, 917] | 6 | 224 | 0% | 16% |
| [918, 920] | 8 | 232 | 1% | 17% |
| [921, 923] | 13 | 245 | 1% | 18% |
| [924, 926] | 8 | 253 | 1% | 19% |
| [927, 929] | 14 | 267 | 1% | 20% |
| [930, 932] | 27 | 294 | 2% | 22% |
| [933, 935] | 39 | 333 | 3% | 24% |
| [936, 938] | 31 | 364 | 2% | 27% |
| [939, 941] | 60 | 424 | 4% | 31% |
| [942, 944] | 107 | 531 | 8% | 39% |
| [945, 947] | 86 | 617 | 6% | 45% |
| [948, 950] | 108 | 725 | 8% | 53% |
| [951, 953] | 142 | 867 | 10% | 64% |
| [954, 956] | 151 | 1,018 | 11% | 75% |
| [957, 959] | 121 | 1,139 | 9% | 84% |
| [960, 962] | 58 | 1,197 | 4% | 88% |
| [963, 965] | 48 | 1,245 | 4% | 92% |
| [966, 968] | 70 | 1,315 | 5% | 97% |
| [969, 971] | 24 | 1,339 | 2% | 98% |
| [972, 974] | 11 | 1,350 | 1% | 99% |
| [975, 977] | 6 | 1,356 | 0% | 100% |
| [978, 980] | 0 | 1,356 | 0% | 100% |
| [981, 983] | 4 | 1,360 | 0% | 100% |
| [984, 986] | 0 | 1,360 | 0% | 100% |
| [987, 989] | 0 | 1,360 | 0% | 100% |
| [990, 992] | 0 | 1,360 | 0% | 100% |
| [993, 995] | 0 | 1,360 | 0% | 100% |
| [996, 998] | 0 | 1,360 | 0% | 100% |
| [999, 999] | 0 | 1,360 | 0% | 100% |

Table 7.C.10 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Three

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [300, 302] | 317 | 317 | 20% | 20% |
| [303, 305] | 66 | 383 | 4% | 25% |
| [306, 308] | 7 | 390 | 0% | 25% |
| [309, 311] | 13 | 403 | 1% | 26% |
| [312, 314] | 9 | 412 | 1% | 26% |
| [315, 317] | 16 | 428 | 1% | 27% |
| [318, 320] | 28 | 456 | 2% | 29% |
| [321, 323] | 13 | 469 | 1% | 30% |
| [324, 326] | 36 | 505 | 2% | 32% |
| [327, 329] | 50 | 555 | 3% | 36% |
| [330, 332] | 73 | 628 | 5% | 40% |
| [333, 335] | 82 | 710 | 5% | 45% |
| [336, 338] | 87 | 797 | 6% | 51% |
| [339, 341] | 102 | 899 | 7% | 58% |
| [342, 344] | 197 | 1,096 | 13% | 70% |
| [345, 347] | 90 | 1,186 | 6% | 76% |
| [348, 350] | 78 | 1,264 | 5% | 81% |
| [351, 353] | 69 | 1,333 | 4% | 85% |
| [354, 356] | 62 | 1,395 | 4% | 89% |
| [357, 359] | 72 | 1,467 | 5% | 94% |
| [360, 362] | 25 | 1,492 | 2% | 96% |
| [363, 365] | 15 | 1,507 | 1% | 97% |
| [366, 368] | 18 | 1,525 | 1% | 98% |
| [369, 371] | 11 | 1,536 | 1% | 98% |
| [372, 374] | 0 | 1,536 | 0% | 98% |
| [375, 377] | 10 | 1,546 | 1% | 99% |
| [378, 380] | 4 | 1,550 | 0% | 99% |
| [381, 383] | 4 | 1,554 | 0% | 100% |
| [384, 386] | 0 | 1,554 | 0% | 100% |
| [387, 389] | 2 | 1,556 | 0% | 100% |
| [390, 392] | 0 | 1,556 | 0% | 100% |
| [393, 395] | 3 | 1,559 | 0% | 100% |
| [396, 398] | 0 | 1,559 | 0% | 100% |
| [399, 399] | 2 | 1,561 | 0% | 100% |

Table 7.C.11 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Four

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [400, 402] | 277 | 277 | 16% | 16% |
| [403, 405] | 69 | 346 | 4% | 21% |
| [406, 408] | 12 | 358 | 1% | 21% |
| [409, 411] | 20 | 378 | 1% | 22% |
| [412, 414] | 27 | 405 | 2% | 24% |
| [415, 417] | 19 | 424 | 1% | 25% |
| [418, 420] | 30 | 454 | 2% | 27% |
| [421, 423] | 38 | 492 | 2% | 29% |
| [424, 426] | 41 | 533 | 2% | 32% |
| [427, 429] | 106 | 639 | 6% | 38% |
| [430, 432] | 74 | 713 | 4% | 42% |
| [433, 435] | 128 | 841 | 8% | 50% |
| [436, 438] | 98 | 939 | 6% | 56% |
| [439, 441] | 87 | 1,026 | 5% | 61% |
| [442, 444] | 126 | 1,152 | 7% | 68% |
| [445, 447] | 148 | 1,300 | 9% | 77% |
| [448, 450] | 98 | 1,398 | 6% | 83% |
| [451, 453] | 65 | 1,463 | 4% | 87% |
| [454, 456] | 95 | 1,558 | 6% | 92% |
| [457, 459] | 29 | 1,587 | 2% | 94% |
| [460, 462] | 26 | 1,613 | 2% | 96% |
| [463, 465] | 20 | 1,633 | 1% | 97% |
| [466, 468] | 9 | 1,642 | 1% | 97% |
| [469, 471] | 11 | 1,653 | 1% | 98% |
| [472, 474] | 10 | 1,663 | 1% | 99% |
| [475, 477] | 0 | 1,663 | 0% | 99% |
| [478, 480] | 10 | 1,673 | 1% | 99% |
| [481, 483] | 0 | 1,673 | 0% | 99% |
| [484, 486] | 2 | 1,675 | 0% | 99% |
| [487, 489] | 0 | 1,675 | 0% | 99% |
| [490, 492] | 2 | 1,677 | 0% | 100% |
| [493, 495] | 0 | 1,677 | 0% | 100% |
| [496, 498] | 0 | 1,677 | 0% | 100% |
| [499, 499] | 8 | 1,685 | 0% | 100% |

Table 7.C.12 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Five

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [500, 502] | 252 | 252 | 15% | 15% |
| [503, 505] | 75 | 327 | 4% | 20% |
| [506, 508] | 4 | 331 | 0% | 20% |
| [509, 511] | 10 | 341 | 1% | 20% |
| [512, 514] | 0 | 341 | 0% | 20% |
| [515, 517] | 23 | 364 | 1% | 22% |
| [518, 520] | 12 | 376 | 1% | 22% |
| [521, 523] | 23 | 399 | 1% | 24% |
| [524, 526] | 30 | 429 | 2% | 26% |
| [527, 529] | 46 | 475 | 3% | 28% |
| [530, 532] | 142 | 617 | 8% | 37% |
| [533, 535] | 73 | 690 | 4% | 41% |
| [536, 538] | 91 | 781 | 5% | 47% |
| [539, 541] | 223 | 1,004 | 13% | 60% |
| [542, 544] | 98 | 1,102 | 6% | 66% |
| [545, 547] | 107 | 1,209 | 6% | 72% |
| [548, 550] | 122 | 1,331 | 7% | 80% |
| [551, 553] | 76 | 1,407 | 5% | 84% |
| [554, 556] | 125 | 1,532 | 7% | 92% |
| [557, 559] | 51 | 1,583 | 3% | 95% |
| [560, 562] | 19 | 1,602 | 1% | 96% |
| [563, 565] | 24 | 1,626 | 1% | 97% |
| [566, 568] | 20 | 1,646 | 1% | 98% |
| [569, 571] | 7 | 1,653 | 0% | 99% |
| [572, 574] | 7 | 1,660 | 0% | 99% |
| [575, 577] | 0 | 1,660 | 0% | 99% |
| [578, 580] | 2 | 1,662 | 0% | 99% |
| [581, 583] | 1 | 1,663 | 0% | 99% |
| [584, 586] | 0 | 1,663 | 0% | 99% |
| [587, 589] | 5 | 1,668 | 0% | 100% |
| [590, 592] | 0 | 1,668 | 0% | 100% |
| [593, 595] | 2 | 1,670 | 0% | 100% |
| [596, 598] | 0 | 1,670 | 0% | 100% |
| [599, 599] | 2 | 1,672 | 0% | 100% |

Table 7.C.13 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Six

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [600, 602] | 270 | 270 | 17% | 17% |
| [603, 605] | 47 | 317 | 3% | 19% |
| [606, 608] | 8 | 325 | 0% | 20% |
| [609, 611] | 5 | 330 | 0% | 20% |
| [612, 614] | 10 | 340 | 1% | 21% |
| [615, 617] | 8 | 348 | 0% | 21% |
| [618, 620] | 8 | 356 | 0% | 22% |
| [621, 623] | 16 | 372 | 1% | 23% |
| [624, 626] | 21 | 393 | 1% | 24% |
| [627, 629] | 45 | 438 | 3% | 27% |
| [630, 632] | 121 | 559 | 7% | 34% |
| [633, 635] | 87 | 646 | 5% | 40% |
| [636, 638] | 104 | 750 | 6% | 46% |
| [639, 641] | 179 | 929 | 11% | 57% |
| [642, 644] | 99 | 1,028 | 6% | 63% |
| [645, 647] | 99 | 1,127 | 6% | 69% |
| [648, 650] | 115 | 1,242 | 7% | 76% |
| [651, 653] | 119 | 1,361 | 7% | 83% |
| [654, 656] | 58 | 1,419 | 4% | 87% |
| [657, 659] | 46 | 1,465 | 3% | 90% |
| [660, 662] | 29 | 1,494 | 2% | 92% |
| [663, 665] | 26 | 1,520 | 2% | 93% |
| [666, 668] | 32 | 1,552 | 2% | 95% |
| [669, 671] | 23 | 1,575 | 1% | 97% |
| [672, 674] | 13 | 1,588 | 1% | 97% |
| [675, 677] | 14 | 1,602 | 1% | 98% |
| [678, 680] | 10 | 1,612 | 1% | 99% |
| [681, 683] | 0 | 1,612 | 0% | 99% |
| [684, 686] | 7 | 1,619 | 0% | 99% |
| [687, 689] | 5 | 1,624 | 0% | 100% |
| [690, 692] | 0 | 1,624 | 0% | 100% |
| [693, 695] | 0 | 1,624 | 0% | 100% |
| [696, 698] | 2 | 1,626 | 0% | 100% |
| [699, 699] | 4 | 1,630 | 0% | 100% |

Table 7.C.14 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Seven

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [700, 702] | 202 | 202 | 13% | 13% |
| [703, 705] | 74 | 276 | 5% | 18% |
| [706, 708] | 6 | 282 | 0% | 18% |
| [709, 711] | 5 | 287 | 0% | 18% |
| [712, 714] | 4 | 291 | 0% | 19% |
| [715, 717] | 7 | 298 | 0% | 19% |
| [718, 720] | 7 | 305 | 0% | 20% |
| [721, 723] | 17 | 322 | 1% | 21% |
| [724, 726] | 24 | 346 | 2% | 22% |
| [727, 729] | 35 | 381 | 2% | 24% |
| [730, 732] | 111 | 492 | 7% | 31% |
| [733, 735] | 64 | 556 | 4% | 36% |
| [736, 738] | 74 | 630 | 5% | 40% |
| [739, 741] | 168 | 798 | 11% | 51% |
| [742, 744] | 82 | 880 | 5% | 56% |
| [745, 747] | 153 | 1,033 | 10% | 66% |
| [748, 750] | 79 | 1,112 | 5% | 71% |
| [751, 753] | 82 | 1,194 | 5% | 76% |
| [754, 756] | 106 | 1,300 | 7% | 83% |
| [757, 759] | 69 | 1,369 | 4% | 88% |
| [760, 762] | 50 | 1,419 | 3% | 91% |
| [763, 765] | 32 | 1,451 | 2% | 93% |
| [766, 768] | 23 | 1,474 | 1% | 94% |
| [769, 771] | 27 | 1,501 | 2% | 96% |
| [772, 774] | 18 | 1,519 | 1% | 97% |
| [775, 777] | 15 | 1,534 | 1% | 98% |
| [778, 780] | 0 | 1,534 | 0% | 98% |
| [781, 783] | 8 | 1,542 | 1% | 99% |
| [784, 786] | 8 | 1,550 | 1% | 99% |
| [787, 789] | 0 | 1,550 | 0% | 99% |
| [790, 792] | 3 | 1,553 | 0% | 99% |
| [793, 795] | 0 | 1,553 | 0% | 99% |
| [796, 798] | 3 | 1,556 | 0% | 100% |
| [799, 799] | 6 | 1,562 | 0% | 100% |

Table 7.C.15 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Eight

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [800, 802] | 211 | 211 | 14% | 14% |
| [803, 805] | 43 | 254 | 3% | 17% |
| [806, 808] | 0 | 254 | 0% | 17% |
| [809, 811] | 4 | 258 | 0% | 17% |
| [812, 814] | 7 | 265 | 0% | 17% |
| [815, 817] | 5 | 270 | 0% | 18% |
| [818, 820] | 5 | 275 | 0% | 18% |
| [821, 823] | 29 | 304 | 2% | 20% |
| [824, 826] | 29 | 333 | 2% | 22% |
| [827, 829] | 41 | 374 | 3% | 24% |
| [830, 832] | 54 | 428 | 4% | 28% |
| [833, 835] | 146 | 574 | 10% | 38% |
| [836, 838] | 78 | 652 | 5% | 43% |
| [839, 841] | 126 | 778 | 8% | 51% |
| [842, 844] | 123 | 901 | 8% | 59% |
| [845, 847] | 65 | 966 | 4% | 63% |
| [848, 850] | 107 | 1,073 | 7% | 70% |
| [851, 853] | 75 | 1,148 | 5% | 75% |
| [854, 856] | 107 | 1,255 | 7% | 82% |
| [857, 859] | 53 | 1,308 | 3% | 86% |
| [860, 862] | 43 | 1,351 | 3% | 88% |
| [863, 865] | 36 | 1,387 | 2% | 91% |
| [866, 868] | 25 | 1,412 | 2% | 92% |
| [869, 871] | 23 | 1,435 | 2% | 94% |
| [872, 874] | 35 | 1,470 | 2% | 96% |
| [875, 877] | 17 | 1,487 | 1% | 97% |
| [878, 880] | 0 | 1,487 | 0% | 97% |
| [881, 883] | 19 | 1,506 | 1% | 99% |
| [884, 886] | 10 | 1,516 | 1% | 99% |
| [887, 889] | 0 | 1,516 | 0% | 99% |
| [890, 892] | 5 | 1,521 | 0% | 100% |
| [893, 895] | 0 | 1,521 | 0% | 100% |
| [896, 898] | 4 | 1,525 | 0% | 100% |
| [899, 899] | 2 | 1,527 | 0% | 100% |

Table 7.C.16 Frequency Distribution of Overall Scale Scores—Mathematics, Grade Eleven

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Scale Score | N | Cumulative Frequency | Percent | Cumulative Percent |
| [900, 902] | 223 | 223 | 17% | 17% |
| [903, 905] | 35 | 258 | 3% | 19% |
| [906, 908] | 4 | 262 | 0% | 20% |
| [909, 911] | 0 | 262 | 0% | 20% |
| [912, 914] | 7 | 269 | 1% | 20% |
| [915, 917] | 17 | 286 | 1% | 21% |
| [918, 920] | 19 | 305 | 1% | 23% |
| [921, 923] | 24 | 329 | 2% | 25% |
| [924, 926] | 29 | 358 | 2% | 27% |
| [927, 929] | 74 | 432 | 6% | 32% |
| [930, 932] | 99 | 531 | 7% | 40% |
| [933, 935] | 44 | 575 | 3% | 43% |
| [936, 938] | 99 | 674 | 7% | 50% |
| [939, 941] | 48 | 722 | 4% | 54% |
| [942, 944] | 102 | 824 | 8% | 62% |
| [945, 947] | 61 | 885 | 5% | 66% |
| [948, 950] | 132 | 1,017 | 10% | 76% |
| [951, 953] | 58 | 1,075 | 4% | 80% |
| [954, 956] | 63 | 1,138 | 5% | 85% |
| [957, 959] | 54 | 1,192 | 4% | 89% |
| [960, 962] | 32 | 1,224 | 2% | 92% |
| [963, 965] | 23 | 1,247 | 2% | 93% |
| [966, 968] | 29 | 1,276 | 2% | 96% |
| [969, 971] | 25 | 1,301 | 2% | 97% |
| [972, 974] | 14 | 1,315 | 1% | 98% |
| [975, 977] | 0 | 1,315 | 0% | 98% |
| [978, 980] | 6 | 1,321 | 0% | 99% |
| [981, 983] | 10 | 1,331 | 1% | 100% |
| [984, 986] | 0 | 1,331 | 0% | 100% |
| [987, 989] | 4 | 1,335 | 0% | 100% |
| [990, 992] | 0 | 1,335 | 0% | 100% |
| [993, 995] | 1 | 1,336 | 0% | 100% |
| [996, 998] | 0 | 1,336 | 0% | 100% |
| [999, 999] | 0 | 1,336 | 0% | 100% |

### Appendix 7.D: Demographic Summaries

**Notes:**

* To protect privacy when the number of students in a student group is 10 or fewer, the summary statistics at the test and reporting levels are not reported and are presented as “N/A” in the tables in [appendix 7.D](#_Appendix_7.D:_Demographic).
* Percentages in these tables may not sum up to 100 because of rounding.

Table 7.D.1 Demographic Summary—ELA, Grade Three

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,581 | 341 | 25 | 49% | 28% | 23% |
| Male | 1,111 | 341 | 26 | 49% | 28% | 23% |
| Female | 470 | 340 | 24 | 50% | 28% | 21% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 9 | N/A | N/A | N/A | N/A | N/A |
| Asian | 131 | 333 | 25 | 60% | 24% | 16% |
| Native Hawaiian or Other Pacific Islander | 3 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 33 | 335 | 26 | 58% | 27% | 15% |
| Hispanic or Latino | 816 | 342 | 24 | 47% | 31% | 23% |
| Black or African American | 95 | 340 | 24 | 49% | 33% | 18% |
| White | 391 | 340 | 27 | 51% | 24% | 25% |
| Two or more races | 103 | 340 | 26 | 52% | 23% | 24% |
| English only | 1,065 | 341 | 26 | 51% | 25% | 24% |
| IFEP | 16 | 332 | 22 | 69% | 25% | 6% |
| EL | 395 | 341 | 25 | 47% | 32% | 21% |
| RFEP | 105 | 341 | 22 | 41% | 42% | 17% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 453 | 337 | 23 | 54% | 32% | 14% |
| Hearing impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 44 | 356 | 18 | 20% | 39% | 41% |
| Visual impairment | 1 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 6 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.1 *(continuation one)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Orthopedic impairment | 29 | 335 | 27 | 59% | 21% | 21% |
| Other health impairment | 109 | 352 | 24 | 26% | 38% | 37% |
| Specific learning disability | 56 | 370 | 16 | 2% | 23% | 75% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 81 | 322 | 26 | 77% | 11% | 12% |
| Autism | 791 | 340 | 25 | 52% | 26% | 21% |
| Traumatic brain injury | 4 | N/A | N/A | N/A | N/A | N/A |
| Not economically disadvantaged | 607 | 337 | 26 | 56% | 25% | 20% |
| Economically disadvantaged | 974 | 343 | 25 | 46% | 30% | 24% |
| Migrant education | 11 | 349 | 25 | 36% | 36% | 27% |
| Not migrant education | 1,570 | 340 | 25 | 50% | 28% | 23% |
| American Indian or Alaska Native—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 72 | 331 | 25 | 68% | 17% | 15% |
| Asian—Economically disadvantaged | 59 | 336 | 25 | 51% | 32% | 17% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 22 | 336 | 27 | 50% | 32% | 18% |
| Filipino—Economically disadvantaged | 11 | 334 | 26 | 73% | 18% | 9% |
| Hispanic or Latino—Not economically disadvantaged | 216 | 339 | 25 | 52% | 28% | 20% |
| Hispanic or Latino—Economically disadvantaged | 600 | 343 | 24 | 45% | 32% | 24% |
| Black or African American—Not economically disadvantaged | 30 | 334 | 24 | 67% | 20% | 13% |
| Black or African American—Economically disadvantaged | 65 | 342 | 24 | 42% | 38% | 20% |

Table 7.D.1 *(continuation two)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| White—Not economically disadvantaged | 209 | 339 | 27 | 51% | 26% | 23% |
| White—Economically disadvantaged | 182 | 342 | 27 | 50% | 22% | 28% |
| Two or more races—Not economically disadvantaged | 55 | 334 | 26 | 64% | 18% | 18% |
| Two or more races—Economically disadvantaged | 48 | 347 | 25 | 40% | 29% | 31% |

Table 7.D.2 Demographic Summary—ELA, Grade Four

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,701 | 437 | 22 | 56% | 31% | 13% |
| Male | 1,168 | 437 | 22 | 56% | 32% | 12% |
| Female | 533 | 438 | 23 | 56% | 30% | 14% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 9 | N/A | N/A | N/A | N/A | N/A |
| Asian | 150 | 434 | 21 | 66% | 27% | 7% |
| Native Hawaiian or Other Pacific Islander | 3 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 42 | 433 | 23 | 67% | 24% | 10% |
| Hispanic or Latino | 927 | 438 | 21 | 55% | 33% | 12% |
| Black or African American | 99 | 440 | 23 | 51% | 31% | 18% |
| White | 395 | 437 | 23 | 55% | 29% | 16% |
| Two or more races | 76 | 437 | 24 | 58% | 28% | 14% |
| English only | 1,075 | 437 | 22 | 56% | 31% | 13% |
| IFEP | 17 | 432 | 21 | 71% | 24% | 6% |
| EL | 459 | 437 | 22 | 58% | 29% | 13% |
| RFEP | 149 | 440 | 20 | 52% | 35% | 13% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 545 | 437 | 20 | 59% | 32% | 9% |
| Hearing impairment | 6 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 35 | 451 | 13 | 17% | 63% | 20% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 7 | N/A | N/A | N/A | N/A | N/A |
| Orthopedic impairment | 41 | 438 | 24 | 44% | 46% | 10% |
| Other health impairment | 106 | 446 | 21 | 34% | 46% | 20% |
| Specific learning disability | 96 | 462 | 13 | 6% | 38% | 56% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 83 | 419 | 23 | 78% | 18% | 4% |
| Autism | 771 | 435 | 22 | 64% | 27% | 10% |
| Traumatic brain injury | 7 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.2 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 671 | 434 | 22 | 63% | 28% | 9% |
| Economically disadvantaged | 1,030 | 439 | 22 | 51% | 33% | 16% |
| Migrant education | 7 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,694 | 437 | 22 | 56% | 31% | 13% |
| American Indian or Alaska Native—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 86 | 433 | 21 | 69% | 27% | 5% |
| Asian—Economically disadvantaged | 64 | 435 | 22 | 63% | 28% | 9% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 28 | 428 | 21 | 75% | 21% | 4% |
| Filipino—Economically disadvantaged | 14 | 441 | 24 | 50% | 29% | 21% |
| Hispanic or Latino—Not economically disadvantaged | 262 | 435 | 21 | 62% | 30% | 8% |
| Hispanic or Latino—Economically disadvantaged | 665 | 439 | 21 | 52% | 34% | 14% |
| Black or African American—Not economically disadvantaged | 32 | 436 | 23 | 63% | 25% | 13% |
| Black or African American—Economically disadvantaged | 67 | 441 | 23 | 45% | 34% | 21% |
| White—Not economically disadvantaged | 216 | 434 | 23 | 62% | 28% | 10% |
| White—Economically disadvantaged | 179 | 441 | 24 | 47% | 30% | 22% |
| Two or more races—Not economically disadvantaged | 44 | 437 | 23 | 59% | 27% | 14% |
| Two or more races—Economically disadvantaged | 32 | 436 | 25 | 56% | 28% | 16% |

Table 7.D.3 Demographic Summary—ELA, Grade Five

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,694 | 541 | 23 | 51% | 30% | 19% |
| Male | 1,183 | 541 | 23 | 50% | 31% | 19% |
| Female | 511 | 540 | 23 | 54% | 28% | 18% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 13 | 543 | 18 | 54% | 31% | 15% |
| Asian | 131 | 537 | 21 | 60% | 28% | 12% |
| Native Hawaiian or Other Pacific Islander | 7 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 38 | 533 | 21 | 68% | 26% | 5% |
| Hispanic or Latino | 867 | 542 | 23 | 50% | 30% | 20% |
| Black or African American | 121 | 542 | 22 | 51% | 33% | 16% |
| White | 419 | 541 | 25 | 49% | 30% | 21% |
| Two or more races | 98 | 540 | 23 | 51% | 27% | 22% |
| English only | 1,113 | 540 | 23 | 53% | 29% | 18% |
| IFEP | 18 | 536 | 26 | 56% | 28% | 17% |
| EL | 382 | 543 | 23 | 47% | 31% | 22% |
| RFEP | 180 | 542 | 22 | 50% | 33% | 17% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 574 | 539 | 21 | 56% | 30% | 14% |
| Hearing impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 29 | 559 | 11 | 10% | 31% | 59% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 10 | N/A | N/A | N/A | N/A | N/A |
| Orthopedic impairment | 37 | 537 | 27 | 59% | 27% | 14% |
| Other health impairment | 93 | 554 | 20 | 27% | 34% | 39% |
| Specific learning disability | 127 | 563 | 17 | 11% | 34% | 55% |
| Deaf-blindness | 2 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 88 | 524 | 23 | 76% | 17% | 7% |
| Autism | 713 | 538 | 22 | 57% | 30% | 14% |
| Traumatic brain injury | 10 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.3 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 654 | 538 | 23 | 57% | 28% | 15% |
| Economically disadvantaged | 1,040 | 543 | 23 | 48% | 31% | 22% |
| Migrant education | 13 | 553 | 23 | 23% | 31% | 46% |
| Not migrant education | 1,681 | 541 | 23 | 51% | 30% | 19% |
| American Indian or Alaska Native—Not economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 9 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 77 | 535 | 22 | 66% | 25% | 9% |
| Asian—Economically disadvantaged | 54 | 540 | 21 | 50% | 33% | 17% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 26 | 529 | 19 | 81% | 19% | 0% |
| Filipino—Economically disadvantaged | 12 | 542 | 24 | 42% | 42% | 17% |
| Hispanic or Latino—Not economically disadvantaged | 228 | 540 | 22 | 54% | 29% | 16% |
| Hispanic or Latino—Economically disadvantaged | 639 | 543 | 23 | 49% | 30% | 21% |
| Black or African American—Not economically disadvantaged | 33 | 543 | 22 | 45% | 39% | 15% |
| Black or African American—Economically disadvantaged | 88 | 541 | 22 | 53% | 31% | 16% |
| White—Not economically disadvantaged | 228 | 538 | 24 | 54% | 30% | 16% |
| White—Economically disadvantaged | 191 | 544 | 26 | 43% | 30% | 27% |
| Two or more races—Not economically disadvantaged | 57 | 536 | 23 | 61% | 21% | 18% |
| Two or more races—Economically disadvantaged | 41 | 545 | 23 | 37% | 34% | 29% |

Table 7.D.4 Demographic Summary—ELA, Grade Six

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,653 | 642 | 21 | 45% | 41% | 15% |
| Male | 1,145 | 642 | 21 | 44% | 41% | 15% |
| Female | 508 | 641 | 21 | 45% | 40% | 15% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 18 | 644 | 22 | 33% | 44% | 22% |
| Asian | 138 | 638 | 20 | 53% | 39% | 8% |
| Native Hawaiian or Other Pacific Islander | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 41 | 640 | 18 | 39% | 56% | 5% |
| Hispanic or Latino | 877 | 642 | 20 | 44% | 41% | 15% |
| Black or African American | 105 | 642 | 20 | 44% | 43% | 13% |
| White | 385 | 641 | 22 | 44% | 39% | 17% |
| Two or more races | 83 | 644 | 21 | 43% | 37% | 19% |
| English only | 1,024 | 641 | 21 | 44% | 41% | 15% |
| IFEP | 18 | 635 | 23 | 67% | 17% | 17% |
| EL | 421 | 641 | 21 | 47% | 40% | 14% |
| RFEP | 189 | 644 | 18 | 42% | 44% | 14% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 599 | 641 | 19 | 48% | 42% | 10% |
| Hearing impairment | 10 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 17 | 653 | 15 | 18% | 53% | 29% |
| Visual impairment | 2 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 15 | 658 | 14 | 7% | 53% | 40% |
| Orthopedic impairment | 28 | 644 | 22 | 32% | 50% | 18% |
| Other health impairment | 106 | 652 | 17 | 25% | 45% | 30% |
| Specific learning disability | 123 | 659 | 13 | 10% | 41% | 49% |
| Deaf-blindness | 3 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 93 | 621 | 22 | 82% | 14% | 4% |
| Autism | 652 | 640 | 20 | 48% | 41% | 11% |
| Traumatic brain injury | 5 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.4 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 649 | 640 | 22 | 50% | 38% | 12% |
| Economically disadvantaged | 1,004 | 643 | 20 | 41% | 42% | 17% |
| Migrant education | 8 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,645 | 642 | 21 | 44% | 41% | 15% |
| American Indian or Alaska Native—Not economically disadvantaged | 3 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 15 | 648 | 17 | 27% | 53% | 20% |
| Asian—Not economically disadvantaged | 88 | 638 | 20 | 58% | 35% | 7% |
| Asian—Economically disadvantaged | 50 | 639 | 21 | 44% | 46% | 10% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 0 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 33 | 639 | 18 | 39% | 58% | 3% |
| Filipino—Economically disadvantaged | 8 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 231 | 641 | 22 | 49% | 35% | 16% |
| Hispanic or Latino—Economically disadvantaged | 646 | 642 | 20 | 42% | 43% | 15% |
| Black or African American—Not economically disadvantaged | 31 | 638 | 22 | 52% | 42% | 6% |
| Black or African American—Economically disadvantaged | 74 | 644 | 19 | 41% | 43% | 16% |
| White—Not economically disadvantaged | 216 | 639 | 22 | 50% | 38% | 13% |
| White—Economically disadvantaged | 169 | 644 | 21 | 37% | 41% | 22% |
| Two or more races—Not economically disadvantaged | 47 | 644 | 19 | 43% | 43% | 15% |
| Two or more races—Economically disadvantaged | 36 | 643 | 23 | 44% | 31% | 25% |

Table 7.D.5 Demographic Summary—ELA, Grade Seven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,582 | 742 | 21 | 42% | 38% | 20% |
| Male | 1,044 | 742 | 21 | 42% | 37% | 20% |
| Female | 538 | 742 | 21 | 42% | 39% | 19% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 12 | 745 | 26 | 33% | 33% | 33% |
| Asian | 138 | 740 | 21 | 46% | 40% | 14% |
| Native Hawaiian or Other Pacific Islander | 9 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 21 | 733 | 21 | 52% | 48% | 0% |
| Hispanic or Latino | 838 | 743 | 21 | 40% | 38% | 21% |
| Black or African American | 104 | 741 | 24 | 48% | 27% | 25% |
| White | 390 | 741 | 22 | 44% | 40% | 17% |
| Two or more races | 70 | 745 | 20 | 36% | 39% | 26% |
| English only | 966 | 742 | 22 | 42% | 38% | 19% |
| IFEP | 16 | 735 | 20 | 63% | 31% | 6% |
| EL | 367 | 743 | 20 | 42% | 36% | 22% |
| RFEP | 233 | 743 | 21 | 40% | 39% | 21% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 642 | 741 | 19 | 46% | 40% | 14% |
| Hearing impairment | 9 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 11 | 756 | 12 | 9% | 45% | 45% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 14 | 759 | 9 | 0% | 57% | 43% |
| Orthopedic impairment | 44 | 740 | 24 | 34% | 48% | 18% |
| Other health impairment | 94 | 747 | 22 | 30% | 38% | 32% |
| Specific learning disability | 119 | 758 | 14 | 15% | 30% | 55% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 91 | 730 | 24 | 67% | 20% | 13% |
| Autism | 545 | 740 | 22 | 44% | 39% | 17% |
| Traumatic brain injury | 9 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.5 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 575 | 739 | 22 | 48% | 37% | 16% |
| Economically disadvantaged | 1,007 | 744 | 21 | 39% | 39% | 22% |
| Migrant education | 9 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,573 | 742 | 21 | 42% | 38% | 20% |
| American Indian or Alaska Native—Not economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 75 | 740 | 20 | 45% | 39% | 16% |
| Asian—Economically disadvantaged | 63 | 739 | 21 | 46% | 41% | 13% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 14 | 736 | 21 | 43% | 57% | 0% |
| Filipino—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 194 | 740 | 22 | 47% | 35% | 18% |
| Hispanic or Latino—Economically disadvantaged | 644 | 744 | 20 | 38% | 39% | 22% |
| Black or African American—Not economically disadvantaged | 36 | 739 | 23 | 58% | 22% | 19% |
| Black or African American—Economically disadvantaged | 68 | 742 | 24 | 43% | 29% | 28% |
| White—Not economically disadvantaged | 208 | 737 | 22 | 50% | 38% | 13% |
| White—Economically disadvantaged | 182 | 745 | 21 | 37% | 42% | 21% |
| Two or more races—Not economically disadvantaged | 38 | 746 | 18 | 37% | 42% | 21% |
| Two or more races—Economically disadvantaged | 32 | 745 | 22 | 34% | 34% | 31% |

Table 7.D.6 Demographic Summary—ELA, Grade Eight

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,547 | 843 | 19 | 41% | 48% | 11% |
| Male | 1,058 | 843 | 19 | 40% | 49% | 11% |
| Female | 489 | 842 | 20 | 43% | 45% | 11% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 10 | N/A | N/A | N/A | N/A | N/A |
| Asian | 130 | 842 | 17 | 40% | 57% | 3% |
| Native Hawaiian or Other Pacific Islander | 7 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 39 | 843 | 19 | 46% | 41% | 13% |
| Hispanic or Latino | 823 | 843 | 20 | 40% | 48% | 11% |
| Black or African American | 91 | 843 | 18 | 42% | 48% | 10% |
| White | 381 | 843 | 19 | 41% | 47% | 12% |
| Two or more races | 66 | 845 | 19 | 41% | 38% | 21% |
| English only | 973 | 843 | 20 | 41% | 47% | 12% |
| IFEP | 9 | N/A | N/A | N/A | N/A | N/A |
| EL | 313 | 843 | 19 | 40% | 49% | 11% |
| RFEP | 251 | 843 | 19 | 41% | 50% | 8% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 625 | 842 | 19 | 44% | 47% | 8% |
| Hearing impairment | 11 | 842 | 15 | 45% | 55% | 0% |
| Speech or language impairment | 22 | 853 | 6 | 5% | 82% | 14% |
| Visual impairment | 1 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 16 | 857 | 12 | 13% | 63% | 25% |
| Orthopedic impairment | 33 | 838 | 21 | 55% | 33% | 12% |
| Other health impairment | 74 | 849 | 19 | 24% | 51% | 24% |
| Specific learning disability | 116 | 859 | 9 | 6% | 57% | 37% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 92 | 822 | 23 | 72% | 26% | 2% |
| Autism | 546 | 843 | 18 | 42% | 49% | 8% |
| Traumatic brain injury | 11 | 848 | 8 | 55% | 45% | 0% |

Table 7.D.6 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 599 | 841 | 20 | 45% | 46% | 9% |
| Economically disadvantaged | 948 | 844 | 19 | 38% | 49% | 13% |
| Migrant education | 4 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,543 | 843 | 19 | 41% | 48% | 11% |
| American Indian or Alaska Native—Not economically disadvantaged | 3 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 68 | 841 | 17 | 41% | 56% | 3% |
| Asian—Economically disadvantaged | 62 | 844 | 16 | 39% | 58% | 3% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 25 | 844 | 16 | 52% | 32% | 16% |
| Filipino—Economically disadvantaged | 14 | 841 | 24 | 36% | 57% | 7% |
| Hispanic or Latino—Not economically disadvantaged | 216 | 841 | 20 | 44% | 46% | 9% |
| Hispanic or Latino—Economically disadvantaged | 607 | 843 | 20 | 39% | 49% | 12% |
| Black or African American—Not economically disadvantaged | 30 | 840 | 19 | 63% | 27% | 10% |
| Black or African American—Economically disadvantaged | 61 | 844 | 18 | 31% | 59% | 10% |
| White—Not economically disadvantaged | 226 | 841 | 20 | 44% | 47% | 9% |
| White—Economically disadvantaged | 155 | 846 | 18 | 38% | 46% | 16% |
| Two or more races—Not economically disadvantaged | 29 | 842 | 19 | 48% | 38% | 14% |
| Two or more races—Economically disadvantaged | 37 | 847 | 19 | 35% | 38% | 27% |

Table 7.D.7 Demographic Summary—ELA, Grade Eleven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,360 | 943 | 21 | 39% | 45% | 16% |
| Male | 925 | 942 | 21 | 40% | 43% | 17% |
| Female | 435 | 943 | 21 | 37% | 48% | 15% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 11 | 943 | 16 | 55% | 36% | 9% |
| Asian | 86 | 939 | 23 | 48% | 40% | 13% |
| Native Hawaiian or Other Pacific Islander | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 31 | 944 | 19 | 39% | 48% | 13% |
| Hispanic or Latino | 749 | 944 | 21 | 37% | 47% | 16% |
| Black or African American | 84 | 943 | 20 | 39% | 44% | 17% |
| White | 355 | 942 | 22 | 41% | 43% | 17% |
| Two or more races | 38 | 941 | 22 | 47% | 34% | 18% |
| English only | 803 | 942 | 22 | 40% | 43% | 17% |
| IFEP | 15 | 931 | 27 | 60% | 27% | 13% |
| EL | 267 | 942 | 21 | 40% | 49% | 12% |
| RFEP | 275 | 946 | 19 | 33% | 47% | 20% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 590 | 943 | 19 | 40% | 48% | 12% |
| Hearing impairment | 8 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Visual impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 11 | 962 | 12 | 0% | 55% | 45% |
| Orthopedic impairment | 34 | 938 | 24 | 47% | 38% | 15% |
| Other health impairment | 63 | 951 | 17 | 22% | 51% | 27% |
| Specific learning disability | 115 | 957 | 9 | 8% | 58% | 34% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 87 | 919 | 23 | 79% | 16% | 5% |
| Autism | 434 | 942 | 21 | 40% | 43% | 17% |
| Traumatic brain injury | 4 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.7 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 550 | 939 | 23 | 48% | 38% | 14% |
| Economically disadvantaged | 810 | 945 | 20 | 33% | 49% | 18% |
| Migrant education | 5 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,355 | 943 | 21 | 39% | 45% | 16% |
| American Indian or Alaska Native—Not economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 50 | 938 | 23 | 52% | 34% | 14% |
| Asian—Economically disadvantaged | 36 | 941 | 22 | 42% | 47% | 11% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 21 | 942 | 21 | 52% | 29% | 19% |
| Filipino—Economically disadvantaged | 10 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 203 | 938 | 23 | 49% | 39% | 12% |
| Hispanic or Latino—Economically disadvantaged | 546 | 946 | 19 | 32% | 49% | 18% |
| Black or African American—Not economically disadvantaged | 30 | 942 | 18 | 47% | 37% | 17% |
| Black or African American—Economically disadvantaged | 54 | 943 | 21 | 35% | 48% | 17% |
| White—Not economically disadvantaged | 220 | 939 | 23 | 47% | 37% | 16% |
| White—Economically disadvantaged | 135 | 946 | 20 | 30% | 51% | 19% |
| Two or more races—Not economically disadvantaged | 18 | 937 | 25 | 44% | 50% | 6% |
| Two or more races—Economically disadvantaged | 20 | 944 | 19 | 50% | 20% | 30% |

Table 7.D.8 Demographic Summary—Mathematics, Grade Three

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,561 | 332 | 21 | 70% | 24% | 6% |
| Male | 1,097 | 333 | 22 | 69% | 25% | 6% |
| Female | 464 | 332 | 20 | 73% | 22% | 5% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 9 | N/A | N/A | N/A | N/A | N/A |
| Asian | 127 | 329 | 22 | 78% | 17% | 5% |
| Native Hawaiian or Other Pacific Islander | 3 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 32 | 328 | 22 | 84% | 9% | 6% |
| Hispanic or Latino | 812 | 333 | 21 | 69% | 25% | 5% |
| Black or African American | 91 | 331 | 20 | 77% | 19% | 4% |
| White | 386 | 332 | 23 | 68% | 25% | 8% |
| Two or more races | 101 | 331 | 23 | 69% | 22% | 9% |
| English only | 1,048 | 332 | 22 | 69% | 24% | 7% |
| IFEP | 15 | 322 | 18 | 87% | 13% | 0% |
| EL | 394 | 333 | 21 | 71% | 24% | 5% |
| RFEP | 104 | 333 | 19 | 71% | 27% | 2% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 449 | 329 | 20 | 78% | 19% | 2% |
| Hearing impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 44 | 342 | 15 | 52% | 41% | 7% |
| Visual impairment | 1 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 6 | N/A | N/A | N/A | N/A | N/A |
| Orthopedic impairment | 29 | 327 | 21 | 69% | 31% | 0% |
| Other health impairment | 105 | 341 | 19 | 55% | 33% | 11% |
| Specific learning disability | 56 | 354 | 15 | 30% | 43% | 27% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 81 | 316 | 22 | 89% | 7% | 4% |
| Autism | 779 | 332 | 21 | 70% | 24% | 6% |
| Traumatic brain injury | 4 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.8 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 601 | 329 | 22 | 73% | 21% | 6% |
| Economically disadvantaged | 960 | 334 | 21 | 68% | 26% | 6% |
| Migrant education | 12 | 338 | 21 | 75% | 17% | 8% |
| Not migrant education | 1,549 | 332 | 21 | 70% | 24% | 6% |
| American Indian or Alaska Native—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 73 | 327 | 23 | 81% | 14% | 5% |
| Asian—Economically disadvantaged | 54 | 331 | 21 | 74% | 22% | 4% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 22 | 327 | 23 | 86% | 5% | 9% |
| Filipino—Economically disadvantaged | 10 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 214 | 331 | 21 | 71% | 23% | 5% |
| Hispanic or Latino—Economically disadvantaged | 598 | 334 | 20 | 69% | 26% | 5% |
| Black or African American—Not economically disadvantaged | 29 | 325 | 20 | 86% | 14% | 0% |
| Black or African American—Economically disadvantaged | 62 | 333 | 20 | 73% | 21% | 6% |
| White—Not economically disadvantaged | 205 | 330 | 23 | 69% | 23% | 7% |
| White—Economically disadvantaged | 181 | 334 | 22 | 66% | 26% | 8% |
| Two or more races—Not economically disadvantaged | 55 | 325 | 23 | 76% | 16% | 7% |
| Two or more races—Economically disadvantaged | 46 | 337 | 22 | 61% | 28% | 11% |

Table 7.D.9 Demographic Summary—Mathematics, Grade Four

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,685 | 432 | 21 | 68% | 26% | 6% |
| Male | 1,158 | 433 | 20 | 68% | 26% | 6% |
| Female | 527 | 432 | 21 | 69% | 25% | 6% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 9 | N/A | N/A | N/A | N/A | N/A |
| Asian | 150 | 432 | 21 | 70% | 25% | 5% |
| Native Hawaiian or Other Pacific Islander | 3 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 41 | 431 | 21 | 59% | 39% | 2% |
| Hispanic or Latino | 913 | 432 | 20 | 71% | 24% | 5% |
| Black or African American | 96 | 435 | 21 | 58% | 34% | 7% |
| White | 398 | 433 | 22 | 66% | 28% | 7% |
| Two or more races | 75 | 431 | 21 | 71% | 21% | 8% |
| English only | 1,072 | 433 | 21 | 66% | 28% | 6% |
| IFEP | 17 | 429 | 26 | 82% | 6% | 12% |
| EL | 447 | 431 | 20 | 75% | 20% | 6% |
| RFEP | 148 | 435 | 20 | 64% | 31% | 5% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 537 | 430 | 19 | 77% | 20% | 4% |
| Hearing impairment | 6 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 36 | 445 | 15 | 50% | 36% | 14% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 7 | N/A | N/A | N/A | N/A | N/A |
| Orthopedic impairment | 41 | 430 | 19 | 76% | 24% | 0% |
| Other health impairment | 104 | 438 | 19 | 58% | 37% | 6% |
| Specific learning disability | 96 | 452 | 11 | 24% | 57% | 19% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 82 | 415 | 19 | 90% | 9% | 1% |
| Autism | 765 | 432 | 21 | 68% | 26% | 6% |
| Traumatic brain injury | 7 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.9 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 673 | 430 | 21 | 73% | 21% | 6% |
| Economically disadvantaged | 1,012 | 434 | 20 | 66% | 29% | 6% |
| Migrant education | 7 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,678 | 432 | 21 | 68% | 26% | 6% |
| American Indian or Alaska Native—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 87 | 430 | 21 | 70% | 26% | 3% |
| Asian—Economically disadvantaged | 63 | 434 | 21 | 70% | 22% | 8% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 27 | 429 | 20 | 59% | 41% | 0% |
| Filipino—Economically disadvantaged | 14 | 434 | 22 | 57% | 36% | 7% |
| Hispanic or Latino—Not economically disadvantaged | 263 | 431 | 21 | 73% | 21% | 6% |
| Hispanic or Latino—Economically disadvantaged | 650 | 433 | 20 | 70% | 25% | 5% |
| Black or African American—Not economically disadvantaged | 31 | 430 | 22 | 68% | 26% | 6% |
| Black or African American—Economically disadvantaged | 65 | 437 | 20 | 54% | 38% | 8% |
| White—Not economically disadvantaged | 219 | 430 | 21 | 74% | 19% | 6% |
| White—Economically disadvantaged | 179 | 436 | 22 | 55% | 38% | 7% |
| Two or more races—Not economically disadvantaged | 43 | 430 | 21 | 77% | 12% | 12% |
| Two or more races—Economically disadvantaged | 32 | 431 | 21 | 63% | 34% | 3% |

Table 7.D.10 Demographic Summary—Mathematics, Grade Five

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,672 | 535 | 20 | 66% | 29% | 5% |
| Male | 1,162 | 536 | 20 | 64% | 30% | 6% |
| Female | 510 | 532 | 20 | 70% | 26% | 4% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 11 | 537 | 19 | 64% | 36% | 0% |
| Asian | 129 | 534 | 20 | 65% | 29% | 6% |
| Native Hawaiian or Other Pacific Islander | 7 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 40 | 531 | 21 | 73% | 20% | 8% |
| Hispanic or Latino | 851 | 535 | 19 | 66% | 29% | 5% |
| Black or African American | 121 | 535 | 20 | 64% | 31% | 4% |
| White | 414 | 535 | 21 | 65% | 29% | 6% |
| Two or more races | 99 | 532 | 21 | 73% | 22% | 5% |
| English only | 1,101 | 534 | 20 | 66% | 29% | 5% |
| IFEP | 18 | 529 | 25 | 78% | 6% | 17% |
| EL | 378 | 535 | 20 | 66% | 29% | 6% |
| RFEP | 174 | 536 | 18 | 67% | 28% | 5% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 565 | 533 | 19 | 71% | 26% | 3% |
| Hearing impairment | 6 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 29 | 549 | 14 | 38% | 45% | 17% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 10 | N/A | N/A | N/A | N/A | N/A |
| Orthopedic impairment | 37 | 530 | 23 | 73% | 22% | 5% |
| Other health impairment | 92 | 544 | 17 | 49% | 42% | 9% |
| Specific learning disability | 126 | 549 | 11 | 36% | 52% | 12% |
| Deaf-blindness | 2 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 87 | 520 | 22 | 80% | 17% | 2% |
| Autism | 704 | 533 | 20 | 68% | 26% | 5% |
| Traumatic brain injury | 10 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.10 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 650 | 533 | 21 | 68% | 26% | 6% |
| Economically disadvantaged | 1,022 | 535 | 20 | 65% | 31% | 5% |
| Migrant education | 12 | 543 | 17 | 50% | 42% | 8% |
| Not migrant education | 1,660 | 535 | 20 | 66% | 29% | 5% |
| American Indian or Alaska Native—Not economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 76 | 534 | 21 | 66% | 25% | 9% |
| Asian—Economically disadvantaged | 53 | 535 | 18 | 64% | 34% | 2% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 1 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 28 | 528 | 21 | 75% | 21% | 4% |
| Filipino—Economically disadvantaged | 12 | 538 | 21 | 67% | 17% | 17% |
| Hispanic or Latino—Not economically disadvantaged | 224 | 534 | 19 | 68% | 27% | 5% |
| Hispanic or Latino—Economically disadvantaged | 627 | 535 | 19 | 65% | 30% | 5% |
| Black or African American—Not economically disadvantaged | 33 | 537 | 18 | 58% | 39% | 3% |
| Black or African American—Economically disadvantaged | 88 | 535 | 21 | 67% | 28% | 5% |
| White—Not economically disadvantaged | 227 | 533 | 22 | 67% | 26% | 7% |
| White—Economically disadvantaged | 187 | 537 | 20 | 62% | 32% | 6% |
| Two or more races—Not economically disadvantaged | 57 | 531 | 21 | 75% | 18% | 7% |
| Two or more races—Economically disadvantaged | 42 | 533 | 20 | 69% | 29% | 2% |

Table 7.D.11 Demographic Summary—Mathematics, Grade Six

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,630 | 636 | 21 | 63% | 27% | 10% |
| Male | 1,130 | 637 | 21 | 62% | 27% | 11% |
| Female | 500 | 635 | 21 | 65% | 27% | 9% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 17 | 641 | 24 | 53% | 24% | 24% |
| Asian | 136 | 634 | 23 | 68% | 17% | 15% |
| Native Hawaiian or Other Pacific Islander | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 41 | 637 | 20 | 63% | 32% | 5% |
| Hispanic or Latino | 862 | 636 | 21 | 63% | 28% | 9% |
| Black or African American | 103 | 640 | 20 | 57% | 30% | 13% |
| White | 382 | 635 | 22 | 63% | 26% | 10% |
| Two or more races | 83 | 636 | 23 | 64% | 25% | 11% |
| English only | 1,013 | 636 | 22 | 63% | 27% | 11% |
| IFEP | 17 | 626 | 21 | 88% | 0% | 12% |
| EL | 413 | 635 | 22 | 65% | 26% | 10% |
| RFEP | 186 | 638 | 19 | 60% | 31% | 9% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 588 | 635 | 20 | 65% | 28% | 7% |
| Hearing impairment | 10 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 18 | 651 | 17 | 33% | 44% | 22% |
| Visual impairment | 2 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 15 | 644 | 26 | 40% | 33% | 27% |
| Orthopedic impairment | 28 | 639 | 22 | 64% | 18% | 18% |
| Other health impairment | 106 | 643 | 18 | 47% | 38% | 15% |
| Specific learning disability | 122 | 651 | 14 | 37% | 40% | 23% |
| Deaf-blindness | 3 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 94 | 615 | 20 | 88% | 11% | 1% |
| Autism | 639 | 635 | 21 | 67% | 23% | 10% |
| Traumatic brain injury | 5 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.11 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 644 | 634 | 22 | 66% | 25% | 10% |
| Economically disadvantaged | 986 | 637 | 21 | 61% | 28% | 10% |
| Migrant education | 8 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,622 | 636 | 21 | 63% | 27% | 10% |
| American Indian or Alaska Native—Not economically disadvantaged | 3 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 14 | 645 | 19 | 50% | 29% | 21% |
| Asian—Not economically disadvantaged | 87 | 633 | 24 | 67% | 16% | 17% |
| Asian—Economically disadvantaged | 49 | 634 | 21 | 69% | 18% | 12% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 0 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 33 | 637 | 21 | 67% | 27% | 6% |
| Filipino—Economically disadvantaged | 8 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 228 | 635 | 21 | 62% | 29% | 9% |
| Hispanic or Latino—Economically disadvantaged | 634 | 636 | 20 | 63% | 28% | 9% |
| Black or African American—Not economically disadvantaged | 31 | 634 | 23 | 65% | 26% | 10% |
| Black or African American—Economically disadvantaged | 72 | 642 | 19 | 54% | 32% | 14% |
| White—Not economically disadvantaged | 213 | 634 | 22 | 69% | 23% | 8% |
| White—Economically disadvantaged | 169 | 638 | 22 | 56% | 31% | 14% |
| Two or more races—Not economically disadvantaged | 49 | 636 | 25 | 65% | 22% | 12% |
| Two or more races—Economically disadvantaged | 34 | 637 | 22 | 62% | 29% | 9% |

Table 7.D.12 Demographic Summary—Mathematics, Grade Seven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,562 | 738 | 22 | 56% | 31% | 12% |
| Male | 1,030 | 738 | 22 | 56% | 31% | 13% |
| Female | 532 | 738 | 21 | 57% | 32% | 11% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 11 | 744 | 20 | 36% | 36% | 27% |
| Asian | 138 | 735 | 22 | 59% | 33% | 9% |
| Native Hawaiian or Other Pacific Islander | 9 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 21 | 727 | 20 | 76% | 19% | 5% |
| Hispanic or Latino | 830 | 739 | 21 | 57% | 31% | 12% |
| Black or African American | 103 | 739 | 22 | 56% | 25% | 18% |
| White | 382 | 737 | 22 | 55% | 33% | 12% |
| Two or more races | 68 | 743 | 20 | 49% | 35% | 16% |
| English only | 954 | 738 | 22 | 57% | 30% | 13% |
| IFEP | 14 | 725 | 25 | 71% | 21% | 7% |
| EL | 361 | 739 | 20 | 55% | 34% | 11% |
| RFEP | 233 | 739 | 22 | 55% | 32% | 12% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 633 | 737 | 20 | 61% | 28% | 10% |
| Hearing impairment | 9 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 11 | 751 | 11 | 18% | 64% | 18% |
| Visual impairment | 4 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 14 | 753 | 12 | 36% | 36% | 29% |
| Orthopedic impairment | 43 | 734 | 25 | 60% | 28% | 12% |
| Other health impairment | 91 | 745 | 22 | 35% | 43% | 22% |
| Specific learning disability | 116 | 753 | 15 | 26% | 50% | 24% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 91 | 725 | 24 | 76% | 21% | 3% |
| Autism | 541 | 737 | 22 | 58% | 30% | 12% |
| Traumatic brain injury | 9 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.12 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 569 | 736 | 23 | 60% | 28% | 12% |
| Economically disadvantaged | 993 | 740 | 21 | 54% | 33% | 12% |
| Migrant education | 9 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,553 | 738 | 22 | 56% | 31% | 12% |
| American Indian or Alaska Native—Not economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 76 | 736 | 22 | 62% | 29% | 9% |
| Asian—Economically disadvantaged | 62 | 735 | 22 | 55% | 37% | 8% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 14 | 732 | 20 | 71% | 21% | 7% |
| Filipino—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 190 | 737 | 23 | 60% | 27% | 13% |
| Hispanic or Latino—Economically disadvantaged | 640 | 740 | 21 | 56% | 33% | 12% |
| Black or African American—Not economically disadvantaged | 35 | 737 | 26 | 60% | 17% | 23% |
| Black or African American—Economically disadvantaged | 68 | 741 | 20 | 54% | 29% | 16% |
| White—Not economically disadvantaged | 207 | 734 | 22 | 61% | 30% | 9% |
| White—Economically disadvantaged | 175 | 741 | 21 | 49% | 36% | 15% |
| Two or more races—Not economically disadvantaged | 37 | 743 | 19 | 49% | 32% | 19% |
| Two or more races—Economically disadvantaged | 31 | 743 | 22 | 48% | 39% | 13% |

Table 7.D.13 Demographic Summary—Mathematics, Grade Eight

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,527 | 839 | 22 | 59% | 27% | 14% |
| Male | 1,044 | 840 | 22 | 58% | 27% | 15% |
| Female | 483 | 837 | 22 | 61% | 27% | 13% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 10 | N/A | N/A | N/A | N/A | N/A |
| Asian | 129 | 839 | 23 | 57% | 27% | 16% |
| Native Hawaiian or Other Pacific Islander | 7 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 39 | 840 | 22 | 59% | 28% | 13% |
| Hispanic or Latino | 813 | 838 | 22 | 60% | 27% | 14% |
| Black or African American | 89 | 839 | 19 | 66% | 22% | 11% |
| White | 373 | 840 | 22 | 58% | 25% | 16% |
| Two or more races | 67 | 841 | 22 | 49% | 36% | 15% |
| English only | 962 | 839 | 22 | 59% | 27% | 14% |
| IFEP | 9 | N/A | N/A | N/A | N/A | N/A |
| EL | 308 | 839 | 22 | 59% | 25% | 16% |
| RFEP | 247 | 840 | 22 | 58% | 27% | 15% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 1 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 622 | 837 | 21 | 65% | 24% | 11% |
| Hearing impairment | 10 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 22 | 851 | 13 | 41% | 36% | 23% |
| Visual impairment | 1 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 16 | 853 | 16 | 38% | 31% | 31% |
| Orthopedic impairment | 32 | 833 | 24 | 66% | 22% | 13% |
| Other health impairment | 75 | 848 | 20 | 37% | 41% | 21% |
| Specific learning disability | 114 | 858 | 15 | 17% | 46% | 37% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 87 | 818 | 21 | 89% | 9% | 2% |
| Autism | 537 | 839 | 22 | 60% | 26% | 13% |
| Traumatic brain injury | 11 | 845 | 15 | 55% | 18% | 27% |

Table 7.D.13 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 591 | 837 | 22 | 62% | 26% | 12% |
| Economically disadvantaged | 936 | 840 | 22 | 57% | 27% | 16% |
| Migrant education | 4 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,523 | 839 | 22 | 59% | 27% | 14% |
| American Indian or Alaska Native—Not economically disadvantaged | 3 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 7 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 68 | 838 | 23 | 62% | 22% | 16% |
| Asian—Economically disadvantaged | 61 | 840 | 23 | 51% | 33% | 16% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 25 | 841 | 21 | 60% | 28% | 12% |
| Filipino—Economically disadvantaged | 14 | 838 | 24 | 57% | 29% | 14% |
| Hispanic or Latino—Not economically disadvantaged | 212 | 836 | 22 | 61% | 27% | 12% |
| Hispanic or Latino—Economically disadvantaged | 601 | 839 | 22 | 59% | 27% | 14% |
| Black or African American—Not economically disadvantaged | 30 | 834 | 19 | 77% | 17% | 7% |
| Black or African American—Economically disadvantaged | 59 | 841 | 19 | 61% | 25% | 14% |
| White—Not economically disadvantaged | 221 | 837 | 21 | 63% | 25% | 11% |
| White—Economically disadvantaged | 152 | 845 | 22 | 51% | 25% | 24% |
| Two or more races—Not economically disadvantaged | 30 | 841 | 22 | 43% | 47% | 10% |
| Two or more races—Economically disadvantaged | 37 | 841 | 23 | 54% | 27% | 19% |

Table 7.D.14 Demographic Summary—Mathematics, Grade Eleven

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| All Valid Scores | 1,336 | 936 | 22 | 62% | 28% | 11% |
| Male | 907 | 936 | 22 | 60% | 28% | 11% |
| Female | 429 | 935 | 21 | 65% | 26% | 9% |
| Nonbinary | 0 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native | 11 | 926 | 17 | 82% | 18% | 0% |
| Asian | 82 | 935 | 24 | 65% | 22% | 13% |
| Native Hawaiian or Other Pacific Islander | 6 | N/A | N/A | N/A | N/A | N/A |
| Filipino | 31 | 938 | 21 | 65% | 19% | 16% |
| Hispanic or Latino | 741 | 936 | 21 | 61% | 29% | 10% |
| Black or African American | 81 | 934 | 19 | 65% | 28% | 6% |
| White | 346 | 935 | 23 | 62% | 26% | 13% |
| Two or more races | 38 | 934 | 20 | 58% | 34% | 8% |
| English only | 785 | 935 | 22 | 62% | 26% | 11% |
| IFEP | 15 | 923 | 21 | 87% | 7% | 7% |
| EL | 266 | 936 | 22 | 62% | 28% | 10% |
| RFEP | 270 | 938 | 19 | 58% | 32% | 10% |
| ADEL | 0 | N/A | N/A | N/A | N/A | N/A |
| To be determined | 0 | N/A | N/A | N/A | N/A | N/A |
| English proficiency unknown | 0 | N/A | N/A | N/A | N/A | N/A |
| Intellectual disability | 584 | 934 | 19 | 69% | 26% | 5% |
| Hearing impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Speech or language impairment | 6 | N/A | N/A | N/A | N/A | N/A |
| Visual impairment | 7 | N/A | N/A | N/A | N/A | N/A |
| Emotional disturbance | 11 | 953 | 13 | 27% | 45% | 27% |
| Orthopedic impairment | 33 | 928 | 23 | 67% | 30% | 3% |
| Other health impairment | 61 | 944 | 21 | 46% | 36% | 18% |
| Specific learning disability | 113 | 953 | 14 | 27% | 44% | 29% |
| Deaf-blindness | 0 | N/A | N/A | N/A | N/A | N/A |
| Multiple disabilities | 83 | 913 | 19 | 90% | 7% | 2% |
| Autism | 427 | 937 | 22 | 59% | 27% | 14% |
| Traumatic brain injury | 4 | N/A | N/A | N/A | N/A | N/A |

Table 7.D.14 *(continuation)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Student Group | Number Tested | Mean Scale Score | SD of Scale Scores | Percent in Achievement Level 1—Alternate | Percent in Achievement Level 2—Alternate | Percent in Achievement Level 3—Alternate |
| Not economically disadvantaged | 538 | 932 | 23 | 68% | 22% | 10% |
| Economically disadvantaged | 798 | 938 | 20 | 57% | 32% | 11% |
| Migrant education | 5 | N/A | N/A | N/A | N/A | N/A |
| Not migrant education | 1,331 | 936 | 22 | 62% | 27% | 11% |
| American Indian or Alaska Native—Not economically disadvantaged | 6 | N/A | N/A | N/A | N/A | N/A |
| American Indian or Alaska Native—Economically disadvantaged | 5 | N/A | N/A | N/A | N/A | N/A |
| Asian—Not economically disadvantaged | 47 | 934 | 26 | 64% | 17% | 19% |
| Asian—Economically disadvantaged | 35 | 935 | 22 | 66% | 29% | 6% |
| Native Hawaiian or Other Pacific Islander—Not economically disadvantaged | 2 | N/A | N/A | N/A | N/A | N/A |
| Native Hawaiian or Other Pacific Islander—Economically disadvantaged | 4 | N/A | N/A | N/A | N/A | N/A |
| Filipino—Not economically disadvantaged | 21 | 938 | 22 | 67% | 19% | 14% |
| Filipino—Economically disadvantaged | 10 | N/A | N/A | N/A | N/A | N/A |
| Hispanic or Latino—Not economically disadvantaged | 200 | 932 | 22 | 71% | 21% | 9% |
| Hispanic or Latino—Economically disadvantaged | 541 | 938 | 20 | 57% | 33% | 10% |
| Black or African American—Not economically disadvantaged | 30 | 932 | 18 | 70% | 27% | 3% |
| Black or African American—Economically disadvantaged | 51 | 936 | 19 | 63% | 29% | 8% |
| White—Not economically disadvantaged | 215 | 932 | 24 | 67% | 23% | 10% |
| White—Economically disadvantaged | 131 | 940 | 22 | 53% | 31% | 17% |
| Two or more races—Not economically disadvantaged | 17 | 930 | 22 | 65% | 29% | 6% |
| Two or more races—Economically disadvantaged | 21 | 937 | 17 | 52% | 38% | 10% |

## Psychometric Analyses

This chapter contains the item- and test-level statistics from the analyses typically conducted for the California Alternate Assessments (CAAs) for English language arts/‌literacy (ELA) and mathematics administered during the California Assessment of Student Performance and Progress (CAASPP) administration.

Because of the impact of the novel coronavirus disease 2019 (COVID-19) pandemic, less than half of the students registered were administered the CAAs for ELA and mathematics during the 2020–‍2021 CAASPP administration. Performing psychometric analyses based on a small sample may potentially bias the results of such analyses; therefore, none of the analyses were conducted during the 2020–‍2021 administration.

Because the 2020–2021 CAA operational items were identical to the 2018–2019 CAA operational items, the item- and test-level statistics from the analyses conducted during the 2018–2019 CAASPP administration could be used to construct the raw-to-scale score conversion tables for the 2020–2021 administration. As a result, every raw-to-scale score conversion table across all CAAs for ELA and mathematics constructed during the 2020–‍2021 administration is identical to those constructed during the 2018–2019 administration. Refer to the *California Alternate Assessments for English Language Arts/Literacy and Mathematics 2018–2019 Technical Report* (California Department of Education [CDE], 2020) for the results of the psychometric analyses conducted during the 2018–2019 administration.

### Overview

This section describes the data samples used for the statistical analyses and provides explanations for all statistical procedures implemented in the psychometric analyses during a typical administration. Those procedures include item analyses, differential item functioning (DIF) analyses, item response theory (IRT) calibration, equating and scaling, and computation of reliability, standard errors of measurement, and decision consistency and accuracy of the achievement-level classifications. The procedures designed to ensure the validity of score uses and interpretations also are provided.

#### Summary of the Analyses

The following list presents the analyses typically conducted for the CAAs for ELA and mathematics. However, these analyses were not conducted in 2020–2021 because of the impacts of the COVID-19 pandemic. Each analysis is described in the text subsequently.

1. **Classical Item Analyses—**Classical item analysis for the CAAs for ELA and mathematics is discussed in section [*8.2 Classical Item Analysis*](#_Classical_Item_Analysis).
2. **IRT Analyses—**IRT analyses, including calibration, equating, and scaling for the CAAs for ELA and mathematics are elaborated in section [*8.3 Item Response Theory Analyses*](#_Item_Response_Theory_1).
3. **Omission and Completion Analyses—**The omit rate and item difficulty information for the CAAs for ELA and mathematics are presented in section [*8.4 Omission and Completion Rates*](#_Omission_and_Completion)*8.4 Omission and Completion Rates*. These analyses examine whether the items with high omit rates are systematically more difficult than items with low omit rates.
4. **DIF Analyses—**DIF analysis for the CAAs for ELA and mathematics is described in section [*8.5 Differential Item Functioning Analyses*](#_Differential_Item_Functioning).
5. **Reliability Analyses—**Reliability estimation for the CAAs for ELA and mathematics is illustrated in section [*8.6 Reliability Analyses*](#_Reliability_Analyses).
6. **Validity Evidence—**Validity evidence related to the CAAs for ELA and mathematics is discussed in section [*8.7 Validity Evidence*](#_Validity_Evidence).

#### Sample Used for the Analyses

In general, analyses included in the technical report are based on all students in the tested population with valid scores available at the time of analysis. The actual data sample used depends on when that data source becomes available as well as the information contained in the data to meet the analysis timeline. However, in the 2020–2021 administration, the data sample included an insufficient number of students tested to conduct the psychometric analyses.

### Classical Item Analysis

No classical item analyses were conducted for the 2020–2021 CAAs for ELA and mathematics administration because of an insufficient number of students tested during the administration. This section describes the classical item analysis procedures typically conducted for a standard test administration.

Classical item analyses are typically conducted to evaluate the performance of all operational test items with respect to item difficulty, item discrimination, and student performance on the key-based, selected-response (SR) items and the rubric-based, constructed-response (CR) items. Because of the nature of the multistage test (MST) design, routing rules presented the items in each Stage 2 module to a group of students instead of to all students. The combination of Stage 1 and Stage 2 modules produced two linear test forms. Pathways of these forms are provided in table 4.2.

#### Description of Classical Item Analysis Statistics

The classical item analyses include the computation of item difficulty indices and the item-total correlation indices. Flagging rules based on these statistics identify items not performing as expected. The omit rate of each item, the proportion of test takers choosing each distractor, the correlation of each distractor with the total score, and the distribution of each score point for the polytomous items are also included in the classical item analyses.

Some classical item analyses, such as item-total correlation and DIF analysis, require a criterion variable—typically, the total raw score. However, using the total raw score as a criterion variable for the CAAs for ELA and mathematics is not appropriate because of the MST design, in which different students took different combinations of modules. To circumvent these issues and provide the best available criterion score, a linearly transformed scale score based on theta score is used as the criterion score. Refer to section [*8.3 Item Response Theory Analyses*](#_Item_Response_Theory_1)*,* which provides a description of the methods used to compute theta scores.

However, the transformed scale score is not available for use as a criterion score during the preliminary item analysis (PIA), which is conducted to actively monitor item performance as the test administration proceeds. During the PIA, a total raw score is used as the criterion score, and some adjustments are made to account for the MST design. If an item appears in Stage 1, item response data from all pathways are combined as part of the item analysis and the total raw score across the 10 Stage 1 operational items serves as the criterion score. But, if an item appears in Stage 2, only item response data from the pathway the item was assigned was used, and the total raw score across all 25 operational items (10 Stage 1 operational items plus 15 Stage 2 items on the respective module) across the two stages serves as the criterion score. Hence, items duplicated across Stage 2 modules are reported separately by module.

For item analyses conducted after test administration and transforming the theta scores to scale scores, the scale score can be used as the criterion score. For instance, the final item analysis uses the transformed scale score as the criterion score and both pathways are combined for item analyses. Unlike for the PIA, the duplicated Stage 2 items are not considered separately.

##### Classical Item Difficulty Indices (*p*-value and Average Item Score)

For dichotomous items, item difficulty is indicated by the *p*-value, which is the proportion of students who answer an item correctly. The range of possible *p*-values is from 0.00 to 1.00. Items with higher *p*-values are easier items; those with lower *p*-values are more difficult items. For the 2018–2019 administration, dichotomous items were flagged for review if their *p*-values were above 0.95 (i.e., too easy) or below 0.33 (i.e., too difficult). Had there been a sufficient number of students tested to have conducted classical item analyses for the 2020–2021 CAAs for ELA and mathematics administration, the 2020–2021 administration would use different flagging criteria. Dichotomous items are now flagged for review if their *p*-values are above 0.95. Dichotomous items with two response choices are flagged for review if their *p‑*values are below 0.50, three-choice items are flagged if their *p*-values are below 0.30, and four-choice items are flagged if their *p*-values are below 0.20 (i.e., too difficult).

The formula for *p*-value for a dichotomous item is presented in equation 8.1. *Refer to the* [*Alternative Text for Equation 8.1*](#_Alternative_Text_for) *for a description of this equation.*

, (8.1)

where,

*Xij* is the score received for a given dichotomous item *i* for student *j*, and

*Ni* is the total number of students who were presented with item *i*.

For polytomous items, difficulty is indicated by the average item score (AIS). The AIS can range from 0.00 to the maximum total possible points for an item. Desired AIS values for polytomous items generally fall within the range of 30 percent to 80 percent of the maximum obtainable item score; items with values outside this range are flagged for review. To facilitate interpretation, the AIS values for polytomous items are often expressed as the proportion of the maximum possible score, which is analogous to the *p-*values of dichotomous items.

For polytomous items, the *p-value* is defined as presented in equation 8.2. *Refer to the* [*Alternative Text for Equation 8.2*](#_Alternative_Text_for_7) *for a description of this equation.*

 (8.2)

where,

*Xij* is the score received for a given polytomous item *i* for student *j*,

*Ni* is the total number of students who were presented with item *i*, and

*Max (Xi)* is the maximum score for item *i*.

##### Item-Total Correlation

Item-total correlation describes the relationship between students’ performance on a specific item and their performance on the total assessment. It is calculated as the correlation coefficient between the item score and total score.

In general, the item-total correlation ranges from -1.0 (for a perfect negative relationship) to 1.0 (for a perfect positive relationship). A relatively high positive item-total correlation is desired, as it indicates that students with higher scores on the assessment tend to perform better on the item than students with lower scores. A negative item-total correlation, which indicates that students with low scores on the assessment are more likely to get higher scores on the item than students with high scores on the assessment, typically signifies a problem with the item.

Because the product-moment correlation is limited by the distributions of the variables being correlated, the item discrimination index used in these analyses is a variation of the biserial correlation (for dichotomous items) or the polyserial correlation (for polytomous items). This statistic is an estimate of the correlation between the criterion and an unobservable continuous variable assumed to determine performance on the item. The criterion—in this case, either the student’s total raw score or the student’s transformed scale score—is the ability value for which the expected total score is equal to the student’s total score.

The estimation formula is presented in equation 8.3. *Refer to the* [*Alternative Text for Equation 8.3*](#_Alternative_Text_for_8) *for a description of this equation.*

 (8.3)

where,

 is the estimated slope of the regression of the unobservable continuous variable (assumed to account for the item response) on the criterion, and

*Stot* is the standard deviation of the criterion (for example, the students’ transformed scale scores).

For a polytomous item, there is a regression for each boundary between item scores, with all regressions for the same item sharing a common slope, *β*. For a polytomous item with *k* possible score values, there are *k-*1 regressions. Beta (*β*) is the common slope for all *k*-1 regressions.

Desired values for this correlation coefficient are positive and larger than 0.20. Negative item-total correlations indicate that low-ability students tend to obtain higher scores on the item than high-ability students, an indication that the scoring key may be incorrect, or the item did not function as intended for the students taking the CAA. Items with item-total correlations below 0.20 were flagged for review.

Note that “not presented” items are treated as blank in the response data file.

##### Distribution of Item Scores

For polytomous items, examination of the distribution of scores helps to show how well the items performed. If no students receive the highest possible score, the item may not be functioning as expected. The item may be confusing, poorly worded, or just unexpectedly difficult; the scoring rubric may be flawed; or students may not have had an opportunity to learn the content tested by the item. If all or most students score at the extreme ends of the distribution—students receive either full credit or zero credit, but no partial credit—there may be problems with the item or the rubric.

Items with a low percentage (i.e., less than 3 percent) of students obtaining any possible item score are flagged for further review. Such items may pose problems during the IRT calibrations. They need to be carefully reviewed and may need to be excluded from the item calibration analyses.

#### Summary of Typical Classical Item Analysis Flagging Criteria

Items are flagged for review if the item analysis yields any of the seven following results:

1. The *p-*value is above 0.95 for dichotomous items or above 0.80 for polytomous items.
2. For the 2018–2019 administration, the *p-*value was below 0.33 for dichotomous items or below 0.30 for polytomous items. As of the 2020–2021 administration, the *p*-value is below 0.50 for two-choice dichotomous items, 0.30 for three-choice dichotomous items, 0.20 for four-choice dichotomous items, or 0.30 for polytomous items.
3. Item-total correlation (r-polyserial) is below 0.20.
4. Among the highest-performing students (the top 20 percent), the number of students choosing any distractor is greater than the number of those choosing the key.
5. The omit rate is above 5 percent for dichotomous items or above 15 percent for polytomous items.
6. The percentage of students receiving a score category is below 3 percent for polytomous items.
7. Any distractor shows a positive correlation (either point-biserial, r-biserial, or polyserial) with the criterion score.

In a typical administration, ETS’ Psychometric Analysis & Research staff and Assessment and Learning Technology Research & Development (ALTRD) staff carefully review each of the flagged items and summarize the results for the CDE, with recommendations for subsequent analyses. The classical item statistics are also entered into the item bank and used by the ALTRD team for test assembly for future operational administrations.

### Item Response Theory Analyses

IRT is built upon the item response function, which describes the probability of a given response as a function of a person’s true ability. IRT can be used to implement item calibrations, link item parameters, scale test scores across different forms or test administrations, evaluate item performance, build an item bank, and assemble test forms.

The 2020–2021 CAAs for ELA and mathematics were preequated to the baseline scale by reusing the equating of the 2018–2019 CAAs to the same baseline scale. This section describes how IRT models were used in the 2018–2019 CAA tests for calibrating items, linking item parameters onto the reference scale (i.e., the 2015–2016 baseline scale), and scaling the test scores from different forms onto a common scale so that they can be compared. IRT data file preparation and IRT models are also described in this section.

#### Models

The one-parameter logistic (1PL) item response theory (1PL-IRT) model was used for the CAAs for ELA and mathematics item calibration and was selected after consultation with the CDE. In particular, the generalized partial credit model (GPCM) (Muraki, 1992) restricted for 1PL‑IRT, which is essentially the partial credit model (PCM) (Masters, 1982), was applied to both dichotomous and polytomous items.

The mathematical form of the GPCM is presented in equation 8.4. *Refer to the* [*Alternative Text for Equation 8.4*](#_Alternative_Text_for_9) *for a description of this equation.*

 (8.4)

where,

*Pih(θj)* is the probability of student with proficiency *θj* obtaining score *h* on item *i*,

*ni* is the maximum number of score points for item *i*,

*ai* is the discrimination parameter and is fixed to 0.588 for every item,

*bi* is the location (difficulty) parameter for item *i*,

*div* is the category (difficulty) parameter for item *i* on item score *v*, and

*D* is a scaling constant of 1.7 that makes the logistic model approximate the normal ogive model.

When *ni* = 1, equation 8.4 becomes an expression of the 1PL model for dichotomous items. Essentially, the 1PL model (Hambleton, Swaminathan, & Rogers, 1991) and the PCM (Masters, 1982) were used for dichotomous items and polytomous items, respectively.

#### Equating

Equating is a procedure where test scores from different test forms that are assembled based on the same specifications are placed onto the reference scale so that scores from different test administrations are comparable. The 2020–2021 CAAs for ELA and mathematics in grades three through eight and grade eleven were preequated to the baseline scale established for each assessment in the 2015–2016 administration by reusing the equating of the 2018–2019 CAAs for ELA and mathematics in grades three through eight and grade eleven to the same baseline scale using a common-item nonequivalent group design (Kolen & Brennan, 2004).

The raw-to-scale score conversion tables established by the equating of the 2018–2019 CAAs to the 2015–2016 baseline scale were reused during the 2020–2021 administration to transform each tested student’s raw score to a scale score. The equating procedure described in this subsection was conducted during the 2018–2019 administration and had three steps: item calibration, linking, and scaling.

##### Calibration

After the 2018–2019 CAA administration, all the items within each test (grade and content area) were calibrated concurrently, using all available data. Previous studies show that compared with separate calibration, concurrent calibration is more accurate when the data fits the IRT model (Kim & Cohen, 1998; Hanson & Béguin, 2002). After consultation with the CDE and its CAASPP Technical Advisory Group, a single-group concurrent calibration approach was used for item calibration of the CAAs for ELA and mathematics.

The 10 operational items in the router at Stage 1, together with some overlapping items between the pathways, served as common items between the pathways for the concurrent calibration. The nonanchor operational items in the two Stage 2 modules, as well as the embedded field test items, were calibrated onto the existing IRT scale in this concurrent calibration. Refer to [*4.2.2. English Language Arts/Literacy and Mathematics Test Design*](#_English_Language_Arts/Literacy) in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for the distributions of these items in modules. As stated in subsection [*8.3.1 Models*](#_Item_Response_Theory_2)*,* the 1PL model and the corresponding PCM were jointly used to concurrently calibrate dichotomously and polytomously scored items*.* The software flexMIRT® (Cai, 2017) version 3.51 was used for calibration.

###### Data Preparation

Prior to IRT calibration analyses, ETS psychometricians reviewed the results of the classical item analyses to decide whether any items were of poor quality and needed to be removed from calibration. The results were also reviewed by ETS content experts and the CDE. The decision to remove items from calibration was made in consultation with the CDE. For the 2018–2019 administration of the CAAs for ELA and mathematics, no items were excluded from the calibration analyses.

For IRT calibration, scored item response data was used to create the IRT analysis input data files for each grade and content area, including responses to items at both Stage 1 and Stage 2. For each possible form (i.e., pathway), there were 29 items in total, with 14 items from Stage 1 and 15 items from Stage 2. The IRT analysis input data file is a sparse matrix, because each student completed only one of the three possible forms (refer to table 4.2 for the list of forms). Similar to the classical item analyses, “omit” items were treated as incorrect and “not-presented” items were treated as blank.

###### Description of the Calibration Procedure

FlexMIRT (Cai, 2017), a multilevel and multiple-group IRT software package for item analysis and test scoring, was used for CAA item calibration analysis. This software can fit a variety of IRT models to both single-level and multilevel data that are dichotomous, polytomous, or both, and was chosen for its superior flexibility among IRT software programs.

The evaluation of the calibration results includes the following steps:

1. Reviewing the item parameter estimates to examine whether these estimates were reasonable:
2. At the form level, the summary statistics for the *b*-parameter estimates (location difficulty) and *d*-parameter estimates (step difficulty) were examined, including the mean, standard deviation, median, minimum, maximum, and goodness-of-fit.
3. At the item level, statistics of individual items were examined, including item difficulty estimates, model-fit statistics, and the IRT-based item parameters.
4. Flagging items that did not perform as expected (All flagged items were discussed thoroughly with the CDE to decide whether those items should be removed from calibration or whether the scoring categories need to be collapsed.)

As a result of consultation with the CDE, no items used during the 2018–2019 CAA administration were removed from the analysis and no categories were collapsed.

The calibration process was paralleled by two ETS psychometricians to ensure quality and accuracy of results. Specifically, two psychometricians independently created flexMIRT control files and ran the same input data files and then compared the calibration results. Any differences in the output were investigated. Refer to section [*9.4 Quality Control of Scoring*](#_Quality_Control_of)for more details of this procedure.

##### Linking the Item Parameters

The new items in the 2018–2019 CAA tests for grades three through eight and grade eleven were linked to a calibrated item pool using a common-item nonequivalent groups design (Kolen & Brennan, 2004). The “base” or “reference” scales for the CAA were established based on the data from the 2015–2016 administration. The 2018–2019 items were placed on the reference 2015–2016 scale by using a set of linking items (i.e., anchor set) for each grade level, selected from the 2015–2016, 2016–2017, and 2017–2018 calibrated item pool, and readministered in 2018–2019.

After IRT calibration was performed with the 2018–2019 items, the complete set of anchor items was used to calculate the linking constants to place the 2018–2019 item parameters onto the 2015–2016 scale by using the mean-to-mean method described in the next subsection. The linking process was carried out iteratively by inspecting differences between the transformed new and reference estimates for the anchor items and by removing items for which the item difficulty estimates changed significantly; this is called the robust-z procedure. Robust-z is also described in more detail in a subsequent subsection.

###### Mean-to-Mean Transformation

The item difficulty estimates from the 2018–2019 calibration may not be comparable to those from the 2015–2016 calibration. The 2018–2019 difficulty estimates need to be transformed onto the reference scale to make them comparable to the item bank parameters. The item bank parameters were either calibrated in 2015–2016 or calibrated in 2016–2017 or 2017–‍2018 and then linked back to the 2015–2016 scale. If an anchor item was used in more than one administration, then the more recent parameter estimates for that item were used as the item bank parameters.

The mean-to-mean transformation assumes that the item bank and the 2018–2019 difficulty values differ by a constant; that is, the item bank and 2018–2019 difficulty values can be made comparable by adding the same constant for all items. If this assumption is correct, then that constant is the difference between the means of the item bank and 2018–2019 difficulty values for the anchor items.

An iterative procedure was implemented to calculate the linking constants using common items across the 2015–2016, 2016–2017, and 2017–2018 administrations and the 2018–2019 administration. For each iteration of linking constants computation, the procedure described in subsection [*8.3.2.1.2 Robust-Z Procedure*](#_8.3.2.2.2._Robust-Z_Procedure)is intended to inspect the differences between the transformed new (2018–2019) and reference estimates (2015–‍2016, 2016–2017, or 2017–2018) for the anchor items and remove anchor items for which the item difficulty estimates changed significantly.

There were eight steps involved in making the mean-to-mean transformation:

1. Identify the anchor items in both the item bank (2015–2016, 2016–2017, or 2017–‍2018 administration) and the 2018–2019 administration.
2. Obtain the item difficulty parameters (*b*-values) of these anchor items from the item bank, which are on the reference scale.
3. Obtain the item difficulty parameters (*b*-values) of these anchor items from the calibration of the 2018–2019 administration.
4. Calculate the average item difficulty for the anchor set on the reference scale from the *b*-values in the item bank.
5. Calculate the average item difficulty for the anchor set from the calibration based on data from the 2018–2019 administration.
6. Obtain the transformation constant by taking the difference between the two average item difficulties calculated in steps 4 and 5. This difference is the linking constant.
7. Obtain a set of adjusted item difficulty parameters (*b*-values) for the anchor items by applying the linking constant to the values from the 2018–2019 calibration.
8. Remove anchor items according to the procedure described in subsection [*8.3.2.1.2 Robust-Z Procedure*](#_8.3.2.2.2._Robust-Z_Procedure). For the first iteration, the anchor set includes all anchor items, while for the following iterations, the anchor set includes the remaining anchor items after removing unstable anchors one by one.

Table 8.1 shows a summary of the procedure described previously, which includes the number of all anchor items at the beginning, the number of anchor items that are removed as a result of mean-to-mean transformation and robust-z procedure, the number of remaining anchor items, and the linking constants of the final iteration of each test when the procedure was performed using student data from the 2018–2019 administration.

Table 8.1 Final Linking Summary for 2018–2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Items in Initial Anchor Set | Number of Items Removed from the Anchor Set | Number of Items in Final Linking Set | Linking Constant |
| ELA 3 | 30 | 2 | 28 | 0.1197 |
| ELA 4 | 29 | 9 | 20 | 0.0985 |
| ELA 5 | 26 | 2 | 24 | 0.1452 |
| ELA 6 | 29 | 2 | 27 | 0.1785 |
| ELA 7 | 36 | 17 | 19 | 0.1711 |
| ELA 8 | 35 | 0 | 35 | 0.0651 |
| ELA 11 | 31 | 2 | 29 | 0.1734 |
| Mathematics 3 | 32 | 14 | 18 | 0.0758 |
| Mathematics 4 | 34 | 5 | 29 | 0.0299 |
| Mathematics 5 | 31 | 3 | 28 | 0.0588 |
| Mathematics 6 | 33 | 8 | 25 | 0.0668 |
| Mathematics 7 | 26 | 4 | 22 | 0.1940 |
| Mathematics 8 | 28 | 6 | 22 | 0.1345 |
| Mathematics 11 | 29 | 13 | 16 | 0.0617 |

Table 8.2 presents the summary statistics of the final 2018–2019 equating and linking results after items with unstable parameters are detected and removed from the anchor set. The statistics provide the number of remaining items in the final anchor set, average item difficulty of the anchor set both in the item bank and from the 2018–2019 administration, along with their differences, as well as the criteria for evaluating the differences. With the exception of mathematics in grade seven, the difference of average *b*-parameters for each of the remaining 13 assessments meets the criteria. For mathematics grade seven (which is indicated with an asterisk [\*] and bolding in the table), the difference of average *b*‑parameters is -0.12, the absolute value of which is only slightly greater than the criterion value of 0.1.

Table 8.2 Linked Item Parameter Results for 2018–2019

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | N Anchor Items | Item Bank Baseline Scale Average *b*-‍parameter | Linked 2018–‍2019 Average *b*-‍parameter | Difference of Average *b*-‍parameters | Criteria for the Acceptable Absolute Difference |
| ELA 3 | 28 | -0.58 | -0.58 | 0.00 | < 0.1 |
| ELA 4 | 20 | -0.36 | 0.37 | 0.00 | < 0.1 |
| ELA 5 | 24 | -0.47 | -0.51 | 0.04 | < 0.1 |
| ELA 6 | 27 | -0.45 | -0.44 | -0.01 | < 0.1 |
| ELA 7 | 19 | -0.18 | -0.23 | 0.05 | < 0.1 |
| ELA 8 | 35 | -0.29 | -0.29 | 0.01 | < 0.1 |
| ELA 11 | 29 | -0.19 | -0.21 | 0.03 | < 0.1 |
| Mathematics 3 | 18 | 0.18 | 0.17 | 0.01 | < 0.1 |
| Mathematics 4 | 29 | -0.01 | -0.01 | 0.00 | < 0.1 |
| Mathematics 5 | 28 | 0.14 | 0.15 | -0.01 | < 0.1 |
| Mathematics 6 | 25 | 0.25 | 0.19 | 0.07 | < 0.1 |
| **\*Mathematics 7** | **22** | **0.07** | **0.19** | **-0.12** | **< 0.1** |
| Mathematics 8 | 22 | 0.07 | 0.09 | -0.02 | < 0.1 |
| Mathematics 11 | 16 | -0.03 | 0.03 | -0.06 | < 0.1 |

###### Robust-Z Procedure

To identify any unstable anchor items, ETS utilized an outlier detection procedure based on the robust-z statistic (Huynh, 2000; Huynh & Rawls, 2009). In this application, robust-z, as described in equation 8.5, was calculated based on the distribution of the difficulty difference for the anchor items between the item bank and the 2018–2019 administration. *Refer to the* [*Alternative Text for Equation 8.5*](#_Alternative_Text_for_10) *for a description of this equation.*

 (8.5)

where,

*D* is the difference between the reference and transformed new item difficulty of an anchor item,

*Md*D is the median of a distribution of *D* for all anchor items, and

*IQR* is the interquartile range of a distribution of *D* for all anchor items, which is defined as the difference between the third quartile (Q3) and the first quartile (Q1) when all the *D* values are rank-ordered. *IQR* times 0.74 approximates the standard deviation statistic and is more robust to nonnormality.

A large value of this statistic for any anchor item indicates that the item bank difficulty parameter and the linked 2018–2019 difficulty parameter for that item differed substantially.

The criterion used for removing anchor items is a robust-z value greater than 1.645. One anchor item was removed at each iteration. The following criteria were evaluated at each iteration:

* The correlation between the item bank and 2018–2019 difficulty estimates for the anchor sets after removing items flagged in the robust-z procedure should be no less than .95.
* The ratio of standard deviations (RSD) of the item bank and 2018–2019 difficulty estimates for the remaining anchor items should be between .95 and 1.1.

After each iteration, the mean difficulty difference of the anchor sets between the item bank and the 2018–2019 administrations was recomputed based on the remaining anchor items. Once the final anchor item set was obtained, ETS discussed its psychometric characteristics with the CDE and received approval from the CDE. Removed anchor items were not used in the computation of the linking constants but were still included in calibration and deriving raw-to-theta conversions.

##### Scaling the Scores

The number-correct scores (raw scores) on each new form were transformed to scale scores on the reference scale (i.e., the 2015–2016 baseline scale) using a three-step procedure. First, the new item-difficulty estimates for each test were transformed to the reference year scale, as described in subsection [*8.3.2.1.1 Mean-to-Mean Transformation*](#_Mean-to-Mean_Transformation). Then, the new form number-correct scores (raw scores) were transformed to ability (theta) scores on the reference scale by the inverse test characteristic curve (TCC) procedure described in the next subsection, 8.3.2.3.1. Finally, these ability (theta) scores were transformed to scale scores through the linear transformation described in subsection [8.3.2.3.2](#S83232). The requirements that were particularly applied to the CAA reporting scale are also listed in subsection [8.3.2.3.2](#S83232).

###### Inverse Test Characteristic Curve Procedure

After all the item difficulty estimates were transformed to the reference scale derived from the 2015–2016 administration, students’ overall ability estimates can be derived from the input data file that was described in subsection [*8.3.2.1.1 Data Preparation*](#_Data_Preparation)*,* through the IRT inverse TCC method (Stocking, 1996). This method transforms the sum of the student’s item scores into an ability estimate. That estimate is the ability value that makes the sum of the expected scores on the items administered to the student equal to the sum of the scores that the student actually received on those items.

The TCC expresses the expected total score on a set of items as a function of the student’s ability, which is shown in equation 8.6. *Refer to the* [*Alternative Text for Equation 8.6*](#_Alternative_Text_for_11) *for a description of this equation.*

 (8.6)

where,

*ndich* is the number of dichotomous items in the test,

*Pi(θ)* is the probability of a correct response to item *i* at ability *θ* on the dichotomous item in equation 8.4,

*npoly* is the number of polytomous items in the test,

*m* is the number of score categories for each polytomous item,

*sxj* is the value for score category x for the polytomous item *j*,

*Pxj(θ)* is the probability that an examinee with ability *θ* obtains score sx on the polytomous item *j* in equation 8.4, and

*ξ(θ)* is the corresponding expected total score.

###### Transformation from Theta Scores to Scale Scores

Students’ ability estimates (theta scores) were transformed to the scale score metric by applying a linear transformation based on threshold theta values. Those threshold values were determined after standard setting and approved by the California State Board of Education (SBE). Table 6.2 and table 6.3 show the standard setting threshold scores. There were two threshold theta values (for Level 2 and Level 3), for each content area (ELA or mathematics) at each grade level. The scaling transformation was the linear transformation that transformed the Level 2 threshold to scale score 45 and the Level 3 threshold to scale score 60 (refer to equations 8.7, 8.8, and 8.9). *Refer to the* [*Alternative Text for Equation 8.7*](#_Alternative_Text_for_27) *for a description of equation 8.7.*

 (8.7)

where,

 represents student ability.

The slope and intercept are calculated in equations 8.8 and 8.9 for the Level 2—Alternate and Level 3—Alternate thresholds that were set as 45 and 60, respectively. *Refer to the* [*Alternative Text for Equation 8.8*](#_Alternative_Text_for_12) *for a description of equation 8.8.*

 (8.8)

*Refer to the* [*Alternative Text for Equation 8.9*](#_Alternative_Text_for_13) *for a description of equation 8.9.*

 (8.9)

where,

 represents the threshold score for Level 3—Alternate on the theta scale, and

 represents the threshold score for Level 2—Alternate on the theta scale.

The slopes and intercepts for each grade and content area are shown in table 8.3. Also refer to subsection [*7.1.3 Scale Scores for the Total Assessment*](#_Scale_Scores_for)for the special requirements for the CAA reporting scale.

Table 8.3 Slopes and Intercepts That Convert Theta Scores to Reporting Scale Scores

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Threshold Theta Score for Level 2—Alternate | Threshold Theta Score for Level 3—Alternate | Reporting Scale Score for Level 2—Alternate | Reporting Scale Score for Level 3—Alternate | Slope | Intercept |
| ELA 3 | -0.2 | 0.8 | 45 | 60 | 15.00 | 48.0 |
| ELA 4 | 0.0 | 1.0 | 45 | 60 | 15.00 | 45.0 |
| ELA 5 | 0.0 | 1.0 | 45 | 60 | 15.00 | 45.0 |
| ELA 6 | 0.0 | 1.2 | 45 | 60 | 12.50 | 45.0 |
| ELA 7 | 0.0 | 1.0 | 45 | 60 | 15.00 | 45.0 |
| ELA 8 | -0.2 | 1.0 | 45 | 60 | 12.50 | 47.5 |
| ELA 11 | -0.2 | 1.0 | 45 | 60 | 12.50 | 47.5 |
| Mathematics 3 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 4 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 5 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 6 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 7 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 8 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |
| Mathematics 11 | 0.2 | 1.0 | 45 | 60 | 18.75 | 41.3 |

The 2020–2021 student ability estimates that were derived from the IRT models using the linked item parameters were converted to the established score scales using the procedures and conversion constants described previously. The scale scores can be found through the raw-to-scale score conversion tables presented in table 7.B.1 through table 7.B.14 in [appendix 7.B](#_Appendix_7.B:_Raw).

#### Summary of Linked Item Response Theory *b*-parameters

Once the 2018–2019 IRT *b*-parameters were placed on the 2015–2016 baseline scale for CAAs at all grade levels for ELA and mathematics, analyses were performed to assess the overall test difficulty and the distribution of item difficulty.

The overall summary of the linked IRT *b*-value estimates for 2018–2019 CAAs for ELA and mathematics calibration is shown in table 8.4. The mean, standard deviation (SD), minimum, and maximum values are presented, in addition to the number of items for each test.

Table 8.4 IRT Linked Parameter Estimates for All ELA and Mathematics Items for 2018–‍2019

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Items | Average of *b*‑value | SD *b*‑value | Minimum *b*‑value | Maximum *b*-value |
| ELA 3 | 60 | -0.72 | 0.78 | -2.25 | 1.38 |
| ELA 4 | 57 | -0.65 | 0.81 | -2.46 | 1.32 |
| ELA 5 | 57 | -0.75 | 0.79 | -2.19 | 1.45 |
| ELA 6 | 58 | -0.69 | 0.81 | -2.32 | 1.61 |
| ELA 7 | 60 | -0.43 | 0.80 | -1.80 | 2.24 |
| ELA 8 | 59 | -0.48 | 0.77 | -1.72 | 1.38 |
| ELA 11 | 58 | -0.60 | 0.74 | -1.88 | 1.33 |
| Mathematics 3 | 55 | 0.11 | 0.73 | -1.42 | 1.45 |
| Mathematics 4 | 58 | -0.09 | 0.75 | -1.70 | 1.58 |
| Mathematics 5 | 56 | 0.27 | 0.90 | -1.58 | 2.68 |
| Mathematics 6 | 58 | 0.13 | 0.72 | -1.21 | 2.14 |
| Mathematics 7 | 58 | 0.06 | 0.76 | -1.65 | 2.25 |
| Mathematics 8 | 56 | -0.01 | 0.76 | -1.65 | 1.53 |
| Mathematics 11 | 57 | -0.07 | 0.76 | -1.87 | 1.99 |

#### Evaluation of Equating

As described in subsection [*8.3.2 Equating*](#_Equating), calibrations for the 2018–2019 CAAs for ELA and mathematics were linked to the reference scale of 2015–2016 through mean-to-mean transformation. As mentioned previously, two indices were used for the CAAs to evaluate the quality of such linking procedures: the RSD of the two sets of item difficulty estimates for the anchor items (i.e., the 2015–2016 and 2018–2019 estimates), and the correlation (CORR) between the two sets of item difficulty estimates for the anchor items (Huynh & Rawls, 2009). If the CORR is at least 0.95 and the RSD is between 0.9 and 1.1, the linking results are considered acceptable, and all anchor items are regarded as stable in the linking process.

Table 8.5 presents the total number of operational items, the number of remaining anchor items after robust-z evaluation, the percentage of remaining anchor items out of all the operational items, the correlation between the final set of the transformed new (2018–2019) and reference (2015–2016) difficulty estimates for the anchor items, and the RSD between the final set of the transformed new (2018–2019) and reference (2015–2016) item parameters for anchor items based on analyses using student data from the 2018–2019 administration.

Table 8.5 Evaluation of Anchor Set (Common Items) Between the Item Bank and 2018–‍2019

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Content Area and Grade Level | Number of Unique Operational Items | Anchor Items Remaining After Deletions | Remaining Anchor Items as Percentage of All Operational Items | Correlation Between Item Bank Item Parameters and 2018–2019 Item Parameters | RSD of Item Parameters Between Item Bank and 2018–‍2019 Administration |
| ELA 3 | 40 | 28 | 70% | 0.9694 | 0.9348 |
| ELA 4 | 37 | 20 | 54% | 0.9903 | 1.0294 |
| ELA 5 | 37 | 24 | 65% | 0.9837 | 1.0203 |
| ELA 6 | 38 | 27 | 71% | 0.9693 | 1.0403 |
| ELA 7 | 40 | 19 | 48% | 0.9947 | 1.0115 |
| ELA 8 | 39 | 35 | 90% | 0.9855 | 1.0226 |
| ELA 11 | 38 | 29 | 76% | 0.9656 | 1.0073 |
| Mathematics 3 | 35 | 18 | 51% | 0.9966 | 0.9862 |
| Mathematics 4 | 38 | 29 | 76% | 0.9790 | 0.9275 |
| Mathematics 5 | 36 | 28 | 78% | 0.9927 | 1.0111 |
| Mathematics 6 | 38 | 25 | 66% | 0.9962 | 1.0006 |
| Mathematics 7 | 38 | 22 | 58% | 0.9790 | 1.0209 |
| Mathematics 8 | 36 | 22 | 61% | 0.9922 | 0.9290 |
| Mathematics 11 | 37 | 16 | 43% | 0.9962 | 0.9717 |

Anchor items account for at least 40 percent of the total number of items, which is well above the minimum requirement of 20 percent (Kolen & Brennan, 2004). For some assessments, the percentage of anchor items is greater than 70 percent. The two sets of item parameters for anchor items are highly correlated, with the lowest correlation exceeding 0.96. RSD values range from approximately 0.93 to 1.04. As both CORR and RSD values meet the criteria proposed by Huynh and Rawlings (2009), it is concluded that the linking results are acceptable.

### Omission and Completion Rates

Analyses on omission and completion rates were not conducted for the 2020–2021 CAAs for ELA and mathematics administration. This section details the analyses conducted typically for each administration.

#### Omit Rates

For both dichotomous and polytomous items, examining item omission and completion is useful for identifying potential problems with test features such as testing time and item or test layout. Typically, given that students have an adequate amount of testing time, approximately 95 percent of students should attempt to answer each question on the test. Two types of missing responses are possible for the CAAs for ELA and mathematics:

1. **An item is considered “omit”:** An item has been presented but has not been answered (i.e., left blank) in the middle of an administered assessment wherein the student has viewed and responded to successive items.
2. **An item is considered “not presented” or “omitted-by-design”:** A set of items are not presented to the student. For example, students may experience significant cognitive challenges on the Stage 1 items and be exited from the test at the end of Stage 1 without moving on to Stage 2. For these early exit cases, all items in Stage 2 are “not presented” and treated as incorrect when calculating an overall score.

After a typical test administration, each item’s omit rate is examined alongside its IRT item difficulty, and the items with high omit rates are flagged. Omit rates for polytomous items tend to be higher than for dichotomous items. Overall, the omit rate for flagging individual items is 5 percent for SR items and 15 percent for CR items. An omit response is scored as zero and included in the N-count for that item (i.e., the number of students who answered the item) when calculating item statistics. A response that is considered omit-by-design is not scored or included in the N-count for the item.

#### Completion Rates

Completion rates indicate the proportion of students who complete a certain number of items on the test. A student’s record for the test is not considered complete unless the student answered at least four items.

### Differential Item Functioning Analyses

DIF analyses were not conducted for the 2020–2021 CAAs for ELA and mathematics administration. This section details the DIF analyses conducted typically for each administration.

In a typical CAAs for ELA and mathematics administration, DIF analyses are conducted for CAA items with sufficient sample sizes. The minimum sample size requirements for the DIF analyses are 400 in the combined focal and reference groups and 100 in the smaller of the two groups. These sample sizes are based on standard operating procedures for DIF analysis at ETS.

If an item performs differentially across identifiable student groups (e.g., gender or ethnicity) when students are matched on ability, then the item may be measuring something else other than the intended construct (i.e., possible evidence of bias). It is important, however, to recognize that item performance differences flagged for DIF might be related to actual differences in relevant knowledge or skills between student groups (i.e., impact) or statistical Type I error, which might falsely find DIF in an item. As a result, DIF analysis is used mainly as a statistical tool to identify *potential* item bias. Subsequent reviews by content experts and bias and sensitivity experts are required to determine the source and meaning of performance differences.

#### Differential Item Functioning Procedure for Dichotomous Items

The Mantel-Haenszel (MH) DIF statistic is calculated for dichotomous items (Mantel & Haenszel, 1959; Holland & Thayer, 1985). Using the IRT theta score as the criterion score, students in each theta score category in the focal group (e.g., females) are compared with students in the same theta score category in the reference group (e.g., males). The common odds ratio is estimated across all categories of matched student ability using the formula in equation 8.10 (Dorans & Holland, 1993). The resulting estimate is interpreted as the relative likelihood of success on a particular item for members of two groups matched on ability. *Refer to the* [*Alternative Text for Equation 8.10*](#_Alternative_Text_for_14) *for a description of this equation.*

Equation 8.10; a link to the long description for this equation is found in the preceding paragraph. (8.10)

where,

*m* indexes the score categories,

*Rrm* is the number of students in the reference group who answer the item correctly,

*Wfm* is the number of students in the focal group who answer the item incorrectly,

*Ntm* is the total number of students,

*Rfm* is the number of students in the focal group who answer the item correctly, and

*Wrm* is the number of students in the reference group who answer the item incorrectly.

To facilitate the interpretation of MH results, the common odds ratio is frequently transformed to the delta scale using equation 8.11 (Holland & Thayer, 1985). *Refer to the [Alternative Text for Equation 8.11](#_Alternative_Text_for_15) for a description of this equation.*

 (8.11)

Positive values indicate DIF in favor of the focal group (i.e., positive DIF items are differentially easier for the focal group) whereas negative values indicate DIF in favor of the reference group (i.e., negative DIF items are differentially easier for the reference group).

#### Differential Item Functioning Procedure for Polytomous Items

The standardization DIF (Dorans & Schmitt, 1993; Zwick, Thayer, & Mazzeo, 1997; Dorans, 2013) is used in conjunction with the Mantel chi-square statistic (Mantel, 1963; Mantel & Haenszel, 1959) to identify polytomous items with DIF; the former measures the size of the DIF while the latter indicates the significance level of the DIF. The standardized mean difference (SMD) compares the item means of the two groups after adjusting for differences in the distribution of students across the values of the matching variable and is calculated using equation 8.12. *Refer to the* [*Alternative Text for Equation 8.12*](#_Alternative_Text_for_16) *for a description of this equation.*

 (8.12)

where,

*X is* the criterion score,

*Y is* the item score,

*M is* the number of score categories on *X*,

*Nfm* is the number of students in the focal group in score category *m*,

*Er* is the expected item score for the reference group, and

*Ef* is the expected item score for the focal group.

These statistics are indicators of the degree to which members of one group perform better or worse than expected on each polytomous item.

A positive SMDvalue means that, conditional on the criterion score, the focal group has a higher mean item score than the reference group (i.e., the item is differentially easier for the focal group). In contrast, a negative SMD value means that, conditional on the criterion score, the focal group has a lower mean item score than the reference group (i.e., the item is differentially harder for the focal group).

#### Classification

Based on the DIF statistics and significance tests, items are classified into three categories: A, B, or C (Holland & Wainer, 1993). Category A items contain negligible DIF, Category B items exhibit slight to moderate DIF, and Category C items possess moderate to large DIF values.

The categorization rules for dichotomous items are presented in table 8.6; the categorization rules for polytomous items are provided in table 8.7.

Table 8.6 DIF Categories for Dichotomous Items

|  |  |
| --- | --- |
| DIF Category | Criteria |
| A (negligible) | * Absolute value of MH D-DIF is not significantly different from zero or is less than one. * Positive values are classified as “A+” and negative values as “A-.” |
| B (moderate) | * Absolute value of MH D-DIF is significantly different from zero but not from one and is at least one; or absolute value of MH D-DIF is significantly different from one but is less than 1.5. * Positive values are classified as “B+” and negative values as “B-.” |
| C (large) | * Absolute value of MH D-DIF is significantly different from one and is at least 1.5. * Positive values are classified as “C+” and negative values as “C-.” |

Table 8.7 DIF Categories for Polytomous Items

|  |  |
| --- | --- |
| DIF Category | Criteria |
| A (negligible) | * Mantel Chi-square *p*-*value* ≥ 0.05 or |SMD/SD| ≤ 0.17 |
| B (moderate) | * Mantel Chi-square *p*-*value* < 0.05 and 0.17< |SMD/SD| ≤ 0.25 |
| C (large) | * Mantel Chi-square *p*-*value* < 0.05 and |SMD/SD| > 0.25 |

**Note:** SD = total group standard deviation of item score.

After a typical test administration, DIF analyses are conducted on each test for designated comparison groups on the basis of demographic variables, including gender, race or ethnicity, and primary disability, if the number of students in the group is sufficient. These comparison groups are specified in table 8.8.

Table 8.8 Student Groups for DIF Comparison

|  |  |  |
| --- | --- | --- |
| DIF Type | Reference Group | Focal Group |
| **Gender** | Male | * Female |
| **Race or Ethnicity** | White | * American Indian or Alaska Native * Asian * Black or African American * Filipino * Hispanic or Latino * Native Hawaiian or Other Pacific Islander * Two or more races |
| **Disability** | Intellectual Disability | * Autism * Deaf-blindness * Emotional disturbance * Hearing impairment * Multiple disabilities * Orthopedic impairment * Other health impairment * Specific learning disability * Speech or language impairment * Traumatic brain injury * Visual impairment |

### Reliability Analyses

Reliability analyses were not conducted for the 2020–2021 CAAs for ELA and mathematics administration. This section describes the reliability analyses conducted typically for each administration.

Reliability is the extent to which differences in test scores reflect true differences in the knowledge, ability, or skill being tested, rather than fluctuations due to measurement error. Thus, reliability is the consistency of scores across conditions that do not differ systematically and only contain random measurement errors. In statistical terms, the variance in the distributions of test scores—essentially, the differences among individuals—is due partly to real differences in the knowledge, skill, or ability being tested (true variance) and due partly to measurement error inherent in the measurement process (error variance). The reliability coefficient is an estimate of the proportion of the total variance that is true variance.

Reliability coefficients range from 0 to 1. The higher the reliability coefficient for a set of scores, the more likely it is that the students would obtain very similar scores upon repeated testing occasions (assuming there is no memory or practice effect) if the students did not change in their level of the knowledge or skills measured by the test.

There are several different ways of estimating reliability. Marginal reliability (Green, Bock, Humphreys, Linn, & Reckase, 1984) is calculated after a typical CAA administration because it was more appropriate for the MST design. More details can be found in the next subsection, [*8.6.1 Marginal Reliability*](#_Internal_Consistency_Reliability).

The standard error of measurement (SEM) is a measure of the extent to which students’ scores tend to differ from their true scores. The larger the SEM, the more the variability of a student’s observed scores across repeated testing. Observed scores with large SEMs pose a challenge to the valid interpretation of test scores.

Also typically reported for the CAAs is the reliability of classification, which is an estimate of the proportion of students who are accurately and consistently classified into achievement levels. There are two kinds of classification reliability statistics: decision accuracy and decision consistency. Decision accuracy is the agreement between the classifications actually made and the classifications that would be made if the test scores were perfectly reliable. Decision consistency is the agreement between the classifications that would be made on two test forms.

#### Marginal Reliability

In classical test theory, the reliability coefficient can be defined as the squared correlation between the observed score and the true score, which is equal to the correlation between parallel observed scores (Lord and Novick, 1968, p.61). In applied settings, the requirement of repeated administrations is impractical, and methodologies estimating reliability from relationships among student performances on items within a single test form are often used. Coefficient alpha (Cronbach, 1951) is among the most common of these methodologies.

However, these classical test theory–based reliability indices are not directly applicable to an MST scenario because each student takes one of the three pathways based on the student’s ability. Therefore, an IRT-based approach called marginal reliability (Green, Bock, Humphreys, Linn, & Reckase, 1984) is used to estimate the reliability of MST scores. The estimates of reliability coefficients reported here are for item response model–based ability estimates. Because the scale score is a linear transformation of the ability estimate, the reliability coefficient of the ability estimates will also apply to the scale scores based on them.

This reliability coefficient for theta estimates,, is defined, based on the single test administration, as shown in equation 8.13. *Refer to the* [*Alternative Text for Equation 8.13*](#_Alternative_Text_for_17) *for a description of this equation.*

 (8.13)

where,

 is an ability estimate (i.e., theta score),

 is an average of the squared conditional standard error of measurement (CSEM) (i.e., error variances) at each value of the ability estimate, and

 is the measure of variance in ability estimates.

#### Standard Error of Measurement

The SEM provides a measure of score instability on the scale score metric. The SEM is the square root of the error variance in the scores (i.e., the standard deviation of the distribution of the differences between students’ observed scores and their true scores). The SEM is calculated using equation 8.14. *Refer to the* [*Alternative Text for Equation 8.14*](#_Alternative_Text_for_18) *for a description of this equation.*

 (8.14)

where,

 is the reliability estimated in equation 8.13, and

*St* is the standard deviation of the total score (either theta or scale score).

The SEM is useful in determining the confidence interval that likely captures a student’s true score. A student’s true score can be thought of as the mean of observed scores a student would earn over an infinite number of independent administrations of the test. Approximately 95 percent of the students will have scores within the range of their true scores: -1.96 SEMs to their true scores +1.96 SEMs (Crocker & Algina, 1986). For example, if a student’s observed score on a given test equals 345 points, and the SEM equals 5, one can be 95 percent confident that the student’s true score lies between 335 and 355 points (i.e., 345 ± 10).

#### Theta Scores Standard Error

For the CAAs for ELA and mathematics, theta scores are obtained through an IRT inverse TCC approach. The test information function (TIF) is the sum of information from each item on the test. The CSEM is the standard deviation of the distribution of theta scores that the student would earn under different testing conditions. In IRT, the only differences taken into account in the CSEM are those associated with different sets of items that could be presented to the student. In the framework of IRT, the CSEM is the reciprocal of the square root of the TIF based on the items taken by each student. The CSEM for a student with proficiency 𝜃𝑗 is calculated using equation 8.15. *Refer to the* [*Alternative Text for Equation 8.15*](#_Alternative_Text_for_19) *for a description of this equation.*

 (8.15)

where,

*I(θj)* is the test information for student *j*, and is calculated using equation 8.16. *Refer to the* [*Alternative Text for Equation 8.16*](#_Alternative_Text_for_22) *for a description of this equation.*

 (8.16)

where,

*Ii(θj)* is the item information of item *i* for student *j*.

Item information is calculated as presented in equation 8.17. *Refer to the* [*Alternative Text for Equation 8.17*](#_Alternative_Text_for_23) *for a description of this equation.*

 (8.17)

where,

*si(θj)* is the expected item score for item *i* on a theta score *θj* calculated as presented in equation 8.18 *(Refer to the* [*Alternative Text for Equation 8.18*](#_Alternative_Text_for_24) *for a description of equation 8.18.*)

 (8.18)

and equation 8.19. *Refer to the* [*Alternative Text for Equation 8.19*](#_Alternative_Text_for_25) *for a description of equation 8.19.*

 (8.19)

where,

*pih(θj)* is the probability of an examinee with *θj* getting score *h* on item *i*, the computation of which is shown in equation 8.4; and

*ni* is the maximum number of score points for item *i*.

#### Scale Scores Conditional Standard Errors

CSEMs for scale scores are computed by transforming CSEMs of theta scores onto the reporting scale. Refer to subsection [*8.3.2.3.2 Transformation from Theta Scores to Scale Scores*](#_8.3.2.3.2._Transformation_from)for scaling factors of transformation. A student’s CSEM for scale scores under the IRT framework is equal to the reciprocal of the square root of the TIF multiplied by the scaling factor *a*, as presented in equation 8.20. *Refer to the* [*Alternative Text for Equation 8.20*](#_Alternative_Text_for_26) *for a description of this equation.*

 (8.20)

where,

;

CSEM(*SS*) is the conditional SEM on scale score scale;

 is the TIF at ability level  as shown in equations 8.17, 8.18, and 8.19; and

*a* is the scaling factor (the slope) needed to transform theta to the scale score metric.

The value of *a* varies by content area (refer to the slope values in table 8.3).

CSEMs vary across the scale and are typically smaller in scale score units toward the center of the scale where more items are located, whereas they are larger at the extreme ends of the scale. When a test has threshold scores, it is important to provide CSEMs at the threshold scores.

Table 8.9 presents the scale score CSEMs at the lowest score required for a student to be classified in the Level 2—Alternate and Level 3—Alternate achievement levels for each CAA for the 2018–2019 administration.

Table 8.9 Scale Score CSEM at Achievement-Level Threshold for 2018–2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Content Area and Grade Level | Level 2—Alternate Scale Score Threshold | Level 2—Alternate CSEM | Level 3—Alternate Scale Score Threshold | Level 3—Alternate CSEM |
| ELA 3 | 345 | 6 | 360 | 7 |
| ELA 4 | 445 | 6 | 460 | 7 |
| ELA 5 | 545 | 6 | 560 | 7 |
| ELA 6 | 645 | 5 | 660 | 6 |
| ELA 7 | 745 | 6 | 760 | 7 |
| ELA 8 | 845 | 4 | 860 | 5 |
| ELA 11 | 945 | 5 | 960 | 5 |
| Mathematics 3 | 345 | 7 | 360 | 7 |
| Mathematics 4 | 445 | 6 | 460 | 8 |
| Mathematics 5 | 545 | 7 | 560 | 8 |
| Mathematics 6 | 645 | 7 | 660 | 8 |
| Mathematics 7 | 745 | 6 | 760 | 7 |
| Mathematics 8 | 845 | 7 | 860 | 8 |
| Mathematics 11 | 945 | 6 | 960 | 8 |

#### Decision Classification Analyses

When an assessment uses achievement levels as the primary method to report test results, accuracy and consistency of decisions become key indicators about the quality of the assessment.

The methodology used for estimating the reliability of classification decisions is described in Livingston and Lewis (1995). The necessary input information includes only the maximum and minimum possible scores on the assessment and the observed score distribution and the reliability coefficient for the group of students referenced by the estimates. The method was implemented using the ETS proprietary computer program RELCLASS-COMP (Version 4.14).

Decision accuracy describes the extent to which students are classified in the same way as they would be on the basis of the average of all possible forms of a test. Decision accuracy answers the question of how closely the actual classification of students, based on their single-form scores, agrees with the classification that would be made on the basis of their true scores, if their true scores could somehow be known.

Decision consistency describes the extent to which students are classified in the same way as they would be on the basis of a single form of an assessment other than the one for which data is available. Decision consistency answers the question of what the agreement is between the classifications based on two nonoverlapping, equally difficult forms of the test.

Decision consistency values are always lower than the corresponding decision accuracy values because in decision consistency, both of the classifications of the student are based on scores that depend on which form of the test the student took. In decision accuracy, only one of the classifications is based on a score that can vary in this way.

In each case, the proportion of classifications with exact agreement is the sum of the entries in the diagonal of the contingency table representing the bivariate distribution.

Decision accuracy at a particular threshold is estimated by partitioning the estimated bivariate distribution of true scores and observed scores (refer to table 8.10) into a two-by-two table, using the same threshold score on both variables. The decision accuracy statistic is the sum of the proportions in the cells representing consistent classifications—above the cut on both variables or below the cut on both variables. Decision consistency is estimated in the same way by partitioning the estimated bivariate distribution of observed scores on two forms of the test (refer to table 8.11).

Table 8.10 Decision Accuracy for Reaching an Achievement Level on the All Forms Average

|  |  |  |
| --- | --- | --- |
| True Status on All-Forms Average | Does Not Reach an Achievement Level | Reaches an Achievement Level |
| Does not reach an achievement level | Correct classification | Incorrect classification |
| Reaches an achievement level | Incorrect classification | Correct classification |

Table 8.11 Decision Consistency for Reaching an Achievement Level on a Hypothetical Alternate Form

|  |  |  |
| --- | --- | --- |
| Decision Made on the Form Taken | Does Not Reach an Achievement Level | Reaches an Achievement Level |
| Does not reach an achievement level | Consistent classification | Inconsistent classification |
| Reaches an achievement level | Inconsistent classification | Consistent classification |

### Validity Evidence

Validity refers to the degree to which each interpretation or use of a test score is supported by the accumulated evidence (American Educational Research Association [AERA], American Psychological Association [APA], & National Council on Measurement in Education [NCME], 2014; ETS, 2014). It constitutes the central notion underlying the development, administration, and scoring of tests and the uses and interpretations of test scores.

The validation process does not rely on a single study or gathering only one type of evidence. Rather, validation involves multiple investigations and different kinds of supporting evidence (AERA, APA, & NCME, 2014; Cronbach, 1971; ETS, 2014; Kane, 2006). It begins with the test design and is implicit throughout the entire assessment process, which includes item development and field testing, analyses of items, test scaling and linking, scoring, reporting, and score usage.

In this section, the evidence gathered is presented to support the intended uses and interpretations of scores for the CAA. This section is organized primarily around the principles prescribed by AERA, APA, and NCME’s *Standards for Educational and Psychological Testing* (2014). These *Standards* require a clear definition of the purpose of the test, a description of the constructs to be assessed, and the population to be assessed, as well as how the scores are to be interpreted and used.

The *Standards* identify five kinds of evidence that can provide support for score interpretations and uses:

1. Evidence based on test content
2. Evidence based on relations to other variables
3. Evidence based on response processes
4. Evidence based on internal structure
5. Evidence based on the consequences of testing

The next subsection defines the purpose of the CAAs, followed by a description and discussion of different kinds of validity evidence that have been gathered.

#### Evidence in the Design of the CAAs

##### Purpose

The CAAs are designed to assess students with the most significant cognitive disabilities whose individualized education program (IEP) teams have designated the use of an alternate assessment on the statewide summative assessments. The goal of the CAAs is to measure what students know and can do. These measures help identify and address gaps in knowledge or skills (CDE, 2019).

##### The Constructs to Be Measured

The CAAs for ELA and mathematics are designed to show how well students perform relative to the Core Content Connectors (Connectors) for ELA and mathematics, which were developed by the National Center and State Collaborative (NCSC). These Connectors are content targets linked to the Common Core State Standards (CCSS) and yet are less complex than the CCSS, while focusing on the main academic content at each subject and grade level.

The Connectors illustrate the necessary knowledge and skills needed to reach the learning targets within the CCSS at each grade level. The Connectors identify priorities in each content area to guide instruction for students in this population and for the alternate assessment.

Test blueprints are used to measure students’ mastery of the Connectors. They also provide an operational definition of the construct to which each set of standards refers and define the following for each content area:

* Subject to be assessed
* Tasks to be presented
* Administration instructions to be given
* Rules used to score student responses

The test blueprints control as many aspects of the measurement procedure as possible so that the testing conditions will remain the same over test administrations (Cronbach, 1971) to minimize construct-irrelevant score variance (Messick, 1989).

ETS developed all CAA for ELA and mathematics test items to conform to the SBE-approved Connectors and test blueprints (CDE, 2015a [ELA] and 2015b [mathematics]).

##### Interpretations and Uses of the Scores

Overall student performance is expressed as scale scores that are generated for the CAAs for ELA and mathematics. The total score is also used to classify students in terms of their achievement level in the content area by grade.

The grade- and content-specific achievement level descriptors (ALDs) describe what students at each achievement level know and can do, by grade and content area. The ALDs reflect the level of expectation on students’ performance, the specific content reflected in the CCSS and the Connectors, as well as the essential understandings (EUs). California educators gathered to develop the grade- and content-specific ALDs using the general performance level descriptors (PLDs), which provided the number of reporting levels and the general definition of each reporting level. The importance of the grade- and content-specific PLDs is that they define the knowledge or skill expectations at each achievement level on a functional basis, define the standards as they apply to threshold scores, and give standardized meaning to scores or score ranges.

A description of the uses and applications of the CAA for ELA and mathematics results is presented in [*Chapter 7: Scoring and Reporting*](#_Scoring_and_Reporting). Additional information can be found in the *CAASPP Post-Test Guide* (CDE, 2021).

The CAA test results have four primary purposes:

1. Help facilitate conversations between parents/guardians and teachers about student performance
2. Serve as a tool to help parents/guardians and teachers work together to improve student learning
3. Help staff from schools and local educational agencies identify strengths and areas that need improvement in their educational programs
4. Provide the public and policymakers with information about student achievement

More detailed descriptions regarding score use can be found in the *Education Code* Section 60602 web page on the California Legislative Information website.

##### Intended Test Population

Only eligible students may take the administration of the CAAs. Any student identified for alternate testing takes the CAAs. IEP teams “shall determine when a child with a significant cognitive disability shall take an alternate assessment aligned with the alternate academic achievement standards.”10F[[11]](#footnote-12)

#### Evidence Based on Test Content

Evidence based on test content refers to traditional forms of content validity evidence, such as the rating of test specifications and test items (Crocker, Miller, & Franks, 1989; Sireci, 1998), as well as alignment methods for educational tests that evaluate the interactions between curriculum frameworks, testing, and instruction (Rothman, Slattery, Vranek, & Resnick, 2002; Bhola, Impara, & Buckendahl, 2003; Martone & Sireci, 2009).

With MST test design, an additional dimension of content validity evidence is to ensure that the pathways and combination of two stages produce, for individual students, test forms that conform to the test blueprint. The extent to which test forms administered in 2020–2021 meet the blueprints is provided in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) and in table 4.A.1 through table 4.A.14 in [appendix 4.A](#_Appendix_4.A:_Test).

##### Description of the State Standards

The CAAs for ELA and mathematics are aligned with the alternate achievement standards, the Connectors, for ELA and mathematics. The purpose of the Connectors is to ensure that students with the most significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school ready for postsecondary options. The Connectors illustrate the necessary knowledge and skills needed to reach the learning targets within the CCSS and the knowledge and skills needed in each grade. They also identify priorities in each content area to guide the instruction for students in this population and for the alternate assessment (NCSC, 2014a [reading], 2014b [writing], and 2014c [mathematics]).

##### Item Specifications

Item specifications describe the characteristics of items that are written to measure each content standard. The specifications for ELA and mathematics are described in [*Chapter 3: Item Development and Review*](#_Item_Development_and).

##### Module Selection and Pathway

The routing rules for the stages are designed to cover the alternate content standards-based blueprints in the assembly of MST forms. The general module routing approach is based on the routing rules (refer to [*Chapter 4: Test Assembly*](#_Test_Assembly_2)) that evaluate a module’s contribution to each of these measures:

1. A measure of content match to the blueprint
2. A measure of overall test information
3. A measure of content complexity (tier)

##### Assessment Blueprints

The CAA test blueprints describe the content of the ELA and mathematics assessments for all grades tested and how that content is assessed. The test blueprints address the basic core content domains, the CCSS, the Connectors, and the EU for each standard. Each test is described by a single blueprint. The degree to which test forms administered in 2020–2021 meet the blueprint is provided in [*Chapter 4: Test Assembly*](#_Test_Assembly_2) and in table 4.A.1 through table 4.A.14 in [appendix 4.A](#_Appendix_4.A:_Test).

##### Form Assembly Process

The content standards, blueprints, and routing rules are the basis for choosing items and modules for each assessment. Additionally, item difficulty and the content complexity of items are provided to evaluate the statistical characteristics of test forms. Refer to [*Chapter 4: Test Assembly*](#_Test_Assembly_2) for information on the test assembly process.

#### Evidence Based on Response Processes

Validity evidence based on response processes refers to “evidence concerning the fit between the construct and the detailed nature of performance or response actually engaged in by students” (AERA et al., 2014, p. 12). This type of evidence generally includes documentation of activities such as

* systematic observations of test response behavior,
* showing the relationships of items intended to require demonstrations or applications of knowledge and skills to other measures that require similar levels of cognitive complexity in the content (i.e., teacher ratings of student performance), and
* evaluation of the reasoning processes students employ when solving test items (Embretson, 1983; Messick, 1989).

This type of evidence is used to confirm that the CAAs are measuring the cognitive skills that are intended as the objects of measurement and are used by students to respond to the items, for example, the Survey of Student Characteristics (SSC) and Student Response Check described in section [*5.1 Test Administration*](#_Test_Administration_1) in [chapter 5](#_Test_Administration). Also, use of the SSC is planned as part of a research agenda, and the goal is to improve routing during future administrations.

##### Testing Time Analysis

Testing time for each administration can be evaluated for consistency by examining the expected response processes for the items presented to students. The length of time it takes students to complete a test is collected and analyzed to build a profile describing what a typical testing event looks like for each content area and grade level. In addition, variability in testing time is investigated to determine whether a student’s testing time should be viewed as unusual or irregular. It should be noted that the CAAs for ELA and mathematics are untimed tests.

The students with no item response and students who did not answer at least four items were removed from these analyses. The remaining testing population is partitioned into quartiles based on scale scores. These quartile groupings are not the same as the achievement levels. Testing time analysis was not conducted following the 2020–2021 administration because of small sample sizes. This subsection describes analyses performed and results reported after typical CAA administrations.

Descriptive statistics of the time required to complete the total test are computed for each of the four quartile groups by content area and grade level and are typically reported in this subsection.

Some cases of extremely long testing time may be attributed to students with special needs taking longer to complete the tests, or the test not being closed down properly. With that being said, the results should be interpreted with caution. The medians (50th percentile) are more meaningful in the interpretation of the time comparisons because medians are less impacted by extreme values than means.

#### Evidence Based on Internal Structure

Internal structure evidence evaluates the strength or salience of the major dimensions underlying an assessment using indices of measurement precision such as DIF analyses, test reliability, decision accuracy and consistency, generalizability coefficients, conditional and unconditional SEMs, and TIFs.

Descriptions are based on analyses conducted after a typical test administration.

##### Dimensionality

A dimensionality study was conducted for all 14 CAAs for ELA and mathematics using data from the 2017–2018 test administration. The results indicated that practical unidimensionality holds for all 14 assessments and supported the unidimensional interpretation and reporting of CAAs for ELA and mathematics scores that are currently used (ETS, 2019).

##### Differential Item Functioning

DIF analyses are conducted to assess differences in the item performance of groups of students who differ in their demographic characteristics. For both ELA and mathematics, sometimes a few items are identified as having significant levels of DIF.

##### Overall Reliability Estimates

After a typical test administration, the results of reliability analyses on the theta scores and scale score for each test would be presented in subsection [*8.6.2 Standard Error of Measurement*](#_Standard_Error_of).

##### Student Groups Reliability Estimates

The reliabilities are also examined for various student groups. The student groups considered are based on gender, ethnicity, economic status, primary disability, migrant status, and English language fluency.

##### Reliability of Performance Classifications

The methodology used for estimating the reliability of classification decisions is described with the decision classification analyses in subsection [*8.6.5 Decision Classification Analyses*](#_Decision_Classification_Analyses).

##### Correlations Between Content Area Test Scores

The degree to which students’ content area test scores correlate as expected provides evidence that those scores are measuring the intended constructs. This subsection typically would present a table providing the correlations between scores on the ELA and mathematics tests and the number of students on which these correlations are based (Cohen, 1988). This analysis was not conducted for the 2020–2021 administration because of small sample sizes.

#### Evidence Based on Relations to Other Variables

Evidence based on *relations to other variables* can be evaluated using the correlation between the CAAs for ELA and mathematics scores and the CAA for Science scores, as both target the same student population and a large enough number of students take both annually. This type of evidence is essential for supporting the validity of certain inferences based on scores from the CAAs for ELA and mathematics.

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### Accessibility Information

#### Alternative Text for Equation 8.1

P value sub dich equals the fraction with the numerator the sum of X sub ij and the denominator N sub i end fraction.

#### Alternative Text for Equation 8.2

P value sub poly equals the fraction with the numerator the sum of X sub ij and the denominator N sub i times Max of X sub I end fraction.

#### Alternative Text for Equation 8.3

r sub polyreg equals the fraction Beta hat times S sub tot divided by the square root of Beta hat squared times S sub tot squared plus 1.

#### Alternative Text for Equation 8.4

P sub ih of theta sub j equals:

The numerator exp open parenthesis the sum from v equals 1 to h of D times a sub i open parenthesis theta sub j minus b sub I plus d sub iv close parenthesis close parenthesis divided by the denominator open parenthesis 1 plus the sum from c equals 1 to n sub I exp open parenthesis the sum from v equals 1 to c of D times a sub I open parenthesis theta sub j minus b sub I plus d sub iv close parenthesis close parenthesis, if score h equals 1, 2, …, n sub i.

P sub ih of theta sub j equals:

1 divided by the denominator open parenthesis 1 plus the sum from c equals 1 to n sub I exp open parenthesis the sum from v equals 1 to c of D times a sub I open parenthesis theta sub j minus b sub I plus d sub iv close parenthesis close parenthesis close parenthesis, if score h equals 0.

#### Alternative Text for Equation 8.5

Z equals the numerator open absolute symbol, D subtracts Md sub D, close absolute symbol, divided by the denominator of 0.74 times IQR.

#### Alternative Text for Equation 8.6

Epsilon of theta equals the sum from i equals 1 to ndich of P sub i of theta plus the sum from j equals 1 to npoly over each sum of x equals 1 to m of s sub xj times P sub xj of theta.

#### Alternative Text for Equation 8.7

Scale score equals intercept plus slope times theta-hat.

#### Alternative Text for Equation 8.8

Slope equals the numerator 60 minus 45 divided by the denominator theta-hat sub Level 3 minus theta-hat sub Level 2.

#### Alternative Text for Equation 8.9

Intercept equals 60 minus theta-hat sub Level 3 times open parenthesis the numerator 60 minus 45 divided by the denominator theta-hat sub Level 3 minus theta-hat sub Level 2 close parenthesis.

#### Alternative Text for Equation 8.10

Alpha sub MH equals the numerator open parenthesis the sum sub m of R sub rm times W sub fm divided by N sub tm close parenthesis divided by the denominator open parenthesis the sum sub m of R sub fm times W sub rm divided by N sub tm closed parenthesis.

#### Alternative Text for Equation 8.11

MH D-DIF equals negative 2.35 times the natural logarithm open bracket alpha sub MH close bracket.

#### Alternative Text for Equation 8.12

SMD equals the fraction with numerator the sum from m equals 1 to M of N sub fm times open parenthesis E sub f of Y from X equals m minus E sub r of Y from X equals m closed parenthesis divided by denominator the sum from m equals 1 to M of N sub fm end fraction.

#### Alternative Text for Equation 8.13

Rho sub theta hat theta hat prime equals 1 minus M sub CSEM squared sub theta hat divided by s squared sub theta hat.

#### Alternative Text for Equation 8.14

SEM equals s sub t times the square root of 1 minus rho of theta hat theta hat prime.

#### Alternative Text for Equation 8.15

CSEM of Theta sub j equals 1 divided by the square root of I of theta sub j.

#### Alternative Text for Equation 8.16

I of theta sub j equals the sum from i equals 1 to n of I sub i of theta sub j.

#### Alternative Text for Equation 8.17

I sub i of theta sub j equals open bracket s sub i2 of theta sub j minus s sub i squared of theta sub j.

#### Alternative Text for Equation 8.18

S sub i of Theta sub j equals the sum from h equals zero to n of h times p sub ih of Theta sub j.

#### Alternative Text for Equation 8.19

S sub i2 of Theta sub j equals the sum from h equals zero to n sub i of h squared times p sub ih of Theta sub j.

#### Alternative Text for Equation 8.20

CSEM of SS equals 1 times a divided by the square root of I of theta hat.

## Quality Control Procedures

The California Department of Education (CDE) and ETS implemented rigorous quality control procedures throughout the test development, administration, scoring, analyses, and reporting processes. As part of this effort, ETS staff worked with its Office of Professional Standards Compliance, which publishes and maintains the *ETS Standards for Quality and Fairness* (ETS, 2014). These *Standards* support the goals of delivering technically sound, fair, and useful products and services; and assisting the public and auditors evaluating those products and services. Quality control procedures are outlined in this chapter.

### Quality Control of Item Development

ETS’ goal is to provide the best standards-based items for the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics. Items developed for the CAAs for ELA and mathematics underwent an extensive item review process. The item writers responsible for developing CAA items were trained in California Assessment of Student Performance and Progress (CAASPP) and ETS policies on quality control of item content, sensitivity, and bias guidelines, as well as guidelines for accessibility to ensure that the items allow the widest possible range of students to demonstrate their content knowledge.

Once a written item was accepted for authoring—that is, once it was entered into ETS’ item bank and formatted for use in an assessment—ETS employed a series of internal and external reviews. These reviews used established criteria and specifications to evaluate the quality of items and to ensure that each item measured what it was intended to measure. These reviews also examined the overall quality of the test items before they were presented to the CDE and item reviewers. Finally, a group of California educators reviewed the items for accessibility, bias and sensitivity, and content prior to their administration to students. The details on quality control of item development are described in section [*3.2 ETS Item Review Process*](#_ETS_Item_Review).

### Quality Control of Test Assembly and Delivery

The assembly of all test forms must conform to blueprints that represent a set of constraints and specifications. There are separate specifications for the ELA and mathematics assessments (CDE, 2015a [ELA] and 2015b [mathematics]). These blueprints are critical to the formation of valid assessments.

Quality assurance (QA) checks on each constructed test form are critical to overall test integrity.

#### Quality Control of Test Form Development

ETS conducted multiple levels of QA checks on each constructed test form to ensure it met defined statistical criteria. Both ETS Assessment and Learning Technology Research & Development (ALTRD) and psychometric staff reviewed and signed off on the accuracy of forms before the test forms were put into production for the operational administration. Detailed information related to test assembly can be found in section[*4.3 Test Production Process*](#_Test_Production_Process).

In particular, the assembly of all test forms went through a certification process that included various checks to verify that

* all answers were correct;
* items were scored correctly in the item bank;
* all items aligned with the standard;
* all content in the item was correct;
* distractors were plausible;
* multiple-choice (MC) item options were parallel in structure;
* language was grade-level appropriate;
* no more than three MC items in a row had the same key;
* all graphics were correct (copyright, spelling, relevance, etc.);
* there were no errors in grammar, spelling, punctuation, and the like;
* items adhered to the approved style guide; and
* all items met the statistical criteria.

Reviews were also conducted for functionality and sequencing during the user acceptance testing process to ensure all items functioned as expected.

#### Quality Control of Test Assignment

Test assignment for the CAASPP, including the CAAs for ELA and mathematics, is controlled by the Test Operations Management System (TOMS), using student demographic information received from the California Longitudinal Pupil Achievement Data System (CALPADS) (CDE, 2021). The two systems are kept in sync during the testing window.

Students at eligible grade levels were assigned to the Smarter Balanced assessments by default. For students eligible for the CAAs for ELA and mathematics, local educational agencies (LEAs) logged on to TOMS and assigned students to take the alternate assessment, which automatically unassigned those students from taking Smarter Balanced Summative Assessments.

The quality of test assignment for the CAAs was monitored and controlled through several strategies. TOMS enforced preconditions for eligibility for the CAAs by permitting assignment only for students with an Individuals with Disabilities Education Act (IDEA)11F[[12]](#footnote-13) indicator of “Yes” as sent by CALPADS.

Additionally, TOMS prevented the prohibited “mixing and matching” of assessments. For example, a student assigned to take an alternate assessment for any content area will automatically be prevented from assignment to a general assessment for another content area.

#### Quality Control of Test Administration

The quality of test administration was managed through comprehensive rules and guidelines for maintaining the security and standardization of CAASPP assessments, including the CAA. LEAs received training on these topics and were provided with tools to report security incidents and resolve testing discrepancies for specific testing sessions.

Several strategies were used to monitor and control the quality of test administration for the CAA as well as all assessments administered as part of the CAASPP System. A fully staffed support center, the California Technical Assistance Center (CalTAC), supported all LEAs in the administration of CAASPP assessments. CalTAC was guided by a core group of LEA outreach and advocacy staff that managed communications to LEAs, regional and web-based trainings, and a website that housed a full range of manuals, videos, and other instructional and support materials. In addition to providing guidance and answering questions, CalTAC regularly conducted outreach campaigns on particular administration topics to ensure all LEAs understood correct test administration procedures.

The quality of test administration was further managed through comprehensive rules and guidelines for maintaining the security and standardization of CAASPP assessments, including the CAA. LEAs received training on these topics and were provided tools for reporting security incidents and resolving testing discrepancies for specific testing sessions.

The ETS Office of Testing Integrity (OTI) reinforced the quality control procedures for test administration by providing QA services for all testing programs managed by ETS. The detailed procedures OTI developed and applied in quality control are described in subsection [*5.2.1. ETS’ Office of Testing Integrity*](#_ETS’_Office_of).

### Quality Control of Test Materials

#### Developing Computer-based Assessments

The steps taken to develop and ensure the quality of the computer-based assessments are described in [*Chapter 4: Test Assembly*](#_Test_Assembly_2).

#### Test Administration Manuals

ETS staff consulted with internal subject matter experts and conducted validation checks to verify that test directions and administration manuals accurately matched the test materials and testing processes. Copy editors and content editors reviewed each document for spelling, grammar, accuracy, and adherence to CDE style. Each document was required to be approved by the CDE before it could be published to the CAASPP website; only nonsecure documents were posted on this website. Secure materials, such as the *CAA Directions for Administration*, were made available to designated LEA staff through TOMS, which required a secure logon.

The manuals used in the administration of the CAAs are listed in subsection [*5.4.4 Instructions for Test Examiners and Staff Involved in CAA Administration*](#_Instructions_for_Test).

#### Processing Test Materials

The following information was entered into the test delivery system (TDS) by the student or the test examiner and transmitted from CAI to ETS each day:

* Student’s first name
* Statewide Student Identifier
* Responses for each item

The CAI and ETS systems checked for the completeness of the student record and flagged records that were identified as having an error. For example, the system would identify a test module that was missing a content registration ID, a unique identifier that matched the student’s opportunity in the final scoring.

### Quality Control of Scoring

#### Development of Scoring Specifications

ETS scoring specifications for the CAA were completed, approved, and checked well in advance of the receipt of student response data. These specifications contained detailed scoring procedures and routing rules, as well as the procedures for determining whether a student attempted a test and whether that student’s response data should be included in the statistical analyses and computing summary data.

#### Development of Scoring Procedures

ETS’ Enterprise Score Key Management (eSKM) system used scoring procedures specified by ETS Psychometric Analysis & Research (PAR) staff and provided scoring services. ETS psychometricians carried out a series of quality control checks after scoring to ensure the accuracy of each score.

Prior to the test administration, ETS ALTRD staff reviewed and verified the keys and scoring rubrics for all items. These keys and rubrics were then provided to CAI for its machine-scoring implementation. After CAI finished machine scoring, those scores and responses were delivered to ETS. CAI quality control of the machine-scoring procedure is described in subsection [*9.2.3 Quality Control of Test Administration*](#_Quality_Control_of_1).

ETS’ Centralized Repository Distribution System and Enterprise Service Bus departments collected and parsed .xml files that contained student response data from CAI. ETS’ eSKM system collected and calculated individual students’ overall scores (total raw scores) and generated student scores in the approved statistical extract format. These data extracts were sent to ETS’ Data Quality Services (DQS) for data validation. Following successful validation, the student response statistical extracts were made available to the psychometric team.

ETS developed two parallel scoring systems to produce and verify student scores:

1. The eSKM scoring system received an individual student’s item scores and item responses from CAI and calculated individual student scores for ETS’ reporting systems.
2. The ETS PAR team computed individual student scores based on item scores delivered by CAI.

The scores from the two sources were then compared for internal quality control. Any differences in the scores were discussed and resolved. All scores complied with the ETS scoring specifications and passed the parallel scoring process to ensure the quality and accuracy of scoring and to support the transfer of scores into TOMS, the database of the student records scoring system.

#### Quality Control of Machine-Scoring Procedures

To ensure valid item-level scoring for the CAAs for ELA and mathematics, quality control procedures were employed by Cambium Assessment, Inc. (CAI), the CAASPP subcontractor responsible for providing the TDS and scoring machine-scorable items. CAI psychometric staff members independently reviewed all CAAs for ELA and mathematics test forms by taking sample tests. Responses to the test forms were compared with the answer keys for each form to confirm the accuracy of scoring keys. Score outcomes were contemplated above and below each of the routing thresholds to ensure that the appropriate test stage was assigned in each instance according to the score thresholds approved by the CDE. The scores for all applicable items were recorded prior to the routing action. A final comparison of the test map to each computer-based form as configured in the user acceptance test environment ensured that no changes to the form were introduced prior to operational deployment.

A real-time, quality-monitoring component was built into the TDS. After a test was administered to a student, the TDS passed the resulting data to the QA system. QA conducted a series of data integrity checks, ensuring, for example, that the record for each test contained information for each item, keys for MC items, score points in each item, and the total number of operational items. In addition, QA also checked to ensure that the test record contained no data from items that had been invalidated.

Data passed directly from the quality monitoring system to the database of record, which served as the repository for all test information, and from which all test information for reporting was pulled and transmitted to ETS in a predetermined results format.

### Quality Control of Psychometric Processes

Psychometricians on the ETS PAR team verified the eSKM scoring by comparing the parallel scoring programs. They also conducted extensive analyses including item analyses, differential item functioning, item response theory (IRT) calibration, linking, and scaling.

The psychometric analyses conducted at ETS underwent comprehensive quality checks by a team of psychometricians and data analysts. Detailed checklists were developed by members of the team for each of the statistical procedures performed on each of the CAAs for ELA and mathematics. Classical item analyses were performed to evaluate the performance of items, such as item difficulties and correlation between item scores and total scores. Items that were flagged for questionable statistical attributes were sent to ALTRD staff for review; ALTRD comments were then reviewed by the psychometricians before items were approved for inclusion in calibration.

During the calibration process, checks were made to ascertain that the input files were established accurately. Checks were also made on the number of items, number of examinees with valid scores, IRT item difficulty estimates, standard errors for the item difficulty estimates, and the linking and scaling process. Two psychometricians conducted parallel calibration processing and compared the results to check for any inconsistency. Psychometricians also performed detailed reviews of relevant statistics to determine whether the chosen IRT model fit the data. In addition, the results of the calibration procedures were reviewed by a psychometric manager.

Once raw-to-scale score conversion tables for each form were generated, psychometricians carried out quality control checks on each scoring table to verify

* all possible raw scores for each form were included in the tables;
* the lowest obtainable scale score (LOSS), LOSS+1, and the highest obtainable scale score matched the specifications for each grade, respectively; and
* the threshold score for the performance level was correctly identified.

After all quality control steps were completed and any differences were resolved, one final inspection of scoring tables was conducted prior to uploading the tables to eSKM for score reporting.

### Quality Control of Reporting

To ensure the quality of CAAs for ELA and mathematics test results for both individual student and summary reports, three general areas were evaluated:

1. Comparison of report formats with input sources from the CDE-approved samples
2. Validation of the report data through quality control checks performed by ETS’ DQS and Center of Reporting & Scoring Services teams, as well as running of all the Student Score Reports through ETS’ patented Quality Control Interrogator software, which compares elements of the student score report to acceptable values to identify errors and is used in conjunction with human review to detect errors on every score report batch as part of quality control procedures
3. Proofreading of the quality control and production reports by the CDE and ETS prior to making reports available to the LEA for download in TOMS and California Educator Reporting System as well as via the LEA’s student information system

All reports were required to include a single, accurate LEA code, an LEA name, and a school name. All elements conformed to the CDE’s official county/district/school (CDS) code and naming records. From the start of processing through scoring and reporting, the CDS Master File was used to verify and confirm the accuracy of codes and names. The CDE provided a revised LEA Master File to ETS throughout the year as updates became available.

After the reports were validated in accordance with CDE requirements, a set of reports representing all possible grades, content areas, and reporting outcomes was provided to the CDE and ETS for review and approval. Electronic reports were sent on the actual report template to the CDE. The CDE and ETS reviewed and approved the reports after a thorough examination.

Upon the CDE’s approval of the reports generated for the quality control LEAs, ETS continued with the report production. The quality control LEAs comprised CDE-selected LEAs to validate a subset of LEAs that contained key reporting characteristics and demographics of the state. The reviewed set of reports incorporated CDE-selected LEAs and provided the final check prior to generating the reports and making them electronically available for download in TOMS and for student information systems through an application programming interface.

#### Exclusion of Student Scores from Summary Reports

ETS provided the CDE with reporting specifications that documented when to exclude student scores from summary reports. These specifications included the logic for handling submitted assessments that, for example, identified students who tested but responded to no items, who were absent, who were not tested because of parent/guardian request, or who did not complete the test because of illness. The methods for handling other anomalies were also covered in the specifications. These anomalies are described in more detail in subsection [*7.3.2 Special Cases*](#_Special_Cases).

### Quality Control of End-to-End Testing

ETS conducted end-to-end testing prior to the start of the test administration. The purpose of this testing was to verify that all systems, processes, and resources were ready for the operational administration. ETS employed a number of approaches to verify ongoing systems performance, including monitoring of system availability and system usage. Time was allotted for user acceptance testing to confirm that the systems met requirements and to make identified corrections before final deployment. To accomplish system acceptance and sign off, ETS deployed systems to a staging area, which mirrored the final production environment, for operational and user acceptance testing. Final approval by the CDE triggered the final deployment of the system.

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## Continuous and Systematic Improvement

The sixth operational administration of the California Alternate Assessments (CAAs) for English language arts/literacy (ELA) and mathematics was offered during the 2020–2021 school year. Over the past four years, continuous efforts have been made to improve the assessments in various ways. This chapter summarizes the completed and ongoing improvements for the CAAs for ELA and mathematics, including in the areas of test design, psychometric analyses, equating, and accessibility.

### Test Design

ETS works in collaboration with the California Department of Education (CDE) in planning, proposing, evaluating, and improving CAA test design.

The CAAs for ELA and mathematics have been administered using a multistage test (MST) design since they were first administered operationally, during the 2015–2016 California Assessment of Student Performance and Progress (CAASPP) administration. The 2015–2016 administration was also the starting point for establishing the item pool required for MSTs.

#### 2015–2016 Design

The assessments each had two stages, with two spiraled routers in Stage 1 and three modules in Stage 2. Although the original plan was to have one router and three modules, two router versions were administrated in 2015–2016 to collect more items for the item pool. The test was composed of 21 items in each router version and 6 items in each of the three Stage 2 modules. This test design facilitated the collection of item information for up to 50 unique items in each test. Prior to the start of a student’s testing, the test examiner administered a Survey of Student Characteristics (SSC) to collect students’ background information.

#### 2016–2017 Design

Only one router was administered during the 2016–2017 administration. This configuration took into consideration that there were already items with statistics obtained from the 2015–‍2016 administration. The test was composed of 10 selected operational items in the router, three embedded field test items (five versions), and 15 operational items in each of the three Stage 2 modules, which allowed sufficient estimates of student ability in Stage 2. Finally, to reduce the amount of work done by the test examiner, the SSC was reduced to three short questions asked at the end of each test.

#### 2017–2018 Design

For the 2017–2018 administration, a similar design to that of the 2016–2017 administration was used but with one more field test item added to expand the item pool. The assessment included 10 operational items in the router, four embedded field test items, and 15 operational items in each of the easy, moderate, and hard modules. The same three-question survey used during the 2016–2017 administration was presented to test examiners at the end of the assessment.

This design supported successful testing experiences and accurate student ability estimation for most students. However, the analysis of the estimated test information functions (TIFs) revealed a lack of differentiation across the three MST pathways for some grade levels and content areas. Instead, two second-stage modules would be sufficient to separate students with different abilities across all grade levels and content areas. Refer to figure 10.A.1 through figure 10.A.28 in [appendix 10.A](#_Appendix_10.A:_Test) for test information curves12F[[13]](#footnote-14) based on the spring 2019 observed data in table 10.A.1 through table 10.A.28.

#### 2018–2019 Design

After the 2017–2018 administration, ETS evaluated and refreshed the existing item bank based on three years of data. After the item bank was refreshed and the language complexity of CAA for ELA and mathematics items was lowered (described in the next section, [10.2](#_Item_Development_and_1)), analysis showed very little separation in the average difficulties between the moderate Stage 2 module and hard Stage 2 module for some grade-specific tests in the refreshed item bank. This finding, along with findings based on test information curves, led to a test design change for the 2018–2019 forms that the CDE and ETS jointly proposed and agreed to implement. In the new test design, the moderate Stage 2 module was removed, leaving the easy and hard modules in Stage 2. The number of items at each tier level for the revised test design with one router and two Stage 2 modules is listed in table 10.1.

Table 10.1 Number of Items at Each Tier Level for Stage 2 Modules in the 2018–2019 Administration

|  |  |  |  |
| --- | --- | --- | --- |
| Tier | Router | Stage 2 Easy | Stage 2 Hard |
| 1 | 6–7 items | 7–8 items | 3 items |
| 2 | 3–4 items | 4–5 items | 4–5 items |
| 3 | 0 items | 3 items | 7–8 items |
| **Total:** | **10 operational items** | **15 operational items** | **15 operational items** |

In addition, to further reduce test examiners’ burden and considering the limited use of the extracted information, the three-question survey at the end of the CAAs for ELA and mathematics was removed for the 2018–2019 forms.

#### 2019–2020 Design

In the 2019–2020 administration, ETS reused the operational test forms from the 2018–‍2019 administration of the CAAs for ELA and mathematics as part of a larger effort to support the transition of these assessments to a preequated design by the 2021–2022 administration. For each test form, ETS used the same operational items in the Stage 1 router and Stage 2 modules but replaced the field test items that appear in Stage 1.

In spring 2019, ETS proposed an approach to the CAASPP Technical Advisory Group (TAG) to transition the CAAs for ELA and mathematics from a postequating design to a preequated design for the 2020–2021 test administration. TAG members shared concerns similar to ETS’ regarding the potential misestimation of item response theory parameters because of the restriction of range associated with the MST design. The decision to launch the MST during the first operational year was intended to provide the most appropriate test-taker experience for the students taking the CAA.

One implication of this approach meant that newly developed items were administered as operational items in second-stage modules. In many instances, these items were not administered to the full range of abilities that characterize the students eligible to take the CAAs. This lack of student representation impacted the generalizability of the parameter estimates for the full population of students taking the CAA. The impacted items—those whose parameters were estimated at Stage 2—were readministered through the embedded field test slots to ensure those items were being exposed to representative samples and hence, lead to more accurate parameter estimates for those items.

#### 2020–2021 Design

The novel coronavirus disease 2019 (COVID-19) pandemic severely impacted the testing window during the 2019–2020 administration. The testing window’s suspension on March 18, 2020, occurred before nearly all registered students could take the CAAs for ELA and mathematics. Consequently, the embedded field test items on the 2019–2020 forms were not exposed to a representative sample during the 2019–2020 administration. Given the continued need to gather more accurate parameter estimates of the 2019–2020 forms’ field test items, ETS reused test forms from the 2019–2020 administration of the CAAs for ELA and mathematics. For each test form, ETS used the same operational items in the Stage 1 router and Stage 2 modules and the same field test items that appear in Stage 1, except for the replacement of one field test item in the CAA for mathematics for grade eleven. Additionally, the 2020–2021 operational test forms were identical to the 2018–2019 operational test forms.

### Item Development and Item Bank Refreshing

For the 2018–2019 item development cycle, the ETS content teams used revised item specifications and lowered the language complexity of CAAs for ELA and mathematics in developing new items and refreshing existing ELA and mathematics items. Items developed and refreshed for this cycle, when compared to those items developed previously, featured significantly shorter reading passages, fewer sentences with complex structures, and a reduced number of multisyllabic words. When these items were shared with teacher panelists prior to field test administration, the feedback received was positive and enthusiastic.

This item bank refreshing work will continue through subsequent development cycles, with the goal of phasing out higher-complexity items over the next few test administrations.

### Introduction of Operationalized Second Scoring

Results of a federal peer review of the CAA for ELA identified a need for additional validity evidence of rubrics using test examiner judgement. Critical Element 4.4 of *A State’s Guide to the U.S. Department of Education’s Assessment Peer Review Process* (U.S. Department of Education, 2018) requires that any scoring involving human judgment, including scoring conducted by test examiners, must contain evidence that the scoring of these items includes adequate procedures and criteria for ensuring and documenting interrater reliability. All rubric-scored items in the CAA for ELA are scored at the time of testing by the test examiner observing the student’s response; as such, second scoring will need to be conducted by a secondary test examiner present at the time of testing.

In response to this peer-review finding, ETS had originally prepared for an operationalized solution for second scoring to be implemented in the 2020–2021 administration year. However, because of the small sample size anticipated as a result of few students participating in the in-person testing required for CAA for ELA administration during both the 2019–2020 and 2020–2021 administrations, this solution will be deferred until the 2021–2022 administration.

### Feedback for Continuous Improvement Survey

#### Interested Educator Feedback

The CAASPP program solicits feedback annually from various interested educator groups, including local educational agency (LEA) CAASPP coordinators, CAASPP test site coordinators, test administrators, and test examiners, through the CAASPP Feedback for Continuous Improvement Survey (formerly the “Post-Test Survey”). Feedback is typically collected via a survey of more than 10,000 California educators and a focus group study with over 40 participants.

However, because of the impact of the COVID-‍19 pandemic, the administrations of a post-test survey for the CAAs for ELA and mathematics after both the 2019–2020 and the 2020–2021 administrations gathered responses from far too few California educators. Any statistical analysis of the post-test survey results from either administration could provide misleading results, as the sample of California educators responding to the survey may be unrepresentative of all California educators. The most recent administration of a post-test survey for the CAAs for ELA and mathematics with a sufficiently large sample of California educators responding to the survey was conducted after the 2018–2019 administration.

#### Commitment to Preparation and Training Resources

After the 2018–2019 administration, when asked about preparation and training resources for the CAAs, survey respondents found them to be helpful overall. When asked if the online, self-guided Test Examiner Tutorial provided all the training necessary for CAA test examiners, 87 percent of all respondents agreed it did. More than 80 percent of respondents found the tutorial to be helpful in preparing them to administer the CAA.

The Test Examiner Checklists were found to be helpful by 65 percent of respondents; the CAA for Science Webcast and the Practice Test Scoring Guides were the least-accessed materials.

To improve the dissemination of information to all educators involved in the CAAs, ETS plans to communicate more information to LEA CAASPP coordinators and CAA test examiners at the same time. The survey results support this strategy, with 48 percent of LEA CAASPP coordinators delegating CAA testing activities to special education staff and 55 percent agreeing that ETS should send CAA communications to all relevant audiences.

### Psychometric Analyses

#### Levels of Item Analyses

Since the 2016–2017 administration of the CAAs for ELA and mathematics, composite items in grades three, five, six, and eight for ELA and all grades for mathematics assessments were included in the administration and item analyses.

Each composite item has two parts. In the 2016–2017 administration year, the overall performance of the composite items was analyzed and reported. To better understand how composite items performed—not only in terms of overall performance, but also with regard to each composite part—ETS conducted item analyses for both the composite whole and composite parts after test administration in 2018–2019. Additionally, the in-house tools ETS used brought about improved analysis. The composite-part item analyses helped assessment developers and teacher reviewers better understand those composite items.

#### Types of Item Analyses

ETS has analyzed CAA items from the first year the CAAs for ELA and mathematics were administered, including the following types of analyses:

* Item difficulty
* Item discrimination
* Item score distributions
* Differential item functioning

However, distractor analyses were conducted only for multiple-choice (MC), single-select items in the previous administrations, because of the complexity of the structures of other item types and effectiveness of analysis tools. For the 2018–2019 CAAs for ELA and mathematics administration, ETS added distractor analyses for all item types except MC, multiple-attempt items, which were scheduled to be phased out gradually at the CDE’s request.

ETS observed that a large number of polytomous items were flagged erroneously in the 2018–2019 administration based solely on the distractor analysis. For the 2020–2021 administration, ETS will not flag polytomous items based only on distractor analyses but, instead, will combine the distractor analyses with other statistics, such as item difficulty or item discrimination, to determine whether a polytomous item should be flagged for additional content review.

#### Interrater Reliability Analysis

A requirement in Critical Element 4.4 of the U.S. Department of Education’s Assessment Peer Review Process (Department of Education, 2018) indicates that any scoring involving human judgment—including scoring conducted by test examiners—must contain evidence that the scoring of these items includes adequate procedures and criteria for ensuring and documenting interrater reliability. The CAA for ELA administers a subset of items that are scored by rubrics and so requires documentation of interrater reliability.

To meet this requirement, ETS conducted a preliminary interrater reliability analysis during the 2018–2019 administration. However, very few LEAs participated and, consequently, the sample sizes were extremely small, making the analysis results of limited utility. In response, the CDE and ETS are developing a comprehensive sampling plan that will identify LEAs that will be required to provide an independent second rating on the rubric-based items so that generalizable agreement statistics can be provided.

### Equating

#### Transitioning from Postequating to Preequating for the 2022–2023 Administration

To determine whether it is psychometrically defensible to transition to a preequated test design, a preequating investigation will occur during the 2022–2023 administration. Conversion tables based on preequating and postequating will be created and compared for an investigation of the differences between preequated and postequated results. ETS will use three criteria to evaluate the equating results including the percentage difference at any performance level, the differences that matter (Dorans & Feigenbaum, 1994) on the raw score scale, and whether the scale score differences exceed more than one CSEM. A decision to transition to preequating or continue with postequating will be made after the 2022–2023 administration on the basis of this investigation.

### Research-based Operational Work

To investigate whether the current unidimensional interpretation and reporting of CAAs for ELA and mathematics scores are supported, ETS, at the request of the CDE, conducted a comprehensive dimensionality study using data from 2017–2018 test administration for the ELA and mathematics assessments at all administered grade levels (ETS, 2019). ETS applied the bifactor-model-based method (Reise, 2012; Reise, Morizot, & Hays, 2007) and found that practical unidimensionality holds for both ELA and mathematics assessments across seven grades. This finding provides supported validity evidence for the CAAs for ELA and mathematics.

### Accessibility

Like all CAASPP assessments, the CAAs are administered using the test delivery system (TDS) created by Cambium Assessment, Inc., for the Smarter Balanced assessments. As such, implementation of new computer-based universal tools, designated supports, and accommodations are aligned with the TDS.

### References

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### Appendix 10.A: Test Information Function Curves for 2020–2021 Forms

TIF is a measure of the amount of information provided by a test at a given score level. Figure 10.A.1 through figure 10.A.28 present TIFs by theta level and scale score for ELA and mathematics at each grade level. Data used to generate these figures is presented in table 10.A.1 through table 10.A.28.

#### TIF for ELA, Grade Three

Figure 10.A.1 plots TIF by theta level for grade three ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.1. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.01, where theta is -0.95; or, for the hard pathway, when it reaches its peak at 7.74, where theta is -0.31. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.95; and among students routed to the hard pathway who have theta scores near -0.31. The test derives little information for students with theta scores that are either less than -4 or greater than 2.

Figure 10.A. TIF by theta—ELA, grade three

Table 10.A. ELA, Grade Three Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.3186 | -6.0000 | 0.2534 |
| -4.8362 | 0.9501 | -4.5859 | 0.9237 |
| -4.0892 | 1.8054 | -3.8089 | 1.7134 |
| -3.6290 | 2.5773 | -3.3195 | 2.3999 |
| -3.2861 | 3.2762 | -2.9487 | 3.0112 |
| -3.0073 | 3.9118 | -2.6442 | 3.5700 |
| -2.7690 | 4.4925 | -2.3827 | 4.0929 |
| -2.5586 | 5.0248 | -2.1520 | 4.5889 |
| -2.3687 | 5.5135 | -1.9445 | 5.0598 |
| -2.1943 | 5.9616 | -1.7550 | 5.5027 |
| -2.0320 | 6.3701 | -1.5797 | 5.9125 |
| -1.8793 | 6.7381 | -1.4156 | 6.2843 |
| -1.7344 | 7.0633 | -1.2605 | 6.6145 |
| -1.5955 | 7.3436 | -1.1125 | 6.9020 |
| -1.4614 | 7.5762 | -0.9701 | 7.1469 |
| -1.3310 | 7.7591 | -0.8320 | 7.3498 |
| -1.2031 | 7.8918 | -0.6974 | 7.5107 |
| -1.0770 | 7.9742 | -0.5653 | 7.6293 |
| -0.9519 | 8.0079 | -0.4348 | 7.7046 |
| -0.8269 | 7.9952 | -0.3052 | 7.7350 |
| -0.7013 | 7.9383 | -0.1758 | 7.7190 |
| -0.5745 | 7.8395 | -0.0457 | 7.6554 |
| -0.4457 | 7.6999 | 0.0860 | 7.5427 |
| -0.3143 | 7.5199 | 0.2200 | 7.3800 |
| -0.1792 | 7.2976 | 0.3576 | 7.1657 |
| -0.0396 | 7.0304 | 0.4998 | 6.8984 |
| 0.1059 | 6.7140 | 0.6483 | 6.5756 |
| 0.2592 | 6.3427 | 0.8049 | 6.1952 |
| 0.4224 | 5.9117 | 0.9724 | 5.7545 |
| 0.5991 | 5.4152 | 1.1542 | 5.2520 |
| 0.7940 | 4.8497 | 1.3556 | 4.6866 |
| 1.0150 | 4.2124 | 1.5845 | 4.0591 |
| 1.2747 | 3.5036 | 1.8543 | 3.3711 |
| 1.5972 | 2.7248 | 2.1894 | 2.6248 |
| 2.0359 | 1.8793 | 2.6436 | 1.8204 |
| 2.7609 | 0.9705 | 3.3877 | 0.9512 |
| 6.0000 | 0.0403 | 6.0000 | 0.0768 |

Figure 10.A.2 plots TIF by scale score for grade three ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.2. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x‑axis shows corresponding scale score values from 300 to 400 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 303. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.01, where the scale score is 334; or, for the hard pathway, when it reaches its peak at 7.74, where the scale score is 343. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 399.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 334; and among students routed to the hard pathway who have scale scores near 343. The test derives little information for students with scale scores that are either less than 306 or greater than 380.

Figure 10.A. TIF by scale score—ELA, grade three

Table 10.A. ELA, Grade Three Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 303 | 0.3186 | 303 | 0.2534 |
| 303 | 0.9501 | 303 | 0.9237 |
| 303 | 1.8054 | 303 | 1.7134 |
| 303 | 2.5773 | 303 | 2.3999 |
| 303 | 3.2762 | 304 | 3.0112 |
| 303 | 3.9118 | 308 | 3.5700 |
| 306 | 4.4925 | 312 | 4.0929 |
| 310 | 5.0248 | 316 | 4.5889 |
| 312 | 5.5135 | 319 | 5.0598 |
| 315 | 5.9616 | 322 | 5.5027 |
| 318 | 6.3701 | 324 | 5.9125 |
| 320 | 6.7381 | 327 | 6.2843 |
| 322 | 7.0633 | 329 | 6.6145 |
| 324 | 7.3436 | 331 | 6.9020 |
| 326 | 7.5762 | 333 | 7.1469 |
| 328 | 7.7591 | 336 | 7.3498 |
| 330 | 7.8918 | 338 | 7.5107 |
| 332 | 7.9742 | 340 | 7.6293 |
| 334 | 8.0079 | 341 | 7.7046 |
| 336 | 7.9952 | 343 | 7.7350 |
| 337 | 7.9383 | 345 | 7.7190 |
| 339 | 7.8395 | 347 | 7.6554 |
| 341 | 7.6999 | 349 | 7.5427 |
| 343 | 7.5199 | 351 | 7.3800 |
| 345 | 7.2976 | 353 | 7.1657 |
| 347 | 7.0304 | 355 | 6.8984 |
| 350 | 6.7140 | 358 | 6.5756 |
| 352 | 6.3427 | 360 | 6.1952 |
| 354 | 5.9117 | 363 | 5.7545 |
| 357 | 5.4152 | 365 | 5.2520 |
| 360 | 4.8497 | 368 | 4.6866 |
| 363 | 4.2124 | 372 | 4.0591 |
| 367 | 3.5036 | 376 | 3.3711 |
| 372 | 2.7248 | 381 | 2.6248 |
| 379 | 1.8793 | 388 | 1.8204 |
| 389 | 0.9705 | 399 | 0.9512 |
| 399 | 0.0403 | 399 | 0.0768 |

#### TIF for ELA, Grade Four

Figure 10.A.3 plots TIF by theta level for grade four ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.3. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.80, where theta is -0.59; or, for the hard pathway, when it reaches its peak at 8.07, where theta is -0.26. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.59; and among students routed to the hard pathway who have theta scores near -0.26. The test derives little information for students with theta scores that are either less than -4 or greater than 3.

Figure 10.A. TIF by theta—ELA, grade four

Table 10.A. ELA, Grade Four Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.2663 | -6.0000 | 0.1740 |
| -4.6505 | 0.9485 | -4.2063 | 0.9371 |
| -3.9018 | 1.8003 | -3.4455 | 1.7642 |
| -3.4403 | 2.5690 | -2.9733 | 2.5055 |
| -3.0963 | 3.2672 | -2.6202 | 3.1793 |
| -2.8169 | 3.9055 | -2.3329 | 3.7994 |
| -2.5784 | 4.4936 | -2.0879 | 4.3747 |
| -2.3683 | 5.0391 | -1.8722 | 4.9116 |
| -2.1792 | 5.5478 | -1.6783 | 5.4127 |
| -2.0062 | 6.0239 | -1.5010 | 5.8787 |
| -1.8460 | 6.4697 | -1.3368 | 6.3079 |
| -1.6962 | 6.8855 | -1.1830 | 6.6973 |
| -1.5548 | 7.2707 | -1.0373 | 7.0439 |
| -1.4204 | 7.6224 | -0.8983 | 7.3433 |
| -1.2918 | 7.9371 | -0.7643 | 7.5930 |
| -1.1679 | 8.2103 | -0.6343 | 7.7905 |
| -1.0477 | 8.4377 | -0.5071 | 7.9350 |
| -0.9304 | 8.6142 | -0.3817 | 8.0263 |
| -0.8151 | 8.7358 | -0.2574 | 8.0652 |
| -0.7010 | 8.7988 | -0.1333 | 8.0531 |
| -0.5874 | 8.8003 | -0.0086 | 7.9917 |
| -0.4733 | 8.7385 | 0.1174 | 7.8825 |
| -0.3580 | 8.6126 | 0.2456 | 7.7263 |
| -0.2406 | 8.4226 | 0.3768 | 7.5238 |
| -0.1200 | 8.1694 | 0.5120 | 7.2743 |
| 0.0048 | 7.8549 | 0.6523 | 6.9768 |
| 0.1353 | 7.4810 | 0.7994 | 6.6286 |
| 0.2730 | 7.0507 | 0.9550 | 6.2280 |
| 0.4199 | 6.5672 | 1.1218 | 5.7721 |
| 0.5788 | 6.0329 | 1.3032 | 5.2598 |
| 0.7531 | 5.4511 | 1.5044 | 4.6899 |
| 0.9480 | 4.8236 | 1.7332 | 4.0625 |
| 1.1712 | 4.1514 | 2.0026 | 3.3777 |
| 1.4356 | 3.4334 | 2.3367 | 2.6344 |
| 1.7651 | 2.6662 | 2.7890 | 1.8293 |
| 2.2128 | 1.8447 | 3.5294 | 0.9554 |
| 2.9487 | 0.9597 | 6.0000 | 0.0880 |
| 6.0000 | 0.0492 | N/A | N/A |

Figure 10.A.4 plots TIF by scale score for grade four ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.4. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding scale score values from 400 to 500 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 403. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.80, where the scale score is 436; or, for the hard pathway, when it reaches its peak at 8.07, where the scale score is 441. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 499.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 436; and among students routed to the hard pathway who have scale scores near 441. The test derives little information for students with scale scores that are either less than 406 or greater than 475.

Figure 10.A. TIF by scale score—ELA, grade four

Table 10.A. ELA, Grade Four Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 403 | 0.2663 | 403 | 0.1740 |
| 403 | 0.9485 | 403 | 0.9371 |
| 403 | 1.8003 | 403 | 1.7642 |
| 403 | 2.5690 | 403 | 2.5055 |
| 403 | 3.2672 | 406 | 3.1793 |
| 403 | 3.9055 | 410 | 3.7994 |
| 406 | 4.4936 | 414 | 4.3747 |
| 409 | 5.0391 | 417 | 4.9116 |
| 412 | 5.5478 | 420 | 5.4127 |
| 415 | 6.0239 | 422 | 5.8787 |
| 417 | 6.4697 | 425 | 6.3079 |
| 420 | 6.8855 | 427 | 6.6973 |
| 422 | 7.2707 | 429 | 7.0439 |
| 424 | 7.6224 | 432 | 7.3433 |
| 426 | 7.9371 | 434 | 7.5930 |
| 427 | 8.2103 | 435 | 7.7905 |
| 429 | 8.4377 | 437 | 7.9350 |
| 431 | 8.6142 | 439 | 8.0263 |
| 433 | 8.7358 | 441 | 8.0652 |
| 434 | 8.7988 | 443 | 8.0531 |
| 436 | 8.8003 | 445 | 7.9917 |
| 438 | 8.7385 | 447 | 7.8825 |
| 440 | 8.6126 | 449 | 7.7263 |
| 441 | 8.4226 | 451 | 7.5238 |
| 443 | 8.1694 | 453 | 7.2743 |
| 445 | 7.8549 | 455 | 6.9768 |
| 447 | 7.4810 | 457 | 6.6286 |
| 449 | 7.0507 | 459 | 6.2280 |
| 451 | 6.5672 | 462 | 5.7721 |
| 454 | 6.0329 | 465 | 5.2598 |
| 456 | 5.4511 | 468 | 4.6899 |
| 459 | 4.8236 | 471 | 4.0625 |
| 463 | 4.1514 | 475 | 3.3777 |
| 467 | 3.4334 | 480 | 2.6344 |
| 471 | 2.6662 | 487 | 1.8293 |
| 478 | 1.8447 | 498 | 0.9554 |
| 489 | 0.9597 | 499 | 0.0880 |
| 499 | 0.0492 | N/A | N/A |

#### TIF for ELA, Grade Five

Figure 10.A.5 plots TIF by theta level for grade five ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.5. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x‑axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 7.94, where theta is -0.78; or, for the hard pathway, when it reaches its peak at 7.72, where theta is -0.19. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.78; and among students routed to the hard pathway who have theta scores near -0.19. The test derives little information for students with theta scores that are either less than -4 or greater than 2.

Figure 10.A. TIF by theta—ELA, grade five

Table 10.A. ELA, Grade Five Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.4749 | -6.0000 | 0.3291 |
| -5.2523 | 0.9387 | -4.8536 | 0.9061 |
| -4.4924 | 1.7637 | -4.0552 | 1.6520 |
| -4.0190 | 2.4910 | -3.5438 | 2.2788 |
| -3.6624 | 3.1349 | -3.1507 | 2.8209 |
| -3.3697 | 3.7072 | -2.8238 | 3.3060 |
| -3.1171 | 4.2191 | -2.5401 | 3.7553 |
| -2.8922 | 4.6796 | -2.2878 | 4.1831 |
| -2.6875 | 5.0972 | -2.0597 | 4.5978 |
| -2.4982 | 5.4787 | -1.8512 | 5.0025 |
| -2.3213 | 5.8295 | -1.6586 | 5.3971 |
| -2.1542 | 6.1543 | -1.4795 | 5.7776 |
| -1.9955 | 6.4555 | -1.3115 | 6.1395 |
| -1.8438 | 6.7346 | -1.1529 | 6.4767 |
| -1.6980 | 6.9920 | -1.0020 | 6.7837 |
| -1.5573 | 7.2261 | -0.8574 | 7.0549 |
| -1.4208 | 7.4345 | -0.7179 | 7.2853 |
| -1.2878 | 7.6134 | -0.5823 | 7.4704 |
| -1.1576 | 7.7584 | -0.4496 | 7.6062 |
| -1.0296 | 7.8646 | -0.3188 | 7.6891 |
| -0.9029 | 7.9271 | -0.1890 | 7.7155 |
| -0.7768 | 7.9416 | -0.0591 | 7.6824 |
| -0.6506 | 7.9044 | 0.0719 | 7.5870 |
| -0.5233 | 7.8132 | 0.2051 | 7.4269 |
| -0.3941 | 7.6668 | 0.3419 | 7.2009 |
| -0.2619 | 7.4653 | 0.4836 | 6.9093 |
| -0.1256 | 7.2097 | 0.6322 | 6.5534 |
| 0.0162 | 6.9014 | 0.7899 | 6.1363 |
| 0.1650 | 6.5424 | 0.9595 | 5.6624 |
| 0.3229 | 6.1339 | 1.1448 | 5.1365 |
| 0.4923 | 5.6770 | 1.3513 | 4.5625 |
| 0.6768 | 5.1713 | 1.5868 | 3.9436 |
| 0.8814 | 4.6154 | 1.8644 | 3.2792 |
| 1.1137 | 4.0071 | 2.2081 | 2.5650 |
| 1.3864 | 3.3426 | 2.6713 | 1.7916 |
| 1.7233 | 2.6168 | 3.4238 | 0.9440 |
| 2.1778 | 1.8234 | 6.0000 | 0.0801 |
| 2.9196 | 0.9546 | N/A | N/A |
| 6.0000 | 0.0480 | N/A | N/A |

Figure 10.A.6 plots TIF by scale score for grade five ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.6. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x‑axis shows corresponding scale score values from 500 to 600 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 503. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 7.94, where the scale score is 533; or, for the hard pathway, when it reaches its peak at 7.72, where the scale score is 542. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 599.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 533; and among students routed to the hard pathway who have scale scores near 542. The test derives little information for students with scale scores that are either less than 505 or greater than 575.

Figure 10.A. TIF by scale score—ELA, grade five

Table 10.A. ELA, Grade Five Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF-Easy | Scale Score Hard | TIF Hard |
| 503 | 0.4749 | 503 | 0.3291 |
| 503 | 0.9387 | 503 | 0.9061 |
| 503 | 1.7637 | 503 | 1.6520 |
| 503 | 2.4910 | 503 | 2.2788 |
| 503 | 3.1349 | 503 | 2.8209 |
| 503 | 3.7072 | 503 | 3.3060 |
| 503 | 4.2191 | 507 | 3.7553 |
| 503 | 4.6796 | 511 | 4.1831 |
| 505 | 5.0972 | 514 | 4.5978 |
| 508 | 5.4787 | 517 | 5.0025 |
| 510 | 5.8295 | 520 | 5.3971 |
| 513 | 6.1543 | 523 | 5.7776 |
| 515 | 6.4555 | 525 | 6.1395 |
| 517 | 6.7346 | 528 | 6.4767 |
| 520 | 6.9920 | 530 | 6.7837 |
| 522 | 7.2261 | 532 | 7.0549 |
| 524 | 7.4345 | 534 | 7.2853 |
| 526 | 7.6134 | 536 | 7.4704 |
| 528 | 7.7584 | 538 | 7.6062 |
| 530 | 7.8646 | 540 | 7.6891 |
| 531 | 7.9271 | 542 | 7.7155 |
| 533 | 7.9416 | 544 | 7.6824 |
| 535 | 7.9044 | 546 | 7.5870 |
| 537 | 7.8132 | 548 | 7.4269 |
| 539 | 7.6668 | 550 | 7.2009 |
| 541 | 7.4653 | 552 | 6.9093 |
| 543 | 7.2097 | 554 | 6.5534 |
| 545 | 6.9014 | 557 | 6.1363 |
| 547 | 6.5424 | 559 | 5.6624 |
| 550 | 6.1339 | 562 | 5.1365 |
| 552 | 5.6770 | 565 | 4.5625 |
| 555 | 5.1713 | 569 | 3.9436 |
| 558 | 4.6154 | 573 | 3.2792 |
| 562 | 4.0071 | 578 | 2.5650 |
| 566 | 3.3426 | 585 | 1.7916 |
| 571 | 2.6168 | 596 | 0.9440 |
| 578 | 1.8234 | 599 | 0.0801 |
| 589 | 0.9546 | N/A | N/A |
| 599 | 0.0480 | N/A | N/A |

#### TIF for ELA, Grade Six

Figure 10.A.7 plots TIF by theta level for grade six ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.7. The graph’s y-axis shows the TIF values from 0 to 12 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 9.53, where theta is -0.97; or, for the hard pathway, when it reaches its peak at 8.61, where theta is -0.50. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.97; and among students routed to the hard pathway who have theta scores near -0.50. The test derives little information for students with theta scores that are either less than -4 or greater than 2.

Figure 10.A. TIF by theta—ELA, grade six

Table 10.A. ELA, Grade Six Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.2363 | -6.0000 | 0.1797 |
| -4.5306 | 0.9544 | -4.2388 | 0.9381 |
| -3.7901 | 1.8332 | -3.4821 | 1.7857 |
| -3.3401 | 2.6580 | -3.0192 | 2.5805 |
| -3.0105 | 3.4431 | -2.6796 | 3.3391 |
| -2.7478 | 4.1956 | -2.4086 | 4.0644 |
| -2.5278 | 4.9174 | -2.1812 | 4.7502 |
| -2.3375 | 5.6059 | -1.9837 | 5.3874 |
| -2.1687 | 6.2565 | -1.8074 | 5.9694 |
| -2.0161 | 6.8628 | -1.6469 | 6.4916 |
| -1.8760 | 7.4181 | -1.4980 | 6.9538 |
| -1.7455 | 7.9169 | -1.3582 | 7.3563 |
| -1.6225 | 8.3542 | -1.2254 | 7.7010 |
| -1.5054 | 8.7257 | -1.0979 | 7.9897 |
| -1.3927 | 9.0289 | -0.9745 | 8.2230 |
| -1.2834 | 9.2614 | -0.8541 | 8.4011 |
| -1.1763 | 9.4223 | -0.7359 | 8.5239 |
| -1.0706 | 9.5111 | -0.6190 | 8.5917 |
| -0.9656 | 9.5281 | -0.5027 | 8.6054 |
| -0.8603 | 9.4746 | -0.3862 | 8.5672 |
| -0.7541 | 9.3529 | -0.2689 | 8.4805 |
| -0.6460 | 9.1657 | -0.1500 | 8.3497 |
| -0.5354 | 8.9173 | -0.0289 | 8.1800 |
| -0.4213 | 8.6123 | 0.0949 | 7.9766 |
| -0.3026 | 8.2555 | 0.2222 | 7.7436 |
| -0.1784 | 7.8530 | 0.3536 | 7.4837 |
| -0.0473 | 7.4098 | 0.4899 | 7.1972 |
| 0.0923 | 6.9303 | 0.6321 | 6.8817 |
| 0.2422 | 6.4185 | 0.7813 | 6.5324 |
| 0.4051 | 5.8756 | 0.9391 | 6.1432 |
| 0.5842 | 5.3022 | 1.1080 | 5.7062 |
| 0.7845 | 4.6958 | 1.2912 | 5.2150 |
| 1.0136 | 4.0520 | 1.4938 | 4.6639 |
| 1.2839 | 3.3650 | 1.7236 | 4.0500 |
| 1.6192 | 2.6263 | 1.9937 | 3.3720 |
| 2.0725 | 1.8267 | 2.3283 | 2.6307 |
| 2.8134 | 0.9553 | 2.7812 | 1.8260 |
| 6.0000 | 0.0431 | 3.5232 | 0.9534 |
| N/A | N/A | 6.0000 | 0.0876 |

Figure 10.A.8 plots TIF by scale score for grade six ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.8. The graph’s y-axis shows the TIF values from 0 to 12 in intervals of 1, and its x-axis shows corresponding scale score values from 600 to 700 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 603. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 9.53, where the scale score is 633; or, for the hard pathway, when it reaches its peak at 8.61, where the scale score is 639. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 699.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 633; and among students routed to the hard pathway who have scale scores near 639. The test derives little information for students with scale scores that are either less than 607 or greater than 670.

Figure 10.A. TIF by scale score—ELA, grade six

Table 10.A. ELA, Grade Six Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 603 | 0.2363 | 603 | 0.1797 |
| 603 | 0.9544 | 603 | 0.9381 |
| 603 | 1.8332 | 603 | 1.7857 |
| 603 | 2.6580 | 607 | 2.5805 |
| 607 | 3.4431 | 612 | 3.3391 |
| 611 | 4.1956 | 615 | 4.0644 |
| 613 | 4.9174 | 618 | 4.7502 |
| 616 | 5.6059 | 620 | 5.3874 |
| 618 | 6.2565 | 622 | 5.9694 |
| 620 | 6.8628 | 624 | 6.4916 |
| 622 | 7.4181 | 626 | 6.9538 |
| 623 | 7.9169 | 628 | 7.3563 |
| 625 | 8.3542 | 630 | 7.7010 |
| 626 | 8.7257 | 631 | 7.9897 |
| 628 | 9.0289 | 633 | 8.2230 |
| 629 | 9.2614 | 634 | 8.4011 |
| 630 | 9.4223 | 636 | 8.5239 |
| 632 | 9.5111 | 637 | 8.5917 |
| 633 | 9.5281 | 639 | 8.6054 |
| 634 | 9.4746 | 640 | 8.5672 |
| 636 | 9.3529 | 642 | 8.4805 |
| 637 | 9.1657 | 643 | 8.3497 |
| 638 | 8.9173 | 645 | 8.1800 |
| 640 | 8.6123 | 646 | 7.9766 |
| 641 | 8.2555 | 648 | 7.7436 |
| 643 | 7.8530 | 649 | 7.4837 |
| 644 | 7.4098 | 651 | 7.1972 |
| 646 | 6.9303 | 653 | 6.8817 |
| 648 | 6.4185 | 655 | 6.5324 |
| 650 | 5.8756 | 657 | 6.1432 |
| 652 | 5.3022 | 659 | 5.7062 |
| 655 | 4.6958 | 661 | 5.2150 |
| 658 | 4.0520 | 664 | 4.6639 |
| 661 | 3.3650 | 667 | 4.0500 |
| 665 | 2.6263 | 670 | 3.3720 |
| 671 | 1.8267 | 674 | 2.6307 |
| 680 | 0.9553 | 680 | 1.8260 |
| 699 | 0.0431 | 689 | 0.9534 |
| N/A | N/A | 699 | 0.0876 |

#### TIF for ELA, Grade Seven

Figure 10.A.9 plots TIF by theta level for grade seven ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.9. The graph’s y-axis shows the TIF values from 0 to 8 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 7.23, where theta is -0.56; or, for the hard pathway, when it reaches its peak at 7.17, where theta is 0.26. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.56; and among students routed to the hard pathway who have theta scores near 0.26. The test derives little information for students with theta scores that are either less than -4 or greater than 3.

Figure 10.A. TIF by theta—ELA, grade seven

Table 10.A. ELA, Grade Seven Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.3041 | -6.0000 | 0.2201 |
| -4.7776 | 0.9249 | -4.4149 | 0.8875 |
| -4.0028 | 1.7219 | -3.5958 | 1.6040 |
| -3.5166 | 2.4194 | -3.0687 | 2.2112 |
| -3.1490 | 3.0370 | -2.6643 | 2.7474 |
| -2.8467 | 3.5890 | -2.3294 | 3.2363 |
| -2.5858 | 4.0863 | -2.0403 | 3.6916 |
| -2.3537 | 4.5369 | -1.7839 | 4.1215 |
| -2.1427 | 4.9477 | -1.5525 | 4.5291 |
| -1.9478 | 5.3238 | -1.3405 | 4.9159 |
| -1.7657 | 5.6686 | -1.1442 | 5.2813 |
| -1.5940 | 5.9841 | -0.9607 | 5.6234 |
| -1.4307 | 6.2711 | -0.7876 | 5.9401 |
| -1.2744 | 6.5282 | -0.6232 | 6.2284 |
| -1.1237 | 6.7530 | -0.4658 | 6.4855 |
| -0.9776 | 6.9413 | -0.3141 | 6.7078 |
| -0.8350 | 7.0879 | -0.1670 | 6.8915 |
| -0.6949 | 7.1874 | -0.0233 | 7.0325 |
| -0.5562 | 7.2346 | 0.1179 | 7.1262 |
| -0.4179 | 7.2249 | 0.2579 | 7.1681 |
| -0.2788 | 7.1553 | 0.3975 | 7.1531 |
| -0.1377 | 7.0242 | 0.5381 | 7.0763 |
| 0.0066 | 6.8320 | 0.6809 | 6.9333 |
| 0.1558 | 6.5799 | 0.8273 | 6.7207 |
| 0.3115 | 6.2703 | 0.9794 | 6.4358 |
| 0.4758 | 5.9058 | 1.1392 | 6.0783 |
| 0.6514 | 5.4881 | 1.3098 | 5.6491 |
| 0.8419 | 5.0180 | 1.4950 | 5.1512 |
| 1.0523 | 4.4951 | 1.7005 | 4.5887 |
| 1.2903 | 3.9171 | 1.9347 | 3.9664 |
| 1.5688 | 3.2799 | 2.2110 | 3.2898 |
| 1.9114 | 2.5782 | 2.5543 | 2.5617 |
| 2.3716 | 1.8045 | 3.0193 | 1.7807 |
| 3.1192 | 0.9493 | 3.7775 | 0.9367 |
| 6.0000 | 0.0588 | 6.0000 | 0.1145 |

Figure 10.A.10 plots TIF by scale score for grade seven ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.10. The graph’s y-axis shows the TIF values from 0 to 8 in intervals of 1, and its x-axis shows corresponding scale score values from 700 to 800 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 703. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 7.23, where the scale score is 737; or, for the hard pathway, when it reaches its peak at 7.17, where the scale score is 749. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 799.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 737; and among students routed to the hard pathway who have scale scores near 749. The test derives little information for students with scale scores that are either less than 706 or greater than 774.

Figure 10.A. TIF by scale score—ELA, grade seven

Table 10.A. ELA, Grade Seven Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 703 | 0.3041 | 703 | 0.2201 |
| 703 | 0.9249 | 703 | 0.8875 |
| 703 | 1.7219 | 703 | 1.6040 |
| 703 | 2.4194 | 703 | 2.2112 |
| 703 | 3.0370 | 705 | 2.7474 |
| 703 | 3.5890 | 710 | 3.2363 |
| 706 | 4.0863 | 714 | 3.6916 |
| 710 | 4.5369 | 718 | 4.1215 |
| 713 | 4.9477 | 722 | 4.5291 |
| 716 | 5.3238 | 725 | 4.9159 |
| 719 | 5.6686 | 728 | 5.2813 |
| 721 | 5.9841 | 731 | 5.6234 |
| 724 | 6.2711 | 733 | 5.9401 |
| 726 | 6.5282 | 736 | 6.2284 |
| 728 | 6.7530 | 738 | 6.4855 |
| 730 | 6.9413 | 740 | 6.7078 |
| 732 | 7.0879 | 742 | 6.8915 |
| 735 | 7.1874 | 745 | 7.0325 |
| 737 | 7.2346 | 747 | 7.1262 |
| 739 | 7.2249 | 749 | 7.1681 |
| 741 | 7.1553 | 751 | 7.1531 |
| 743 | 7.0242 | 753 | 7.0763 |
| 745 | 6.8320 | 755 | 6.9333 |
| 747 | 6.5799 | 757 | 6.7207 |
| 750 | 6.2703 | 760 | 6.4358 |
| 752 | 5.9058 | 762 | 6.0783 |
| 755 | 5.4881 | 765 | 5.6491 |
| 758 | 5.0180 | 767 | 5.1512 |
| 761 | 4.4951 | 771 | 4.5887 |
| 764 | 3.9171 | 774 | 3.9664 |
| 769 | 3.2799 | 778 | 3.2898 |
| 774 | 2.5782 | 783 | 2.5617 |
| 781 | 1.8045 | 790 | 1.7807 |
| 792 | 0.9493 | 799 | 0.9367 |
| 799 | 0.0588 | 799 | 0.1145 |

#### TIF for ELA, Grade Eight

Figure 10.A.11 plots TIF by theta level for grade eight ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.11. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.37, where theta is -0.37; or, for the hard pathway, when it reaches its peak at 7.90, where theta is 0.01. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.37; and among students routed to the hard pathway who have theta scores near 0.01. The test derives little information for students with theta scores that are either less than -4 or greater than 3.

Figure 10.A. TIF by theta—ELA, grade eight

Table 10.A. ELA, Grade Eight Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.3274 | -6.0000 | 0.2628 |
| -4.8634 | 0.9472 | -4.6162 | 0.9097 |
| -4.1127 | 1.7925 | -3.8227 | 1.6666 |
| -3.6482 | 2.5452 | -3.3168 | 2.3077 |
| -3.2999 | 3.2154 | -2.9290 | 2.8618 |
| -3.0149 | 3.8117 | -2.6067 | 3.3517 |
| -2.7694 | 4.3432 | -2.3266 | 3.7969 |
| -2.5509 | 4.8183 | -2.0766 | 4.2129 |
| -2.3520 | 5.2447 | -1.8497 | 4.6114 |
| -2.1680 | 5.6298 | -1.6414 | 5.0004 |
| -1.9956 | 5.9803 | -1.4485 | 5.3842 |
| -1.8327 | 6.3016 | -1.2689 | 5.7626 |
| -1.6776 | 6.5988 | -1.1006 | 6.1325 |
| -1.5290 | 6.8755 | -0.9420 | 6.4876 |
| -1.3862 | 7.1337 | -0.7916 | 6.8200 |
| -1.2482 | 7.3745 | -0.6481 | 7.1206 |
| -1.1145 | 7.5972 | -0.5101 | 7.3812 |
| -0.9846 | 7.7997 | -0.3765 | 7.5940 |
| -0.8577 | 7.9790 | -0.2462 | 7.7531 |
| -0.7335 | 8.1304 | -0.1180 | 7.8546 |
| -0.6114 | 8.2490 | 0.0090 | 7.8964 |
| -0.4907 | 8.3298 | 0.1358 | 7.8785 |
| -0.3709 | 8.3674 | 0.2633 | 7.8024 |
| -0.2513 | 8.3574 | 0.3926 | 7.6709 |
| -0.1311 | 8.2961 | 0.5246 | 7.4878 |
| -0.0097 | 8.1807 | 0.6603 | 7.2571 |
| 0.1138 | 8.0098 | 0.8008 | 6.9828 |
| 0.2405 | 7.7825 | 0.9474 | 6.6680 |
| 0.3714 | 7.4993 | 1.1015 | 6.3150 |
| 0.5079 | 7.1609 | 1.2650 | 5.9239 |
| 0.6515 | 6.7690 | 1.4403 | 5.4933 |
| 0.8043 | 6.3252 | 1.6307 | 5.0202 |
| 0.9690 | 5.8311 | 1.8409 | 4.5000 |
| 1.1490 | 5.2887 | 2.0786 | 3.9262 |
| 1.3495 | 4.6986 | 2.3562 | 3.2924 |
| 1.5782 | 4.0605 | 2.6973 | 2.5909 |
| 1.8479 | 3.3727 | 3.1551 | 1.8138 |
| 2.1825 | 2.6307 | 3.8994 | 0.9528 |
| 2.6352 | 1.8282 | 6.0000 | 0.1271 |
| 3.3758 | 0.9554 | N/A | N/A |
| 6.0000 | 0.0755 | N/A | N/A |

Figure 10.A.12 plots TIF by scale score for grade eight ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.12. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding scale score values from 800 to 900 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 803. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.37, where the scale score is 843; or, for the hard pathway, when it reaches its peak at 7.90, where the scale score is 848. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 899.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 843; and among students routed to the hard pathway who have scale scores near 848. The test derives little information for students with scale scores that are either less than 806 or greater than 875.

Figure 10.A. TIF by scale score—ELA, grade eight

Table 10.A. ELA, Grade Eight Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 803 | 0.3274 | 803 | 0.2628 |
| 803 | 0.9472 | 803 | 0.9097 |
| 803 | 1.7925 | 803 | 1.6666 |
| 803 | 2.5452 | 806 | 2.3077 |
| 806 | 3.2154 | 811 | 2.8618 |
| 810 | 3.8117 | 815 | 3.3517 |
| 813 | 4.3432 | 818 | 3.7969 |
| 816 | 4.8183 | 822 | 4.2129 |
| 818 | 5.2447 | 824 | 4.6114 |
| 820 | 5.6298 | 827 | 5.0004 |
| 823 | 5.9803 | 829 | 5.3842 |
| 825 | 6.3016 | 832 | 5.7626 |
| 827 | 6.5988 | 834 | 6.1325 |
| 828 | 6.8755 | 836 | 6.4876 |
| 830 | 7.1337 | 838 | 6.8200 |
| 832 | 7.3745 | 839 | 7.1206 |
| 834 | 7.5972 | 841 | 7.3812 |
| 835 | 7.7997 | 843 | 7.5940 |
| 837 | 7.9790 | 844 | 7.7531 |
| 838 | 8.1304 | 846 | 7.8546 |
| 840 | 8.2490 | 848 | 7.8964 |
| 841 | 8.3298 | 849 | 7.8785 |
| 843 | 8.3674 | 851 | 7.8024 |
| 844 | 8.3574 | 852 | 7.6709 |
| 846 | 8.2961 | 854 | 7.4878 |
| 847 | 8.1807 | 856 | 7.2571 |
| 849 | 8.0098 | 858 | 6.9828 |
| 851 | 7.7825 | 859 | 6.6680 |
| 852 | 7.4993 | 861 | 6.3150 |
| 854 | 7.1609 | 863 | 5.9239 |
| 856 | 6.7690 | 866 | 5.4933 |
| 858 | 6.3252 | 868 | 5.0202 |
| 860 | 5.8311 | 871 | 4.5000 |
| 862 | 5.2887 | 873 | 3.9262 |
| 864 | 4.6986 | 877 | 3.2924 |
| 867 | 4.0605 | 881 | 2.5909 |
| 871 | 3.3727 | 887 | 1.8138 |
| 875 | 2.6307 | 896 | 0.9528 |
| 880 | 1.8282 | 899 | 0.1271 |
| 890 | 0.9554 | N/A | N/A |
| 899 | 0.0755 | N/A | N/A |

#### TIF for ELA, Grade Eleven

Figure 10.A.13 plots TIF by theta level for grade eleven ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.13. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 7.85, where theta is -0.32; or, for the hard pathway, when it reaches its peak at 7.57, where theta is 0.27. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.32; and among students routed to the hard pathway who have theta scores near 0.27. The test derives little information for students with theta scores that are either less than -4 or greater than 4.

Figure 10.A. TIF by theta—ELA, grade eleven

Table 10.A. ELA, Grade Eleven Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.2339 | -6.0000 | 0.2009 |
| -4.5099 | 0.9362 | -4.3480 | 0.9283 |
| -3.7473 | 1.7567 | -3.5769 | 1.7325 |
| -3.2720 | 2.4810 | -3.0941 | 2.4381 |
| -2.9142 | 3.1253 | -2.7295 | 3.0632 |
| -2.6208 | 3.7036 | -2.4298 | 3.6201 |
| -2.3683 | 4.2273 | -2.1711 | 4.1174 |
| -2.1442 | 4.7064 | -1.9405 | 4.5618 |
| -1.9411 | 5.1486 | -1.7303 | 4.9589 |
| -1.7542 | 5.5598 | -1.5355 | 5.3140 |
| -1.5802 | 5.9436 | -1.3527 | 5.6322 |
| -1.4167 | 6.3015 | -1.1794 | 5.9190 |
| -1.2620 | 6.6323 | -1.0140 | 6.1797 |
| -1.1145 | 6.9335 | -0.8552 | 6.4190 |
| -0.9729 | 7.2007 | -0.7019 | 6.6409 |
| -0.8362 | 7.4285 | -0.5536 | 6.8469 |
| -0.7032 | 7.6117 | -0.4094 | 7.0372 |
| -0.5729 | 7.7450 | -0.2689 | 7.2087 |
| -0.4444 | 7.8239 | -0.1316 | 7.3556 |
| -0.3167 | 7.8453 | 0.0034 | 7.4705 |
| -0.1889 | 7.8073 | 0.1366 | 7.5440 |
| -0.0600 | 7.7094 | 0.2690 | 7.5670 |
| 0.0710 | 7.5525 | 0.4015 | 7.5309 |
| 0.2054 | 7.3382 | 0.5352 | 7.4291 |
| 0.3442 | 7.0696 | 0.6714 | 7.2581 |
| 0.4890 | 6.7494 | 0.8115 | 7.0174 |
| 0.6414 | 6.3812 | 0.9572 | 6.7099 |
| 0.8034 | 5.9680 | 1.1105 | 6.3410 |
| 0.9778 | 5.5116 | 1.2737 | 5.9183 |
| 1.1680 | 5.0132 | 1.4498 | 5.4491 |
| 1.3790 | 4.4722 | 1.6425 | 4.9401 |
| 1.6187 | 3.8853 | 1.8570 | 4.3948 |
| 1.8997 | 3.2480 | 2.1011 | 3.8126 |
| 2.2458 | 2.5527 | 2.3874 | 3.1881 |
| 2.7103 | 1.7893 | 2.7396 | 2.5113 |
| 3.4629 | 0.9444 | 3.2108 | 1.7675 |
| 6.0000 | 0.0832 | 3.9706 | 0.9381 |
| N/A | N/A | 6.0000 | 0.1380 |

Figure 10.A.14 plots TIF by scale score for grade eleven ELA for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.14. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding scale score values from 900 to 1000 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 903. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 7.85, where the scale score is 944; or, for the hard pathway, when it reaches its peak at 7.57, where the scale score is 951. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero where the scale score reaches its maximum of 999.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 944; and among students routed to the hard pathway who have scale scores near 951. The test derives little information for students with scale scores that are either less than 907 or greater than 980.

Figure 10.A. TIF by scale score—ELA, grade eleven

Table 10.A. ELA, Grade Eleven Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 903 | 0.2339 | 903 | 0.2009 |
| 903 | 0.9362 | 903 | 0.9283 |
| 903 | 1.7567 | 903 | 1.7325 |
| 907 | 2.4810 | 909 | 2.4381 |
| 911 | 3.1253 | 913 | 3.0632 |
| 915 | 3.7036 | 917 | 3.6201 |
| 918 | 4.2273 | 920 | 4.1174 |
| 921 | 4.7064 | 923 | 4.5618 |
| 923 | 5.1486 | 926 | 4.9589 |
| 926 | 5.5598 | 928 | 5.3140 |
| 928 | 5.9436 | 931 | 5.6322 |
| 930 | 6.3015 | 933 | 5.9190 |
| 932 | 6.6323 | 935 | 6.1797 |
| 934 | 6.9335 | 937 | 6.4190 |
| 935 | 7.2007 | 939 | 6.6409 |
| 937 | 7.4285 | 941 | 6.8469 |
| 939 | 7.6117 | 942 | 7.0372 |
| 940 | 7.7450 | 944 | 7.2087 |
| 942 | 7.8239 | 946 | 7.3556 |
| 944 | 7.8453 | 948 | 7.4705 |
| 945 | 7.8073 | 949 | 7.5440 |
| 947 | 7.7094 | 951 | 7.5670 |
| 948 | 7.5525 | 953 | 7.5309 |
| 950 | 7.3382 | 954 | 7.4291 |
| 952 | 7.0696 | 956 | 7.2581 |
| 954 | 6.7494 | 958 | 7.0174 |
| 956 | 6.3812 | 959 | 6.7099 |
| 958 | 5.9680 | 961 | 6.3410 |
| 960 | 5.5116 | 963 | 5.9183 |
| 962 | 5.0132 | 966 | 5.4491 |
| 965 | 4.4722 | 968 | 4.9401 |
| 968 | 3.8853 | 971 | 4.3948 |
| 971 | 3.2480 | 974 | 3.8126 |
| 976 | 2.5527 | 977 | 3.1881 |
| 981 | 1.7893 | 982 | 2.5113 |
| 991 | 0.9444 | 988 | 1.7675 |
| 999 | 0.0832 | 997 | 0.9381 |
| N/A | N/A | 999 | 0.1380 |

#### TIF for Mathematics, Grade Three

Figure 10.A.15 plots TIF by theta level for grade three mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.15. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 7.68, where theta is 0.02; or, for the hard pathway, when it reaches its peak at 7.26, where theta is 0.41. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near 0.02; and among students routed to the hard pathway who have theta scores near 0.41. The test derives little information for students with theta scores that are either less than -4 or greater than 4.

Figure 10.A. TIF by theta—mathematics, grade three

Table 10.A. Mathematics, Grade Three Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.1033 | -6.0000 | 0.0822 |
| -3.6949 | 0.9588 | -3.4546 | 0.9481 |
| -2.9574 | 1.8363 | -2.7054 | 1.7980 |
| -2.5064 | 2.6382 | -2.2429 | 2.5613 |
| -2.1722 | 3.3691 | -1.8974 | 3.2475 |
| -1.9015 | 4.0330 | -1.6157 | 3.8644 |
| -1.6704 | 4.6337 | -1.3740 | 4.4186 |
| -1.4663 | 5.1735 | -1.1596 | 4.9155 |
| -1.2815 | 5.6553 | -0.9648 | 5.3592 |
| -1.1110 | 6.0811 | -0.7847 | 5.7531 |
| -0.9514 | 6.4529 | -0.6159 | 6.0995 |
| -0.8001 | 6.7727 | -0.4559 | 6.4001 |
| -0.6553 | 7.0420 | -0.3026 | 6.6563 |
| -0.5155 | 7.2626 | -0.1547 | 6.8682 |
| -0.3794 | 7.4360 | -0.0108 | 7.0359 |
| -0.2460 | 7.5636 | 0.1301 | 7.1584 |
| -0.1144 | 7.6463 | 0.2691 | 7.2347 |
| 0.0160 | 7.6847 | 0.4071 | 7.2631 |
| 0.1463 | 7.6790 | 0.5450 | 7.2418 |
| 0.2770 | 7.6285 | 0.6838 | 7.1687 |
| 0.4089 | 7.5318 | 0.8246 | 7.0415 |
| 0.5430 | 7.3865 | 0.9685 | 6.8581 |
| 0.6803 | 7.1894 | 1.1169 | 6.6168 |
| 0.8219 | 6.9368 | 1.2716 | 6.3158 |
| 0.9694 | 6.6250 | 1.4346 | 5.9543 |
| 1.1247 | 6.2507 | 1.6088 | 5.5316 |
| 1.2906 | 5.8109 | 1.7980 | 5.0480 |
| 1.4706 | 5.3050 | 2.0075 | 4.5048 |
| 1.6700 | 4.7335 | 2.2457 | 3.9033 |
| 1.8967 | 4.0986 | 2.5261 | 3.2457 |
| 2.1640 | 3.4026 | 2.8736 | 2.5336 |
| 2.4960 | 2.6480 | 3.3432 | 1.7654 |
| 2.9465 | 1.8342 | 4.1068 | 0.9315 |
| 3.6859 | 0.9559 | 6.0000 | 0.1588 |
| 6.0000 | 0.1027 | N/A | N/A |

Figure 10.A.16 plots TIF by scale score for grade three mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.16. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding scale score values from 300 to 400 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 303. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 7.68, where the scale score is 342; or, for the hard pathway, when it reaches its peak at 7.26, where the scale score is 349. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 399.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 342; and among students routed to the hard pathway who have scale scores near 349. The test derives little information for students with scale scores that are either less than 306 or greater than 380.

Figure 10.A. TIF by scale score—mathematics, grade three

Table 10.A. Mathematics, Grade Three Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 303 | 0.1033 | 303 | 0.0822 |
| 303 | 0.9588 | 303 | 0.9481 |
| 303 | 1.8363 | 303 | 1.7980 |
| 303 | 2.6382 | 303 | 2.5613 |
| 303 | 3.3691 | 306 | 3.2475 |
| 306 | 4.0330 | 311 | 3.8644 |
| 310 | 4.6337 | 316 | 4.4186 |
| 314 | 5.1735 | 320 | 4.9155 |
| 317 | 5.6553 | 323 | 5.3592 |
| 320 | 6.0811 | 327 | 5.7531 |
| 323 | 6.4529 | 330 | 6.0995 |
| 326 | 6.7727 | 333 | 6.4001 |
| 329 | 7.0420 | 336 | 6.6563 |
| 332 | 7.2626 | 338 | 6.8682 |
| 334 | 7.4360 | 341 | 7.0359 |
| 337 | 7.5636 | 344 | 7.1584 |
| 339 | 7.6463 | 346 | 7.2347 |
| 342 | 7.6847 | 349 | 7.2631 |
| 344 | 7.6790 | 352 | 7.2418 |
| 346 | 7.6285 | 354 | 7.1687 |
| 349 | 7.5318 | 357 | 7.0415 |
| 351 | 7.3865 | 359 | 6.8581 |
| 354 | 7.1894 | 362 | 6.6168 |
| 357 | 6.9368 | 365 | 6.3158 |
| 359 | 6.6250 | 368 | 5.9543 |
| 362 | 6.2507 | 371 | 5.5316 |
| 365 | 5.8109 | 375 | 5.0480 |
| 369 | 5.3050 | 379 | 4.5048 |
| 373 | 4.7335 | 383 | 3.9033 |
| 377 | 4.0986 | 389 | 3.2457 |
| 382 | 3.4026 | 395 | 2.5336 |
| 388 | 2.6480 | 399 | 1.7654 |
| 397 | 1.8342 | 399 | 0.9315 |
| 399 | 0.9559 | 399 | 0.1588 |
| 399 | 0.1027 | N/A | N/A |

#### TIF for Mathematics, Grade Four

Figure 10.A.17 plots TIF by theta level for grade four mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.17. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 9.11, where theta is -0.21; or, for the hard pathway when it reaches its peak at 8.43, where theta is 0.19. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.21; and among students routed to the hard pathway who have theta scores near 0.19. The test derives little information for students with theta scores that are either less than -4 or greater than 3.

Figure 10.A. TIF by theta—mathematics, grade four

Table 10.A. Mathematics, Grade Four Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.2267 | -6.0000 | 0.1600 |
| -4.4628 | 0.9128 | -4.0606 | 0.8659 |
| -3.6743 | 1.6844 | -3.2154 | 1.5465 |
| -3.1764 | 2.3616 | -2.6698 | 2.1492 |
| -2.8005 | 2.9800 | -2.2583 | 2.7390 |
| -2.4941 | 3.5645 | -1.9279 | 3.3415 |
| -2.2336 | 4.1306 | -1.6529 | 3.9562 |
| -2.0063 | 4.6855 | -1.4178 | 4.5701 |
| -1.8043 | 5.2307 | -1.2121 | 5.1674 |
| -1.6221 | 5.7635 | -1.0284 | 5.7339 |
| -1.4558 | 6.2787 | -0.8615 | 6.2581 |
| -1.3024 | 6.7697 | -0.7075 | 6.7325 |
| -1.1595 | 7.2293 | -0.5634 | 7.1529 |
| -1.0250 | 7.6511 | -0.4270 | 7.5165 |
| -0.8974 | 8.0284 | -0.2966 | 7.8219 |
| -0.7753 | 8.3557 | -0.1707 | 8.0679 |
| -0.6575 | 8.6284 | -0.0481 | 8.2531 |
| -0.5430 | 8.8428 | 0.0722 | 8.3757 |
| -0.4308 | 8.9960 | 0.1912 | 8.4337 |
| -0.3202 | 9.0858 | 0.3098 | 8.4249 |
| -0.2103 | 9.1107 | 0.4291 | 8.3474 |
| -0.1002 | 9.0696 | 0.5500 | 8.1997 |
| 0.0107 | 8.9622 | 0.6736 | 7.9814 |
| 0.1234 | 8.7879 | 0.8012 | 7.6931 |
| 0.2388 | 8.5470 | 0.9343 | 7.3366 |
| 0.3580 | 8.2398 | 1.0747 | 6.9151 |
| 0.4822 | 7.8671 | 1.2246 | 6.4334 |
| 0.6130 | 7.4300 | 1.3869 | 5.8970 |
| 0.7523 | 6.9303 | 1.5655 | 5.3118 |
| 0.9028 | 6.3695 | 1.7659 | 4.6836 |
| 1.0679 | 5.7506 | 1.9962 | 4.0172 |
| 1.2529 | 5.0759 | 2.2698 | 3.3145 |
| 1.4655 | 4.3491 | 2.6112 | 2.5736 |
| 1.7187 | 3.5734 | 3.0743 | 1.7874 |
| 2.0365 | 2.7516 | 3.8298 | 0.9398 |
| 2.4727 | 1.8843 | 6.0000 | 0.1202 |
| 3.1975 | 0.9696 | N/A | N/A |
| 6.0000 | 0.0624 | N/A | N/A |

Figure 10.A.18 plots TIF by scale score for grade four mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.18. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding scale score values from 400 to 500 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 403. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 9.11, where the scale score is 437; or, for the hard pathway, when it reaches its peak at 8.43, where the scale score is 445. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 499.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 437; and among students routed to the hard pathway who have scale scores near 445. The test derives little information for students with scale scores that are either less than 404 or greater than 474.

Figure 10.A. TIF by scale score—mathematics, grade four

Table 10.A. Mathematics, Grade Four Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 403 | 0.2267 | 403 | 0.1600 |
| 403 | 0.9128 | 403 | 0.8659 |
| 403 | 1.6844 | 403 | 1.5465 |
| 403 | 2.3616 | 403 | 2.1492 |
| 403 | 2.9800 | 403 | 2.7390 |
| 403 | 3.5645 | 405 | 3.3415 |
| 403 | 4.1306 | 410 | 3.9562 |
| 404 | 4.6855 | 415 | 4.5701 |
| 407 | 5.2307 | 419 | 5.1674 |
| 411 | 5.7635 | 422 | 5.7339 |
| 414 | 6.2787 | 425 | 6.2581 |
| 417 | 6.7697 | 428 | 6.7325 |
| 420 | 7.2293 | 431 | 7.1529 |
| 422 | 7.6511 | 433 | 7.5165 |
| 424 | 8.0284 | 436 | 7.8219 |
| 427 | 8.3557 | 438 | 8.0679 |
| 429 | 8.6284 | 440 | 8.2531 |
| 431 | 8.8428 | 443 | 8.3757 |
| 433 | 8.9960 | 445 | 8.4337 |
| 435 | 9.0858 | 447 | 8.4249 |
| 437 | 9.1107 | 449 | 8.3474 |
| 439 | 9.0696 | 452 | 8.1997 |
| 442 | 8.9622 | 454 | 7.9814 |
| 444 | 8.7879 | 456 | 7.6931 |
| 446 | 8.5470 | 459 | 7.3366 |
| 448 | 8.2398 | 461 | 6.9151 |
| 450 | 7.8671 | 464 | 6.4334 |
| 453 | 7.4300 | 467 | 5.8970 |
| 455 | 6.9303 | 471 | 5.3118 |
| 458 | 6.3695 | 474 | 4.6836 |
| 461 | 5.7506 | 479 | 4.0172 |
| 465 | 5.0759 | 484 | 3.3145 |
| 469 | 4.3491 | 490 | 2.5736 |
| 474 | 3.5734 | 499 | 1.7874 |
| 479 | 2.7516 | 499 | 0.9398 |
| 488 | 1.8843 | 499 | 0.1202 |
| 499 | 0.9696 | N/A | N/A |
| 499 | 0.0624 | N/A | N/A |

#### TIF for Mathematics, Grade Five

Figure 10.A.19 plots TIF by theta level for grade five mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.19. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.37, where theta is -0.25; or, for the hard pathway, when it reaches its peak at 7.58, where theta is 0.39. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.25; and among students routed to the hard pathway who have theta scores near 0.39. The test derives little information for students with theta scores that are either less than -4 or greater than 3.

Figure 10.A. TIF by theta—mathematics, grade five

Table 10.A. Mathematics, Grade Five Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.1339 | -6.0000 | 0.1017 |
| -3.9600 | 0.9632 | -3.6739 | 0.9532 |
| -3.2276 | 1.8549 | -2.9305 | 1.8179 |
| -2.7823 | 2.6807 | -2.4741 | 2.6017 |
| -2.4544 | 3.4435 | -2.1346 | 3.3094 |
| -2.1902 | 4.1464 | -1.8584 | 3.9450 |
| -1.9661 | 4.7903 | -1.6217 | 4.5121 |
| -1.7692 | 5.3768 | -1.4117 | 5.0153 |
| -1.5918 | 5.9072 | -1.2206 | 5.4598 |
| -1.4290 | 6.3826 | -1.0437 | 5.8505 |
| -1.2773 | 6.8043 | -0.8776 | 6.1926 |
| -1.1341 | 7.1740 | -0.7199 | 6.4909 |
| -0.9977 | 7.4923 | -0.5687 | 6.7497 |
| -0.8666 | 7.7604 | -0.4229 | 6.9717 |
| -0.7395 | 7.9794 | -0.2813 | 7.1595 |
| -0.6154 | 8.1500 | -0.1431 | 7.3142 |
| -0.4936 | 8.2725 | -0.0074 | 7.4357 |
| -0.3732 | 8.3471 | 0.1263 | 7.5227 |
| -0.2536 | 8.3740 | 0.2589 | 7.5728 |
| -0.1340 | 8.3531 | 0.3909 | 7.5826 |
| -0.0137 | 8.2839 | 0.5231 | 7.5478 |
| 0.1079 | 8.1662 | 0.6564 | 7.4637 |
| 0.2317 | 7.9992 | 0.7916 | 7.3259 |
| 0.3584 | 7.7826 | 0.9300 | 7.1303 |
| 0.4892 | 7.5153 | 1.0728 | 6.8739 |
| 0.6252 | 7.1966 | 1.2218 | 6.5549 |
| 0.7679 | 6.8257 | 1.3789 | 6.1732 |
| 0.9191 | 6.4018 | 1.5470 | 5.7293 |
| 1.0815 | 5.9235 | 1.7297 | 5.2249 |
| 1.2584 | 5.3904 | 1.9322 | 4.6620 |
| 1.4548 | 4.8013 | 2.1623 | 4.0421 |
| 1.6785 | 4.1548 | 2.4329 | 3.3650 |
| 1.9421 | 3.4500 | 2.7680 | 2.6286 |
| 2.2695 | 2.6850 | 3.2209 | 1.8280 |
| 2.7140 | 1.8575 | 3.9614 | 0.9556 |
| 3.4456 | 0.9641 | 6.0000 | 0.1349 |
| 6.0000 | 0.0803 | N/A | N/A |

Figure 10.A.20 plots TIF by scale score for grade five mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.20. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding scale score values from 500 to 600 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 503. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.37, where the scale score is 537; or, for the hard pathway, when it reaches its peak at 7.58, where the scale score is 549. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 599.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 537; and among students routed to the hard pathway who have scale scores near 549. The test derives little information for students with scale scores that are either less than 504 or greater than 580.

Figure 10.A. TIF by scale score—mathematics, grade five

Table 10.A. Mathematics, Grade Five Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 503 | 0.1339 | 503 | 0.1017 |
| 503 | 0.9632 | 503 | 0.9532 |
| 503 | 1.8549 | 503 | 1.8179 |
| 503 | 2.6807 | 503 | 2.6017 |
| 503 | 3.4435 | 503 | 3.3094 |
| 503 | 4.1464 | 506 | 3.9450 |
| 504 | 4.7903 | 511 | 4.5121 |
| 508 | 5.3768 | 515 | 5.0153 |
| 511 | 5.9072 | 518 | 5.4598 |
| 515 | 6.3826 | 522 | 5.8505 |
| 517 | 6.8043 | 525 | 6.1926 |
| 520 | 7.1740 | 528 | 6.4909 |
| 523 | 7.4923 | 531 | 6.7497 |
| 525 | 7.7604 | 533 | 6.9717 |
| 527 | 7.9794 | 536 | 7.1595 |
| 530 | 8.1500 | 539 | 7.3142 |
| 532 | 8.2725 | 541 | 7.4357 |
| 534 | 8.3471 | 544 | 7.5227 |
| 537 | 8.3740 | 546 | 7.5728 |
| 539 | 8.3531 | 549 | 7.5826 |
| 541 | 8.2839 | 551 | 7.5478 |
| 543 | 8.1662 | 554 | 7.4637 |
| 546 | 7.9992 | 556 | 7.3259 |
| 548 | 7.7826 | 559 | 7.1303 |
| 550 | 7.5153 | 561 | 6.8739 |
| 553 | 7.1966 | 564 | 6.5549 |
| 556 | 6.8257 | 567 | 6.1732 |
| 559 | 6.4018 | 570 | 5.7293 |
| 562 | 5.9235 | 574 | 5.2249 |
| 565 | 5.3904 | 578 | 4.6620 |
| 569 | 4.8013 | 582 | 4.0421 |
| 573 | 4.1548 | 587 | 3.3650 |
| 578 | 3.4500 | 593 | 2.6286 |
| 584 | 2.6850 | 599 | 1.8280 |
| 592 | 1.8575 | 599 | 0.9556 |
| 599 | 0.9641 | 599 | 0.1349 |
| 599 | 0.0803 | N/A | N/A |

#### TIF for Mathematics, Grade Six

Figure 10.A.21 plots TIF by theta level for grade six mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.21. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.46, where theta is -0.12; or, for the hard pathway, when it reaches its peak at 7.72, where theta is 0.21. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.12; and among students routed to the hard pathway who have theta scores near 0.21. The test derives little information for students with theta scores that are either less than -3 or greater than 3.

Figure 10.A. TIF by theta—mathematics, grade six

Table 10.A. Mathematics, Grade Six Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.0995 | -6.0000 | 0.0719 |
| -3.6618 | 0.9644 | -3.3311 | 0.9595 |
| -2.9307 | 1.8599 | -2.5947 | 1.8414 |
| -2.4870 | 2.6925 | -2.1456 | 2.6535 |
| -2.1608 | 3.4666 | -1.8139 | 3.4008 |
| -1.8988 | 4.1850 | -1.5462 | 4.0866 |
| -1.6771 | 4.8496 | -1.3186 | 4.7122 |
| -1.4829 | 5.4610 | -1.1182 | 5.2781 |
| -1.3085 | 6.0190 | -0.9373 | 5.7837 |
| -1.1490 | 6.5222 | -0.7707 | 6.2292 |
| -1.0007 | 6.9702 | -0.6150 | 6.6141 |
| -0.8611 | 7.3612 | -0.4674 | 6.9395 |
| -0.7282 | 7.6940 | -0.3260 | 7.2063 |
| -0.6004 | 7.9675 | -0.1892 | 7.4162 |
| -0.4766 | 8.1806 | -0.0557 | 7.5708 |
| -0.3554 | 8.3331 | 0.0756 | 7.6723 |
| -0.2361 | 8.4246 | 0.2055 | 7.7220 |
| -0.1176 | 8.4557 | 0.3350 | 7.7216 |
| 0.0009 | 8.4269 | 0.4650 | 7.6720 |
| 0.1202 | 8.3393 | 0.5962 | 7.5736 |
| 0.2412 | 8.1941 | 0.7296 | 7.4264 |
| 0.3648 | 7.9928 | 0.8661 | 7.2302 |
| 0.4920 | 7.7368 | 1.0068 | 6.9848 |
| 0.6239 | 7.4281 | 1.1531 | 6.6894 |
| 0.7620 | 7.0677 | 1.3066 | 6.3439 |
| 0.9078 | 6.6577 | 1.4694 | 5.9480 |
| 1.0634 | 6.1997 | 1.6442 | 5.5021 |
| 1.2317 | 5.6946 | 1.8346 | 5.0069 |
| 1.4164 | 5.1442 | 2.0461 | 4.4622 |
| 1.6229 | 4.5500 | 2.2865 | 3.8688 |
| 1.8597 | 3.9127 | 2.5691 | 3.2254 |
| 2.1403 | 3.2340 | 2.9180 | 2.5288 |
| 2.4900 | 2.5135 | 3.3872 | 1.7710 |
| 2.9639 | 1.7481 | 4.1470 | 0.9370 |
| 3.7346 | 0.9240 | 6.0000 | 0.1643 |
| 6.0000 | 0.1112 | N/A | N/A |

Figure 10.A.22 plots TIF by scale score for grade six mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.22. The graph’s y-axis shows the TIF values from 0 to 9 in intervals of 1, and its x-axis shows corresponding scale score values from 600 to 700 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 603. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.46, where the scale score is 639; or, for the hard pathway, when it reaches its peak at 7.72, where the scale score is 645. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 699.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 639; and among students routed to the hard pathway who have scale scores near 645. The test derives little information for students with scale scores that are either less than 610 or greater than 680.

Figure 10.A. TIF by scale score—mathematics, grade six

Table 10.A. Mathematics, Grade Six Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 603 | 0.0995 | 603 | 0.0719 |
| 603 | 0.9644 | 603 | 0.9595 |
| 603 | 1.8599 | 603 | 1.8414 |
| 603 | 2.6925 | 603 | 2.6535 |
| 603 | 3.4666 | 607 | 3.4008 |
| 606 | 4.1850 | 612 | 4.0866 |
| 610 | 4.8496 | 617 | 4.7122 |
| 613 | 5.4610 | 620 | 5.2781 |
| 617 | 6.0190 | 624 | 5.7837 |
| 620 | 6.5222 | 627 | 6.2292 |
| 623 | 6.9702 | 630 | 6.6141 |
| 625 | 7.3612 | 633 | 6.9395 |
| 628 | 7.6940 | 635 | 7.2063 |
| 630 | 7.9675 | 638 | 7.4162 |
| 632 | 8.1806 | 640 | 7.5708 |
| 635 | 8.3331 | 643 | 7.6723 |
| 637 | 8.4246 | 645 | 7.7220 |
| 639 | 8.4557 | 648 | 7.7216 |
| 641 | 8.4269 | 650 | 7.6720 |
| 644 | 8.3393 | 652 | 7.5736 |
| 646 | 8.1941 | 655 | 7.4264 |
| 648 | 7.9928 | 658 | 7.2302 |
| 651 | 7.7368 | 660 | 6.9848 |
| 653 | 7.4281 | 663 | 6.6894 |
| 656 | 7.0677 | 666 | 6.3439 |
| 658 | 6.6577 | 669 | 5.9480 |
| 661 | 6.1997 | 672 | 5.5021 |
| 664 | 5.6946 | 676 | 5.0069 |
| 668 | 5.1442 | 680 | 4.4622 |
| 672 | 4.5500 | 684 | 3.8688 |
| 676 | 3.9127 | 689 | 3.2254 |
| 681 | 3.2340 | 696 | 2.5288 |
| 688 | 2.5135 | 699 | 1.7710 |
| 697 | 1.7481 | 699 | 0.9370 |
| 699 | 0.9240 | 699 | 0.1643 |
| 699 | 0.1112 | N/A | N/A |

#### TIF for Mathematics, Grade Seven

Figure 10.A.23 plots TIF by theta level for grade seven mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.23. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.81, where theta is -0.03; or, for the hard pathway, when it reaches its peak at 8.83, where theta is 0.09. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.03; and among students routed to the hard pathway who have theta scores near 0.09. The test derives little information for students with theta scores that are either less than -4 or greater than 4.

Figure 10.A. TIF by theta—mathematics, grade seven

Table 10.A. Mathematics, Grade Seven Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.1246 | -6.0000 | 0.0862 |
| -3.8773 | 0.9515 | -3.5035 | 0.9498 |
| -3.1327 | 1.8164 | -2.7571 | 1.8107 |
| -2.6767 | 2.6105 | -2.2996 | 2.6018 |
| -2.3395 | 3.3450 | -1.9614 | 3.3392 |
| -2.0675 | 4.0285 | -1.6894 | 4.0343 |
| -1.8371 | 4.6656 | -1.4598 | 4.6947 |
| -1.6353 | 5.2602 | -1.2598 | 5.3230 |
| -1.4545 | 5.8136 | -1.0817 | 5.9177 |
| -1.2897 | 6.3257 | -0.9202 | 6.4745 |
| -1.1371 | 6.7965 | -0.7715 | 6.9872 |
| -0.9944 | 7.2235 | -0.6329 | 7.4480 |
| -0.8595 | 7.6049 | -0.5021 | 7.8500 |
| -0.7307 | 7.9387 | -0.3774 | 8.1872 |
| -0.6069 | 8.2218 | -0.2572 | 8.4554 |
| -0.4870 | 8.4520 | -0.1402 | 8.6525 |
| -0.3698 | 8.6277 | -0.0255 | 8.7779 |
| -0.2547 | 8.7467 | 0.0881 | 8.8335 |
| -0.1407 | 8.8080 | 0.2014 | 8.8223 |
| -0.0272 | 8.8108 | 0.3152 | 8.7484 |
| 0.0867 | 8.7549 | 0.4304 | 8.6165 |
| 0.2017 | 8.6404 | 0.5478 | 8.4312 |
| 0.3186 | 8.4683 | 0.6681 | 8.1973 |
| 0.4384 | 8.2395 | 0.7923 | 7.9183 |
| 0.5619 | 7.9560 | 0.9212 | 7.5979 |
| 0.6903 | 7.6198 | 1.0561 | 7.2379 |
| 0.8251 | 7.2327 | 1.1983 | 6.8404 |
| 0.9677 | 6.7977 | 1.3493 | 6.4069 |
| 1.1203 | 6.3170 | 1.5115 | 5.9382 |
| 1.2856 | 5.7931 | 1.6875 | 5.4360 |
| 1.4672 | 5.2285 | 1.8812 | 4.9018 |
| 1.6705 | 4.6242 | 2.0979 | 4.3374 |
| 1.9033 | 3.9813 | 2.3460 | 3.7427 |
| 2.1788 | 3.2982 | 2.6383 | 3.1162 |
| 2.5212 | 2.5707 | 2.9992 | 2.4499 |
| 2.9840 | 1.7907 | 3.4818 | 1.7284 |
| 3.7376 | 0.9424 | 4.2556 | 0.9248 |
| 6.0000 | 0.1094 | 6.0000 | 0.1842 |

Figure 10.A.24 plots TIF by scale score for grade seven mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.24. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding scale score values from 700 to 800 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 703. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.81, where the scale score is 739; or, for the hard pathway, when it reaches its peak at 8.83 where the scale score is 743. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 799.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 739; and among students routed to the hard pathway who have scale scores near 743. The test derives little information for students with scale scores that are either less than 705 or greater than 790.

Figure 10.A. TIF by scale score—mathematics, grade seven

Table 10.A. Mathematics, Grade Seven Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 703 | 0.1246 | 703 | 0.0862 |
| 703 | 0.9515 | 703 | 0.9498 |
| 703 | 1.8164 | 703 | 1.8107 |
| 703 | 2.6105 | 703 | 2.6018 |
| 703 | 3.3450 | 705 | 3.3392 |
| 703 | 4.0285 | 710 | 4.0343 |
| 707 | 4.6656 | 714 | 4.6947 |
| 711 | 5.2602 | 718 | 5.3230 |
| 714 | 5.8136 | 721 | 5.9177 |
| 717 | 6.3257 | 724 | 6.4745 |
| 720 | 6.7965 | 727 | 6.9872 |
| 723 | 7.2235 | 729 | 7.4480 |
| 725 | 7.6049 | 732 | 7.8500 |
| 728 | 7.9387 | 734 | 8.1872 |
| 730 | 8.2218 | 736 | 8.4554 |
| 732 | 8.4520 | 739 | 8.6525 |
| 734 | 8.6277 | 741 | 8.7779 |
| 737 | 8.7467 | 743 | 8.8335 |
| 739 | 8.8080 | 745 | 8.8223 |
| 741 | 8.8108 | 747 | 8.7484 |
| 743 | 8.7549 | 749 | 8.6165 |
| 745 | 8.6404 | 752 | 8.4312 |
| 747 | 8.4683 | 754 | 8.1973 |
| 750 | 8.2395 | 756 | 7.9183 |
| 752 | 7.9560 | 759 | 7.5979 |
| 754 | 7.6198 | 761 | 7.2379 |
| 757 | 7.2327 | 764 | 6.8404 |
| 759 | 6.7977 | 767 | 6.4069 |
| 762 | 6.3170 | 770 | 5.9382 |
| 765 | 5.7931 | 773 | 5.4360 |
| 769 | 5.2285 | 777 | 4.9018 |
| 773 | 4.6242 | 781 | 4.3374 |
| 777 | 3.9813 | 785 | 3.7427 |
| 782 | 3.2982 | 791 | 3.1162 |
| 789 | 2.5707 | 798 | 2.4499 |
| 797 | 1.7907 | 799 | 1.7284 |
| 799 | 0.9424 | 799 | 0.9248 |
| 799 | 0.1094 | 799 | 0.1842 |

#### TIF for Mathematics, Grade Eight

Figure 10.A.25 plots TIF by theta level for grade eight mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.25. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 8.74, where theta is -0.11; or, for the hard pathway, when it reaches its peak at 7.95, where theta is 0.27. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.11; and among students routed to the hard pathway who have theta scores near 0.27. The test derives little information for students with theta scores that are either less than -3 or greater than 3.

Figure 10.A. TIF by theta—mathematics, grade eight

Table 10.A. Mathematics, Grade Eight Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.1371 | -6.0000 | 0.0940 |
| -3.9754 | 0.9523 | -3.5904 | 0.9484 |
| -3.2315 | 1.8182 | -2.8422 | 1.8040 |
| -2.7759 | 2.6117 | -2.3823 | 2.5828 |
| -2.4387 | 3.3434 | -2.0407 | 3.2964 |
| -2.1664 | 4.0213 | -1.7642 | 3.9524 |
| -1.9354 | 4.6501 | -1.5288 | 4.5559 |
| -1.7328 | 5.2336 | -1.3217 | 5.1094 |
| -1.5509 | 5.7739 | -1.1350 | 5.6144 |
| -1.3848 | 6.2715 | -0.9638 | 6.0707 |
| -1.2308 | 6.7272 | -0.8043 | 6.4787 |
| -1.0865 | 7.1400 | -0.6541 | 6.8373 |
| -0.9499 | 7.5092 | -0.5110 | 7.1464 |
| -0.8195 | 7.8333 | -0.3735 | 7.4054 |
| -0.6940 | 8.1109 | -0.2403 | 7.6141 |
| -0.5724 | 8.3405 | -0.1103 | 7.7723 |
| -0.4538 | 8.5201 | 0.0175 | 7.8802 |
| -0.3372 | 8.6485 | 0.1440 | 7.9379 |
| -0.2221 | 8.7236 | 0.2699 | 7.9457 |
| -0.1075 | 8.7439 | 0.3962 | 7.9041 |
| 0.0071 | 8.7078 | 0.5234 | 7.8140 |
| 0.1226 | 8.6137 | 0.6526 | 7.6761 |
| 0.2397 | 8.4605 | 0.7845 | 7.4915 |
| 0.3595 | 8.2466 | 0.9201 | 7.2614 |
| 0.4828 | 7.9715 | 1.0605 | 6.9871 |
| 0.6110 | 7.6343 | 1.2070 | 6.6696 |
| 0.7456 | 7.2347 | 1.3612 | 6.3099 |
| 0.8884 | 6.7731 | 1.5250 | 5.9085 |
| 1.0421 | 6.2496 | 1.7009 | 5.4655 |
| 1.2100 | 5.6658 | 1.8926 | 4.9795 |
| 1.3973 | 5.0226 | 2.1049 | 4.4490 |
| 1.6117 | 4.3217 | 2.3456 | 3.8705 |
| 1.8660 | 3.5650 | 2.6275 | 3.2390 |
| 2.1841 | 2.7541 | 2.9745 | 2.5476 |
| 2.6193 | 1.8901 | 3.4397 | 1.7870 |
| 3.3417 | 0.9726 | 4.1931 | 0.9438 |
| 6.0000 | 0.0718 | 6.0000 | 0.1709 |

Figure 10.A.26 plots TIF by scale score for grade eight mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.26. The graph’s y-axis shows the TIF values from 0 to 10 in intervals of 1, and its x-axis shows corresponding scale score values from 800 to 900 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 803. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 8.74, where the scale score is 839; or, for the hard pathway, when it reaches its peak at 7.95, where the scale score is 846. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 899.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 839; and among students routed to the hard pathway who have scale scores near 846. The test derives little information for students with scale scores that are either less than 808 or greater than 880.

Figure 10.A. TIF by scale score—mathematics, grade eight

Table 10.A. Mathematics, Grade Eight Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 803 | 0.1371 | 803 | 0.0940 |
| 803 | 0.9523 | 803 | 0.9484 |
| 803 | 1.8182 | 803 | 1.8040 |
| 803 | 2.6117 | 803 | 2.5828 |
| 803 | 3.3434 | 803 | 3.2964 |
| 803 | 4.0213 | 808 | 3.9524 |
| 805 | 4.6501 | 813 | 4.5559 |
| 809 | 5.2336 | 817 | 5.1094 |
| 812 | 5.7739 | 820 | 5.6144 |
| 815 | 6.2715 | 823 | 6.0707 |
| 818 | 6.7272 | 826 | 6.4787 |
| 821 | 7.1400 | 829 | 6.8373 |
| 823 | 7.5092 | 832 | 7.1464 |
| 826 | 7.8333 | 834 | 7.4054 |
| 828 | 8.1109 | 837 | 7.6141 |
| 831 | 8.3405 | 839 | 7.7723 |
| 833 | 8.5201 | 842 | 7.8802 |
| 835 | 8.6485 | 844 | 7.9379 |
| 837 | 8.7236 | 846 | 7.9457 |
| 839 | 8.7439 | 849 | 7.9041 |
| 841 | 8.7078 | 851 | 7.8140 |
| 844 | 8.6137 | 854 | 7.6761 |
| 846 | 8.4605 | 856 | 7.4915 |
| 848 | 8.2466 | 859 | 7.2614 |
| 850 | 7.9715 | 861 | 6.9871 |
| 853 | 7.6343 | 864 | 6.6696 |
| 855 | 7.2347 | 867 | 6.3099 |
| 858 | 6.7731 | 870 | 5.9085 |
| 861 | 6.2496 | 873 | 5.4655 |
| 864 | 5.6658 | 877 | 4.9795 |
| 867 | 5.0226 | 881 | 4.4490 |
| 872 | 4.3217 | 885 | 3.8705 |
| 876 | 3.5650 | 891 | 3.2390 |
| 882 | 2.7541 | 897 | 2.5476 |
| 890 | 1.8901 | 899 | 1.7870 |
| 899 | 0.9726 | 899 | 0.9438 |
| 899 | 0.0718 | 899 | 0.1709 |

#### TIF for Mathematics, Grade Eleven

Figure 10.A.27 plots TIF by theta level for grade eleven mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.27. The graph’s y-axis shows the TIF values from 0 to 12 in intervals of 2, and its x-axis shows corresponding theta values from -6 to 6 in intervals of 2.

For both pathways, the TIF value is near zero when theta is -6. The TIF value then increases as theta increases until the TIF value for the easy pathway reaches its peak at 10.25, where theta is -0.28; or, for the hard pathway, when it reaches its peak at 9.11, where theta is -0.21. After the peak TIF value, the TIF value decreases as theta increases until the TIF value is near zero, where theta is 6.

The plot indicates that the test derives more information among students routed to the easy pathway who have theta scores near -0.28; and among students routed to the hard pathway who have theta scores near -0.21. The test derives little information for students with theta scores that are either less than -3 or greater than 2.

Figure 10.A. TIF by theta—mathematics, grade eleven

Table 10.A. Mathematics, Grade Eleven Theta TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Theta Easy | TIF Easy | Theta Hard | TIF Hard |
| -6.0000 | 0.1153 | -6.0000 | 0.0988 |
| -3.7874 | 0.9416 | -3.6157 | 0.9271 |
| -3.0366 | 1.8104 | -2.8511 | 1.7741 |
| -2.5823 | 2.6430 | -2.3874 | 2.5901 |
| -2.2522 | 3.4513 | -2.0507 | 3.3870 |
| -1.9911 | 4.2371 | -1.7848 | 4.1623 |
| -1.7739 | 4.9975 | -1.5638 | 4.9084 |
| -1.5871 | 5.7272 | -1.3734 | 5.6171 |
| -1.4223 | 6.4210 | -1.2051 | 6.2791 |
| -1.2739 | 7.0741 | -1.0531 | 6.8871 |
| -1.1382 | 7.6807 | -0.9134 | 7.4338 |
| -1.0125 | 8.2352 | -0.7830 | 7.9129 |
| -0.8946 | 8.7330 | -0.6598 | 8.3177 |
| -0.7828 | 9.1690 | -0.5418 | 8.6436 |
| -0.6759 | 9.5376 | -0.4277 | 8.8859 |
| -0.5726 | 9.8345 | -0.3162 | 9.0425 |
| -0.4720 | 10.0547 | -0.2060 | 9.1130 |
| -0.3733 | 10.1943 | -0.0962 | 9.0992 |
| -0.2754 | 10.2502 | 0.0143 | 9.0054 |
| -0.1777 | 10.2199 | 0.1264 | 8.8382 |
| -0.0793 | 10.1023 | 0.2411 | 8.6064 |
| 0.0207 | 9.8972 | 0.3593 | 8.3204 |
| 0.1233 | 9.6054 | 0.4819 | 7.9920 |
| 0.2295 | 9.2293 | 0.6100 | 7.6325 |
| 0.3406 | 8.7722 | 0.7445 | 7.2531 |
| 0.4582 | 8.2382 | 0.8863 | 6.8635 |
| 0.5843 | 7.6324 | 1.0365 | 6.4701 |
| 0.7215 | 6.9607 | 1.1960 | 6.0768 |
| 0.8733 | 6.2300 | 1.3663 | 5.6822 |
| 1.0448 | 5.4476 | 1.5489 | 5.2810 |
| 1.2439 | 4.6203 | 1.7463 | 4.8618 |
| 1.4836 | 3.7550 | 1.9622 | 4.4086 |
| 1.7879 | 2.8582 | 2.2031 | 3.9006 |
| 2.2105 | 1.9338 | 2.4805 | 3.3161 |
| 2.9217 | 0.9826 | 2.8172 | 2.6364 |
| 6.0000 | 0.0468 | 3.2660 | 1.8519 |
| N/A | N/A | 3.9967 | 0.9672 |
| N/A | N/A | 6.0000 | 0.1382 |

Figure 10.A.28 plots TIF by scale score for grade eleven mathematics for both the easy and hard pathways. The data used to create this graph is found in the table that immediately follows, table 10.A.28. The graph’s y-axis shows the TIF values from 0 to 12 in intervals of 2, and its x-axis shows corresponding scale score values from 900 to 1000 in intervals of 20.

For both pathways, the TIF value is near zero when the scale score is at its minimum of 903. The TIF value then increases as the scale score increases until the TIF value for the easy pathway reaches its peak at 10.25, where the scale score is 936; or, for the hard pathway, when it reaches its peak at 9.11, where the scale score is 937. After the peak TIF value, the TIF value decreases as the scale score increases until the TIF value is near zero, where the scale score reaches its maximum of 999.

The plot indicates that the test derives more information among students routed to the easy pathway who have scale scores near 936; and among students routed to the hard pathway who have scale scores near 937. The test derives little information for students with scale scores that are either less than 904 or greater than 980.

Figure 10.A. TIF by scale score—mathematics, grade eleven

Table 10.A. Mathematics, Grade Eleven Scale Score TIF Data

|  |  |  |  |
| --- | --- | --- | --- |
| Scale Score Easy | TIF Easy | Scale Score Hard | TIF Hard |
| 903 | 0.1153 | 903 | 0.0988 |
| 903 | 0.9416 | 903 | 0.9271 |
| 903 | 1.8104 | 903 | 1.7741 |
| 903 | 2.6430 | 903 | 2.5901 |
| 903 | 3.4513 | 903 | 3.3870 |
| 904 | 4.2371 | 908 | 4.1623 |
| 908 | 4.9975 | 912 | 4.9084 |
| 912 | 5.7272 | 916 | 5.6171 |
| 915 | 6.4210 | 919 | 6.2791 |
| 917 | 7.0741 | 922 | 6.8871 |
| 920 | 7.6807 | 924 | 7.4338 |
| 922 | 8.2352 | 927 | 7.9129 |
| 925 | 8.7330 | 929 | 8.3177 |
| 927 | 9.1690 | 931 | 8.6436 |
| 929 | 9.5376 | 933 | 8.8859 |
| 931 | 9.8345 | 935 | 9.0425 |
| 932 | 10.0547 | 937 | 9.1130 |
| 934 | 10.1943 | 939 | 9.0992 |
| 936 | 10.2502 | 942 | 9.0054 |
| 938 | 10.2199 | 944 | 8.8382 |
| 940 | 10.1023 | 946 | 8.6064 |
| 942 | 9.8972 | 948 | 8.3204 |
| 944 | 9.6054 | 950 | 7.9920 |
| 946 | 9.2293 | 953 | 7.6325 |
| 948 | 8.7722 | 955 | 7.2531 |
| 950 | 8.2382 | 958 | 6.8635 |
| 952 | 7.6324 | 961 | 6.4701 |
| 955 | 6.9607 | 964 | 6.0768 |
| 958 | 6.2300 | 967 | 5.6822 |
| 961 | 5.4476 | 970 | 5.2810 |
| 965 | 4.6203 | 974 | 4.8618 |
| 969 | 3.7550 | 978 | 4.4086 |
| 975 | 2.8582 | 983 | 3.9006 |
| 983 | 1.9338 | 988 | 3.3161 |
| 996 | 0.9826 | 994 | 2.6364 |
| 999 | 0.0468 | 999 | 1.8519 |
| N/A | N/A | 999 | 0.9672 |
| N/A | N/A | 999 | 0.1382 |

1. This definition was retrieved from the Child Care Reporting--Child is English Learner web page on the CDE website. [↑](#footnote-ref-2)
2. Data for 2020–2021 was retrieved from the CalEdFacts web page on the CDE website. [↑](#footnote-ref-3)
3. This definition was retrieved from the CDE California Longitudinal Pupil Achievement Data System (CALPADS) web page on the CDE website. [↑](#footnote-ref-4)
4. This technical report is based on the version of the *Usability, Accessibility, and Accommodations Guidelines* that was available during the 2020–2021 CAASPP administration. [↑](#footnote-ref-5)
5. Students who answered fewer than four items at Stage 1 are considered as “partial completers”; students who did not answer any items are considered as “non-completers.” “Non-completers” and “partial completers” received the lowest possible scale score. Therefore, scores of such students were not included in the analysis. Refer to subsection [*7.1.1 Scoring of Incomplete Cases*](#_Incomplete_and_Complete) for a list of cases where the tests are considered as “incomplete.” [↑](#footnote-ref-6)
6. The *Crosswalk* has since been replaced with the Accessibility Strategies web page on the Tools for Teachers website. [↑](#footnote-ref-7)
7. In several applications of the Bookmark method, a target probability of two-thirds is used to define “most likely.” Refer, for example, to Mitzel, et al. (2001). [↑](#footnote-ref-8)
8. Detailed information regarding the determination of the achievement levels can be found in the *Standard-Setting Technical Report for the CAAs* (ETS, 2016). [↑](#footnote-ref-9)
9. The number of students tested in the 2020–2021 administration is smaller than in previous years as an impact of the COVID-19 pandemic. [↑](#footnote-ref-10)
10. The number of students tested in the 2020–2021 administration is smaller than in previous years as an impact of the COVID-19 pandemic. [↑](#footnote-ref-11)
11. S. 1177—114th Congress: Every Student Succeeds Act. 2015. Title 1, Part A, Subpart 1, Section 1111(b)(2)(D)(ii )(I) [↑](#footnote-ref-12)
12. The IDEA is the primary federal program that authorizes state and local aid for special education and related services for children with disabilities. [↑](#footnote-ref-13)
13. The TIFs were calculated by the inverse of estimated conditional standard errors of measurement (CSEMs) of theta (estimated ability) values for the spring 2018 sample. [↑](#footnote-ref-14)