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HumRRO

Human Resources Research Organization

Development of Performance Level Descriptors for the California Standards Tests (CSTs) and High School Exit Exam (CAHSEE)

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Executive Summary

California has long been a leader in using explicit standards for student achievement to improve and reform K–12 educational programs throughout the state. The project described in this report is the latest step in its long history of work to clarify what students should know and be able to do in different subjects after completing each grade. The development and adoption of the California Achievement Standards by the State Board of Education (SBE) provided the foundation for continuing standards-based reform in California. The current project builds on these standards by describing the levels and sequence of mastery of specific standards as students move from basic competency in a subject to proficiency and, in many cases, to a more advanced level of mastery of the subject.

In Fall 2006, the California Department of Education (CDE), with advice and consent from the SBE, issued a request for proposals for an independent evaluation of the California Standards and Assessment System. The Human Resources Research Organization (HumRRO) was awarded a contract to conduct this evaluation and work began on October 27, 2006. The evaluation included two main activities. The first activity, an independent review of the alignment of the assessments used for school and district accountability with the California Achievement Standards, is reported separately. This report covers the second activity, the development of descriptions for different levels of performance on each of the assessments. In the technical literature and throughout the remainder of this report, the descriptions are referred to as performance level descriptors or PLDs.

California's Need for Independent Development of PLDs

The use of achievement levels to summarize student performance on California's assessment have been in place for some time. The California *Education Code*, Section 60605.5 states:

> **"On or before November 15, 2001, the State board of Education shall adopt a performance standards system that includes the following components:**
>
> - **Performance levels**
> - **Performance level descriptors**
> - **Test administration data from the applicable SBE adopted tests**
> - **Exemplars of pupil performance that exemplify the content and performance standards**
> - **The SBE shall ensure that the performance standards system is aligned to the state's academically rigorous content standards**

The initial descriptions of the performance levels established by the SBE in response to this requirement were relatively generic. The same descriptions were used for all grades and subjects. The need for new and more specific performance level descriptors has been prompted, in part, by provisions of the No Child Left Behind Act (NCLB). NCLB has had a very significant impact on state departments of education. States have been required to modify and significantly expand their assessment and accountability systems to meet the provisions of NCLB. The United States Department of Education (USED), in implementing NCLB, has required states to submit extensive documentation of their systems to a peer review process. The technical adequacy of each state's systems is reviewed by a panel of experts and then officials in USED reach an overall decision as to whether the state's system meets NCLB requirements.

On March 10, 2003, USED provided non-regulatory guidance with respect to academic achievement standards. This guidance stated:

> **Academic achievement standards should be conceptualized as a system that includes the following components:**
>
> - **<u>Achievement levels</u> — Labels for the levels of student achievement that convey the degree of student achievement in a given content area. Each achievement level encompasses a range of student achievement.**
> - **<u>Achievement descriptors</u> — Descriptions of the competencies associated with each level of achievement. Achievement descriptors describe what students at each achievement level know and can do.**
> - **<u>Exemplars</u> — Examples of student work that illustrate the range of achievement in a content area within each achievement level.**
> - **<u>Cut-scores</u> — Scores on an assessment that separate one level of achievement** from another.

The NCLB requirements in this area were further detailed as USED provided guidance to states on preparing documentation of their accountability systems for peer review. Guidance dated April 28, 2004 stated:

> **"For each achievement level, a State must provide descriptions of the competencies associated with that achievement level and must determine the assessment scores (cut-scores) that differentiate among the achievement levels. The State must also provide a descriptor of the rationale and procedures used to determine each achievement level. Unlike content standards, which may address a cluster of grade levels, academic achievement standards must be developed for each grade and subject assessed, even if the State's academic content standards cover more than one grade."**

While most of California's assessment and accountability system did meet NCLB requirements, some further documentation has been required by USED before full approval is granted. The independent evaluation addresses two of the pending needs for documentation by: (a) providing an independent evaluation of the alignment of the required assessments to the state's content and performance standards for academic achievement and (b) developing descriptors of the knowledge and skills needed to reach each level of performance (performance level descriptors or PLDs) on each of the required assessments. Results from a new alignment study to meet the first requirement are reported separately (Taylor, et al., 2007).

How the Proposed PLDs Were Developed

Descriptors of the knowledge and skills associated with different performance or achievement levels have sometimes been used proscriptively, as a step in developing performance standards defined by minimum cut-scores on each assessment. In this case, the performance level descriptors reflect consensus judgments about what students *should know* and be able to do. In the present case, performance standards have already been established for each of California's assessments. There was neither a need nor an intention to reset the performance standards. The performance level descriptors developed here are ***empirically based*** descriptions of what students at each performance level *do know* and what they are able to do. The process used here was necessarily different from the case where descriptors are based only on expert judgments. The use of empirical data to identify test questions that students at each level answer correctly provides important evidence in support of the validity of the resulting descriptors. This evidence demonstrates that students at a particular level actually do possess the skills included in the corresponding descriptor.

HumRRO developed proposed PLDs for each of the 28 assessments shown in Table 1. For each assessment, we worked with the test developer to identify test questions (items) that indicated what students at each performance level know and can do. The resulting item maps were used by panels of teachers and other content experts to develop descriptions of the knowledge and skills required to answer the items at each performance level. After the development workshops, the initial descriptors were edited, reviewed and revised. Each of these steps is described briefly here and in more detail in Chapter 2 of this report.

Item Maps

Educational Testing Service (ETS), the test developer for the CDE, analyzed data from the operational California Standards Test (CST) forms used from 2003 through 2006 to identify all of the candidate items for the item maps. The one exception was the science assessment which is relatively new. For the 8th and 10th grade science assessments, only the 2006 test form was available. For the California High School Exit Examination (CAHSEE), several different forms are used each year, so we did not need to go back as far to include items from at least four operational test forms. This was fortunate, because the blueprints for the CAHSEE changed in 2004 and results from prior

administrations would not be comparable. Also, the CAHSEE response rates were based on the census testing of 10th graders. Eleventh and twelfth grade students retaking the CAHSEE were excluded from the computations.

Table ES-1. Subjects and Grades for Performance Level Descriptors

Subject	Grades	Total Number of Tests
English-language Arts (ELA)	2–8, 10 (CAHSEE)*	8
Mathematics	2–7, 10 (CAHSEE) * plus 7 end-of-course tests	14
Science	5, 8, 10	3
History-Social Science	8, 10, 11	3
Total Grade-Subject Combinations		28

* Note: The CSTs are used for all of the grades and courses referenced except for the two 10th grade tests. The CAHSEE, administered to all 10th grade students, is used for high school accountability and is administratively separate from the CSTs.

For each item, ETS computed the percent of students at each achievement level who answered the item correctly. Items were selected to illustrate what students at a performance level could do if most (at least two-thirds) of the students at that level could answer the item correctly **and** the majority of students at the next lower level could not answer the item correctly. Items were not included in the item maps if they did not differentiate between adjacent performance levels or, in a few cases, if less than two-thirds of the students at the advanced level could not answer correctly.

HumRRO selected a sample of the mapped items to use in the PLD workshops. In general, we tried to select four items from each reporting category at each performance level. Most tests had four or five reporting categories leading to 16 to 20 items per performance level. In some cases, particularly at the below basic level of performance and for the 8th and 10th grade science tests, the total number of items identified by ETS was less than the target for sampling. In these cases, we took all of the available items for the performance level.

Panelists

CDE sent letters to each California school district requesting nominations for teachers and other curriculum experts to participate in the panels. CDE and SBE staff reviewed nominations and HumRRO selected samples of the remaining nominees for each subject. Insofar as possible, panelists were selected to represent the geographic and demographic distribution of teachers in the target subjects, although experience in the target subject was more important than exact demographic representation. Selected experts were invited to participate in the alignment workshop for their subject. Approximately half of the selected experts were also invited to participate in the PLD development workshop that followed immediately after each of the test alignment

workshops. Table 2 shows the number of panelists participating in the PLD workshops for each subject. Years of teaching experience in the target subject for the panelists selected ranged from a minimum of 3 up to 32, with a median of 16.4. Additional information on the participating panelists is provided in the body of the report.

Table ES-2. Number of Panelists per Content Area and Grade Range Participating in the PLD Workshops

Content Area and Grade Range	Number of Panelists
ELA — Grades 2–5	5
ELA — Grades 6–8 and CAHSEE	5
Math — Grades 2–through 4	4
Math — Grades 5–7	4
Math — End of Course Tests (Grade 8)	3
Math — Integrated I, II, III and CAHSEE	3
Science — Grades 5, 8, 10	6
History/Social Science — Grades 8, 10, 12	3
Total Panelists	33

Workshop Procedures

Panelists were provided with an overview of the goals and procedures for the workshop. A copy of the overview slides is included as Appendix C to this report. Following the overview, the panelists began by reviewing the items mapped to the Proficient level in one reporting category (e.g., reading comprehension for ELA or number sense for mathematics) in a particular grade or course. They developed a consensus list of the knowledge and skills required to answer these items correctly. The panelists then proceeded to develop similar lists for items mapped to the Basic level, the Below Basic level and then the Advanced level within that same reporting category. The panelists then discussed how the knowledge and skill lists varied across performance level and considered ways of showing progression across levels in terms of frequency, consistency, or cognitive skill levels.

In some cases, the panels developed descriptors for each grade within a single reporting category before moving to the next category. For the end-of-course tests and also the history and science tests, the reporting categories were different for the different assessments. In these cases, the panels completed knowledge and skill lists for all of the reporting categories for a single test before moving to the next test. Having each panel work on assessments for several grades or courses increased the consistency of descriptions across the assessments within a subject.

Editing and Revision

HumRRO and its subcontractor, the test developer ETS, edited and summarized the descriptors developed by the panel of experts. A summary statement was added for each performance level, incorporating examples of the skills identified in each reporting category. The edited descriptors were further revised based on feedback from content experts at CDE. Finally, the original panels reviewed the revised draft, indicated their acceptance of them, and, in a few cases, provided suggestions for further refinements.

What's Next for the PLDs

The complete set of performance level descriptors is provided in Appendix A to this report. In order to satisfy NCLB requirements, the State Board of Education must adopt some version of these descriptors at its March 2007 meeting. California then has several options for deciding how the PLDs will be used.

HumRRO believes that the current descriptors provide detailed, empirically based information about what students at each performance level know and can do. These descriptors were developed, for the most part, by California teachers, and teachers are the most appropriate audience for this information. It is critical, however, that teachers understand that the skills listed are only *examples* of what students at each level need to know and be able to do and not a comprehensive list. Teachers must be referred back to the California Content Standards for a complete description of the skills covered by each assessment.

The summary statements for each performance level also provide a starting point for developing a briefer set of exemplar skills for each performance level that can be used in reporting test results to students and their parents. Parents and students interested in more detailed information should be referred to the California Content Standards.

DEVELOPMENT OF PERFORMANCE LEVEL DESCRIPTORS FOR THE CALIFORNIA STANDARDS TESTS (CSTS) AND HIGH SCHOOL EXIT EXAM (CAHSEE)

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DEVELOPMENT OF PERFORMANCE LEVEL DESCRIPTORS FOR THE CSTS AND CAHSEE

Chapter 1: Introduction

California has long been a leader in using explicit standards for student achievement to improve and reform K–12 educational programs throughout the state. The project described in this report is the latest step in its long history of work to clarify what students should know and be able to do in different subjects after completing each grade. The development and adoption of the California Achievement Standards by the State Board of Education (SBE) provided the foundation for continuing standards-based reform in California. The current project builds on these standards by describing the levels and sequence of mastery of specific standards as students move from basic competency in a subject to proficiency and, in many cases, to a more advanced level of mastery of the subject.

In Fall 2006, the California Department of Education (CDE), with advice and consent from the SBE, issued a request for proposals for an independent evaluation of the California Standards and Assessment System. The Human Resources Research Organization (HumRRO) was awarded a contract to conduct this evaluation and work began on October 27, 2006. The evaluation included two main activities. The first activity, an independent review of the alignment of the assessments used for school and district accountability with the California Achievement Standards, is reported separately. This report covers the second activity, the development of descriptions for different levels of performance on each of the assessments. In the technical literature and throughout the remainder of this report, the descriptions are referred to as performance level descriptors or PLDs.

Before describing the methods used in developing and presenting the performance level descriptors, we provide a brief discussion of what performance level descriptors are and why they play an important role in assessing student and school accountability.

Nature and Purpose of Performance Level Descriptors

What are Performance Level Descriptors (PLDs)?

Before we can meaningfully discuss performance level descriptors, we must define what we mean by *performance levels*. Performance levels are defined by score ranges on an assessment tied to how test results are used. Most commonly, a minimum passing score will be identified that defines two score ranges or performance levels: failing (below the minimum score) and passing (at or above the minimum score). The minimum scores for each achievement level of a given test, called cut-scores, are referred to as *performance standards.*[1]

[1] The term *performance standard* referring to score levels on a test must be clearly distinguished from the *content standards* that define the knowledge and skills that the test is intended to measure.

In 1990, the National Assessment Governing Board introduced achievement levels[2] in reporting results from the National Assessment of Educational Progress (National Research Council, 1999). The idea was to gather consensus judgments about what students should know and be able to do in a subject upon completion of a particular grade or course and report the percentage of students who met that level of mastery. It was believed that gains in the percentage of students judged to be proficient would be more meaningful than merely reporting increases in score levels on a more-or-less arbitrary scale. In addition to a level indicating proficiency in a subject, the Governing Board defined a lower level indicating *basic* mastery and a high level indicating *advanced* mastery of the content assessed. A fourth reporting category, *below basic*, is used to describe students who have not yet achieved even a basic mastery of the subject.

Descriptors of the knowledge and skills associated with different performance or achievement levels have sometimes been used proscriptively, as a step in developing performance standards defined by minimum cut-scores. In this case, the performance level descriptors reflect consensus judgments about what students *should know* and be able to do. In the present case, performance standards have already been established for each of California's assessments. The performance level descriptors developed here are empirically-based descriptions of what students at each performance level *do know* and what they are able to do. The process used here was necessarily different from the case where descriptors are based only on expert judgments.

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The use of achievement levels to summarize student performance on California's assessment has been in place for some time. The California *Education Code*, Section 60605.5 states:

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[2] The Governing Board used the term achievement level to refer to mastery of the content measured by the test rather than referring simply to performance on the assessment as suggested by the term performance levels. In addition, there was some concern that the term performance might connote a more limited and possibly pejorative concept of mastery.

The initial descriptions of the performance levels established by the SBE in response to this requirement were relatively generic. The same descriptions were used for all grades and subjects. The need for new and more specific performance level descriptors has been prompted by provisions of the No Child Left Behind Act (NCLB).

NCLB has had a very significant impact on state departments of education. States have been required to modify and significantly expand their assessment and accountability systems to meet the provisions of NCLB. The United States Department of Education (USED), in implementing NCLB, has required states to submit extensive documentation of their systems to a peer review process. The technical adequacy of each state's systems is reviewed by a panel of experts and then officials in USED reach an overall decision as to whether the state's system meets NCLB requirements.

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While most of California's assessment and accountability system did meet NCLB requirements, some further documentation has been required by USED before full approval is granted. The independent evaluation project reported here addressed two of the pending needs for documentation by: (a) providing an independent evaluation of the alignment of the required assessments to the state's content and performance standards for academic achievement and (b) developing descriptors of the knowledge and skills needed to reach each level of performance (performance level descriptors or PLDs) on each of the required assessments. This report describes the development of the PLDs. Results from a new alignment study to meet the first requirement are reported separately (Taylor, et al., 2007).

There were two primary reasons why PLDs were needed for each of California's assessments. The first reason, which was the primary driver of the intense development schedule, was to satisfy documentation requirements for compliance with NCLB. The more important reason was to improve communication with teachers and with students and their parents about the skills that students at each performance level have mastered and the skills needed to reach the next level. The value of the descriptors for improved reporting is also a key reason why USED requires them.

Organization and Contents of the Report

This report is organized into three chapters. Following this introductory chapter, Chapter 2 includes a description of the methods used to develop recommended PLDs. The methods included analyses of existing test information to map questions onto performance levels and a workshop where panelists reviewed the item maps and identified critical knowledge and skills needed to answer the questions mapped to each performance level.

Chapter 3 includes a discussion of results from the item mapping and the workshop. But the story does not end here. Workshop participants provided detailed descriptions of specific skills required at each performance level for each content strand or reporting category. While useful for technical documentation for content specialists, these descriptions were too detailed for most intended uses in reporting. We describe subsequent work with the test developers to create summary descriptions for each performance level based on the information provided by the workshop panelists later in Chapter 3. The report concludes with a brief discussion of further steps needed to finalize the PLDs and adopt them for use in reporting.

Chapter 2: Methods

Introduction

We developed PLDs for English-language arts, mathematics, science, and history/social science at various grade levels, as shown in Table 1. We used a three-step process to develop empirically based descriptions of the California Standards Tests (CSTs) and California High School Exit Examination (CAHSEE) performance levels. First, we analyzed data for several test forms to identify questions that most students at a given performance level answered correctly but that the majority of students at the next lower level could not. The result was a set of item maps relating test questions to specific performance levels. The next step was to assemble panels of content experts and ask them to identify the specific knowledge and skills needed to answer the questions at each performance level correctly. The panelists participated in workshops on November 30 and December 3, 2006. The final step was to work with the test developers to create summaries of the information provided by the panelists. We describe the procedures used in each of these steps in more detail in the following sections of this chapter.

Table 1. Subjects and Grades for Performance Level Descriptors

Subject	Grades	Total Number of Tests
English-language Arts (ELA)	2–8, 10 (CAHSEE)*	8
Mathematics	2–7, 10 (CAHSEE) * plus 7 end-of-course tests	14
Science	5, 8, 10	3
History-Social Science	8, 10, 11	3
Total Grade-Subject Combinations		28

* Note: The California Standards Tests are used for all of the grades and courses referenced except for the two 10th grade tests. The CAHSEE, administered to all 10th grade students, is used for high school accountability and is administratively separate from the CSTs.

Item Maps

To provide empirical evidence for the performance level descriptions that were developed, we analyzed test data to see how students at different levels performed on different types of test questions. We used this information to build item maps that included a sample of questions covering the content strands or reporting categories for the test and also covering the different performance levels.

We began by developing a rule for assigning test questions (items) to performance levels. From a wide range of possible rules for making such assignments, we chose what we believe to be the most straightforward, by focusing on the percentage of students at a given level who answered the item correctly. Performance

levels are not, of course, simple discrete categories. There is a continuum of performance within each level. Students who are just barely proficient are somewhat less likely to answer a given question correctly than students who have almost reached the advanced level. Nonetheless, averaging across the range covered by each achievement level provides a clear and reasonable summary of results for students at that level.

The next issue in making item assignments is what we mean by *most students* in the sentence, “Most students at this level answered the question correctly.” The same issue comes up in mapping items to scale points during standard-setting; commonly used definitions for *most* range from one-half to three-quarters. We chose two-thirds. This is one of the most commonly used “response probabilities” for mapping and was also the proportion used when the CSTs and CAHSEE performance standards were set.

A related question is what we meant by, “A majority of students at the next lower level did not answer the question correctly.” We took this to mean more than half failed to answer correctly, leading to the general rule: An item was mapped to a specific performance level if two-thirds or more of the students at that level answered the question correctly while fewer than half of the students at the next lower level answered correctly.

For the CSTs, most students at the Far Below Basic level answered few, if any, questions correctly. In some cases, we modified the rule slightly to select items at the Far Below Basic (or Not Pass, for CAHSEE) that at least 60 percent of the students at that level answered correctly. This allowed us to find at least a few items that students at this level could answer correctly. From these, the panelists constructed some empirically based statements about what students at this level know and can do.

Educational Testing Service (ETS), the test developer, analyzed data from the operational CST forms used from 2003 through 2006 to identify all of the candidate items for the item maps. The one exception was the science assessment, which is relatively new. For the 8th and 10th grade science assessments, only the 2006 test form was available. For the CAHSEE, several different forms are used each year. We included items from the forms used with the census administrations in February and March of 2004 and 2005. These four forms followed the revised blueprints for the CAHSEE adopted in 2004. The CAHSEE response rates were based on the census testing of 10th graders. Eleventh and Twelfth grade students retaking the CAHSEE were excluded from the computations.

A final decision for the item maps was how many items to include. We needed to include enough items so that conclusions about knowledge and skill at each level would not be based on just one or two items. At the same time, there was a limit to the number of different questions panelists could be expected to process in the time available for developing the descriptors. Based on a brief pilot test with HumRRO staff, we selected up to four questions from each content strand or reporting category at each of the performance levels.

For most grades, there were five reporting categories for the ELA tests, giving us up to 20 questions for each performance level. Similarly, there were four or five reporting categories for the mathematics test, five for each of the history tests and four to six for the science tests, yielding up to 16 to 20 questions for each performance level. In many cases, particularly for the below basic and sometimes for the advanced levels, there were fewer than four items in a reporting category that mapped cleanly onto the performance level. In this case, we included all of the available items in the resulting item maps. For performance levels where there were more than four items in a reporting category, we selected items that: (a) covered as many different content standards as possible, (b) maximized the number of released, or soon-to-be released, items, and (c) maximized the difference between percent correct at the target level and percent correct at the next lower level (in that order).

One of the mathematics content strands, mathematical reasoning, proved problematic. Mathematical reasoning is an embedded strand in that items measuring these content standards also measure content standards for one of the other mathematics strands. In the item maps developed by ETS, the mathematical reasoning items were mapped onto performance levels for their primary content strand. Descriptors for these items would have been redundant with the descriptors developed for their primary content standards. For this reason, mathematical reasoning was not included as a separate category in the mathematics PLDs.

Results from the application of these rules, including counts of the number of items in each reporting category mapped to the different performance levels, are presented in Chapter 3. Because the item maps included secure test questions, they cannot be reproduced in this report. Additional summary statistics about the item maps are presented in Appendix B.

Panelists

We recruited teachers to participate in the performance level description (PLD) workshops. Teachers are necessarily familiar with the content standards on which the assessments are based and the curriculum used to teach these standards. They also have daily contact with student performance in mastering these standards and are therefore in a good position to identify the skills needed to answer specific questions correctly. In addition, teachers are also the primary intended audience for the detailed version of the performance level descriptors.

A subset of the panelists who participated in the alignment workshops was invited to stay a third day to participate in the PLD workshops. The process of recruiting participants is described in detail in the alignment study report and is summarized briefly here. CDE sent a message to all California school districts requesting nominations of exemplary teachers in each of the content areas and grade levels. We required a minimum of three years' experience teaching in the targeted grades and also requested nominations of teachers with qualifications and experience teaching English learners and students with disabilities. We also accepted nominations of curriculum specialists who had previous experience teaching the content covered in these assessments.

Each of the two PLD workshops involved several groups of panelists, organized by subject and, for ELA and Mathematics, by grade range. Panelists worked on descriptions for three or four related assessments to provide consistency in the descriptors across these assessments. We sought three to five panelists for each content and grade-range group. The number was set to balance the need for ensuring diversity in experience and perspectives with the need to achieve a full consensus.

Table 2 shows the number of panelists in each group and grade-range. In the flurry to finalize participation during the Thanksgiving breaks, we unintentionally invited more panelists for the science assessments than originally planned. Otherwise, we hit our intended targets.

Table 2. Number of Panelists per Content Area and Grade Range Participating in the PLD Workshops

Content Area and Grade Range	Number of Panelists
ELA – Grades 2–5	5
ELA – Grades 6–8 and CAHSEE	5
Math – Grades 2–through 4	4
Math – Grades 5–7	4
Math – End of Course Tests (Grade 8)	3
Math – Integrated I, II, III and CAHSEE	3
Science — Grades 5, 8, 10	6
History/Social Science — Grades 8, 10, 12	3
Total Panelists	33

Table 3 shows the demographic characteristics of the PLD panelists. The panelists were not a precise reflection of the demographic distribution of all California teachers. Selecting more experienced teachers through a nomination process imposed some constraints, but the resulting panel did show sufficient diversity to ensure that different viewpoints were included.

Workshop Procedures and Instructions

The development of the performance level descriptors built on exercises and results from the corresponding alignment workshop. See the separate report of the alignment workshop results (Taylor, et al., 2007) for more details. Specifically, the alignment workshop provided:

- A common group understanding of both content specifications and test questions based on efforts to match items to content standards
- A common understanding of cognitive complexity as a key dimension along which descriptions might vary across levels within a grade and across grades

- Specific cognitive complexity (depth-of-knowledge) ratings for both the content standards and the test questions
- Experience working with other members of the panel that will facilitate the process of reaching consensus on draft descriptors

During the alignment workshops, the panelists also signed confidentiality agreements and completed administrative documents relating to reimbursement for expenses.

Table 3. Demographic Characteristics of the PLD Panelists

Demographic Group	Number of Panelists
Gender	
Male	11
Female	22
Geographic Region	
Northern California	13
Central California	7
Southern California	13
Race/Ethnicity	
Caucasian	21
Asian	4
Hispanic	4
African-American	2
Pacific Islander	1
Native-American	1
Current Position	
Teacher, regular classroom	21
Educational consultant	6
Curriculum specialist	3
District coordinator	3
Experience with Special Populations	
Credentialed in English as a second language	5
Others with experience teaching English learners	16
Credentialed in special education	5
Others with experience teaching special education	13
Years of Teaching Experience	
Minimum	3
Maximum	32
Average	16.4

The materials developed for use in the workshop included (a) the policy definitions of the different achievement levels, (b) the relevant California Content Standards, (c) item maps indicating the types of questions that students at each level can answer correctly, and (d) examples of performance level descriptions developed for National Assessment of Educational Progress (NAEP) and for assessments in other states. Each of these materials is described here followed by a discussion of the orientation and training provided to the participants and then the steps the panelists followed in drafting detailed performance level descriptors. More information on each of the workshop materials is provided in the panelist training materials included as Appendix C.

Workshop Materials

Policy definitions. At its October 2006 meeting, the SBE adopted general descriptions of what the different achievement levels are intended to mean. These are generic definitions; the same definitions apply to every subject and grade. Had we been developing PLDs to guide standard-setting, in other words as statements of what students should know and be able to do, these policy definitions would have provided guidance about *should*. In the present case, we developed the PLDs as descriptions of what students at the existing performance levels actually do know and are able to do. These policy definitions provided a general check on the reasonableness of the descriptions relative to the general guidelines for the performance levels, but did not play a central role in the initial development of the descriptors. The draft policy definitions are included in Appendix C.

Content standards. Panelists had access to the California Content Standards for their subject and relevant grades. During the alignment workshop, the panelists had reviewed each content standard and rated the depth-of-knowledge required to master the standard. We printed the target standard for each of the items in the item maps, so panelists did not often have to refer back to the overall standard documents.

Item maps. The primary working document used by the PLD panelists was the item map for their subject and grade. As described above, a sample of items were mapped onto the performance levels for each reporting category used with the assessment. The items were sorted by performance level within reporting category. The text of the item and response options was printed along with an information block that included the reporting category and targeted content standard and the percentage of students at each achievement level answering the item correctly. Each page included a footer indicating the reporting category and performance level of the associated test item. The information for each reporting category was stapled separately to permit easier manipulation by the panelists. The documents for each different reporting category were placed in a folder and each folder was assigned a unique sequence number. Panelists signed out each folder that they used and the workshop leader signed them back in when they were returned as a means of ensuring the security of the test material.

Sample performance descriptors. In a separate internally funded project, HumRRO collected and reviewed performance level descriptors for reading and mathematics used by several states and by NAEP. A draft analysis of different types of PLDs is included as Appendix D. Based on this review, HumRRO recommended a format that included both a general statement of the types of knowledge and skills demonstrated at each performance level together with a bulleted list of specific knowledge and skills associated with each major area (reporting category) covered by the assessment. After review and discussion with CDE and SBE staff, we incorporated this recommendation in the training materials included in Appendix C.

Another key outcome of HumRRO's review of different approaches to PLDs was an analysis of the different ways of indicating the progression of skills across performance levels within a grade and also across grades within a level. For example, higher performance levels may involve greater frequency or regularity in the performance of key tasks, a wider range of tasks, or increasing cognitive complexity (depth of knowledge) in the tasks performed. Results from these analyses were also included in the initial training provided to the panelists.

Orientation and Training

HumRRO provided an orientation and training briefing to panelists before they started drafting the PLDs. Where possible we provided this training the afternoon before the workshop began. In some cases, where alignment activities were still underway, the orientation was provided during breakfast the day of the workshop. The orientation covered (a) the purpose and nature of the PLDs; (b) a description of the workshop materials, particularly the item maps; (c) suggestions for PLD format and for different ways of showing progression across levels and grades; and (d) a description of the steps to be followed in drafting the PLDs. The slides used for this orientation and training session are included in Appendix C.

Steps in Developing the PLDs

The panelists began with a single grade and reporting category. They were first asked to review all of the items mapped to the *proficient* level and talk about the knowledge and skills required to answer these items. The panelists then turned to the items mapped to the *basic* level and developed descriptions of the knowledge and skills needed to answer these questions. Then the panelists developed descriptions for items at the *below basic* and *advanced* levels within this reporting category. After drafting initial reporting-category performance level descriptions for each of the performance levels, the panelists were encouraged to review and revise the descriptions to increase consistency and to consider alternative approaches and formats.

Initially, we suggested that panelists complete descriptions for each of the reporting categories for an assessment before proceeding to the next assessment. For the grade 2–8 ELA assessments, panelists generally preferred to develop descriptors for a single reporting category across all of the grades first, before moving to the next reporting category. Instructions were changed for the grade 2–7 mathematics

assessments to suggest this approach. For the end-of-course mathematics tests and for the history and science tests, the reporting categories varied across assessments, so it was preferable to complete all of the descriptors for a given assessment before moving to the next one, as originally intended.

As time permitted, when panelists completed descriptors for each reporting category in their assigned assessments, they were asked to go back and write general summaries of the knowledge and skills included in the more detailed descriptors. For some groups, time did not permit work on these summary statements, but each group did complete detailed descriptors for each assessment and reporting category.

Summary and Revision

Following the workshops, ETS content experts who worked with each of the assessments reviewed the materials developed by the panelists. The experts edited the detailed descriptions lightly to improve consistency and created overall summaries of the knowledge and skills required across all of the reporting categories. The revised descriptors were then sent to the panelists who were asked if the revisions reflected their initial judgments accurately and then reviewed by HumRRO's editor. These edited drafts became the formal descriptors we are recommending.

Chapter 3: Results from the PLD Development Workshops

Introduction

We present the results of this project in three sections, beginning with a discussion of the item maps. The second section discusses the PLD workshop and the drafts produced by the panelists. The chapter concludes with a description of how the initial drafts were revised to produce a complete draft of PLDs for consideration by CDE and the SBE.

Item Maps

Tables 4 through 7 show the number of items included in the item maps used by the panelists in the PLD workshops. Each table shows the number of reporting categories, the total number of items from the analysis provided by ETS, and the number sampled at each performance level for use in the PLD workshops. The counts for ELA exclude the writing-applications essays at grades 4, 7, and 10. The essays were scored using a 4-point scale so each question could map onto multiple performance levels. Descriptors of different levels of performance on the essays are already provided in the scoring rubrics for the essays. These descriptors were not duplicated in the PLDs reported here. The four score levels for each essay were not equivalent to the overall performance levels for the test, potentially leading to serious confusion. We provide a more detailed breakout showing the number of items at each performance level by reporting category in Appendix B.

Table 4. Number of Items Sampled for Use in the PLD Workshops by Grade and Performance Level: English-Language Arts

English-Language Arts								
	Grade							
Statistic / Performance Level	02	03	04*	05	06	07*	08	CAHSEE (10)*
Statistic	Number of Reporting Categories and Available Items							
Reporting categories	5	5	5*	5	5	5*	5	5*
Available items	131	124	173	157	153	173	146	209
Performance Level	Number of Items Sampled for Use in the PLD Workshops							
1. Far Below Basic**	1			1				**n/a**
2. Below Basic**	4	14	2	13	9	10	10	10
3. Basic	17	20	18	20	20	20	20	15
4. Proficient	20	20	20	20	20	17	17	14
5. Advanced	17	11	17	18	17	14	19	11
Total sampled	59	65	57	72	66	66	66	50
Percent of available	45%	52%	33%	46%	43%	38%	45%	24%
Items/category	11.8	13.0	11.4	14.4	13.2	13.2	13.2	10.0

* Essay questions for Grades 4, 7, and 10 writing-applications were not included in these item counts.
** The CSTs (Grades 2 through 8) have five performance levels. The CAHSEE has only one performance level below the Basic level (not pass). Item counts for this category are shown in the Below Basic row.

Table 5. Number of Items Sampled for Use in the PLD Workshops by Grade and Performance Level: Mathematics for Grades 2 through 7 and CAHSEE

Mathematics							
Statistic / Performance Level	Grade						CAHSEE (Grade 10)
	02	03	04	05	06	07	
Statistic	Number of Reporting Categories and Available Items						
Reporting Categories	4	4	4	4	4	4	5
Available Items	112	120	116	119	115	104	252
Performance Level	Number of Items Sampled for Use in the PLD Workshops						
1. Far Below Basic*	5	3	1	2	0	0	**n/a**
2. Below Basic*	15	14	9	10	5	4	14
3. Basic	11	14	14	12	15	9	20
4. Proficient	14	12	12	12	14	15	20
5. Advanced	14	14	13	14	16	13	18
Total sampled	59	57	49	50	50	41	72
Percent of available	52.7%	47.5%	42.2%	42.0%	43.5%	39.4%	28.6%
Items/category	14.8	14.3	12.3	12.5	12.5	10.3	14.4

* The CSTs (Grades 2 through 7) have five performance levels. The CAHSEE has only one performance level below the Basic level (not pass). Item counts for this category are shown in the Below Basic row.

Table 6. Number of Items Sampled for Use in the PLD Workshops by Grade and Performance Level: Mathematics for End-of-Course Tests

CST Mathematics End-of-Course Tests							
Statistic / Performance Level	Course						
	General Math	Algebra I	Geometry	Algebra II	Integrated Math I	Integrated Math II	Integrated Math III
Statistic	Number of Reporting Categories and Available Items						
Reporting categories	4	1	1	2	2	4	3
Available items	101	108	120	116	107	122	116
Performance Level	Number of Items Sampled for Use in the PLD Workshops						
1. Far Below Basic	0	0	1	0	0	0	0
2. Below Basic	4	2	2	6	5	5	8
3. Basic	6	6	6	6	10	11	8
4. Proficient	14	6	6	5	10	9	7
5. Advanced	16	6	6	10	10	11	12
Total sampled	40	20	21	27	35	36	35
Percent of available	39.6%	18.5%	17.5%	23.3%	32.7%	29.5%	30.2%
Items/category	10.0	20.0	21.0	13.5	17.5	9.0	11.7

Table 7. Number of Items Sampled for Use in the PLD Workshops by Grade and Performance Level: History and Science

CST History/Social Science and Science						
	History			Science		
	Grade			Grade		Life Science (10)
Statistic / Performance Level	08	10	11	05	08	
Statistic	Number of Reporting Categories and Available Items					
Reporting categories	5	5	5	4	6	6
Available items	148	115	124	79	34	30
Performance Level	Number of Items Sampled for Use in the PLD Workshops					
1. Far Below Basic**	0	0	0	0	0	0
2. Below Basic**	6	6	4	9	2	3
3. Basic	10	6	6	14	6	9
4. Proficient	10	6	6	14	6	5
5. Advanced	10	6	6	5	6	8
Total sampled	36	24	22	42	20	25
Percent of available	24.3%	20.9%	17.7%	53.2%	58.8%	83.3%
Items/category	18.0	24.0	22.0	10.5	20.0	12.5

Implications of the Item Maps. We were not entirely successful in selecting 3 or 4 items per reporting category (15 to 20 overall) at each performance level. For ELA, there were very few items in the assessments for grades 2 and 4 that below basic students could answer. This is not necessarily a problem from a measurement point of view; questions that basic students can answer but below basic students cannot are the most useful in distinguishing basic from below basic students. It does suggest some likely difficulty in distinguishing between below basic and far below basic students. What is curious is the unevenness of coverage of the below basic performance level across grades. There were plenty of questions that below basic students could answer on the assessments for grades 3 and 5.[3] The further implication of this unevenness is that panelists necessarily encountered difficulties in writing consistent descriptions of below basic performance on the ELA assessments for different grades. At some grades empirical results indicated what below basic students could do; at other grades they did not.

The grade 2–7 mathematics assessments included items that below basic students could answer and even, at the lower grades, a few that students at the far below basic level could answer. There were progressively fewer easy items in the higher grades. This could have resulted from an intentional plan by CDE or the test developers to focus on the lower end of the scale in the earlier grades, but concentrate more on the distinction between basic and proficient in the later grades.

A much more significant problem was the limited number of items available, at any performance level, for the science assessments for grades 8 and 10. Because

[3] For the Grade 3 assessment, there were plenty of easy items that students at the below basic level could answer, but relatively few items that could be answered only by students at the advanced level.

these were new assessments, we could provide the panelists with data from only one operational form, rather than four or more forms as was the case with the other assessments. The limited number of items for these assessments presented a particular challenge for the panelists. The approach that they took in response to this challenge is described in the next section.

Results from the PLD Workshops

The most important result from the PLD workshops held on November 30 and December 3, 2006 was that panelists could do the basic tasks required to draft PLDs. The panelists reviewed the items in the item maps for each reporting category and performance level. In every case, they reached a consensus about the knowledge and skills necessary to answer the items correctly. Completing this task took panelists a full day. In most cases there was little time left for the panelists to revise or summarize the detailed descriptions that they produced.

The panelists were inventive in performing the required tasks. We had initially suggested that the panelists work grade –by grade. The ELA tests all use the same report categories, with the exception of an addition – the writing applications category, for the grades at which the essay is administered. The panelists working on the ELA assessments for grades 2 through 4 started with the Grade 4 reading comprehension questions. After drafting descriptions of the knowledge and skills assessment by the items at each performance level, they chose to work with the reading comprehension items at the other grades before moving on to items in other reporting categories. This approach appeared to lead to greater consistency in the detailed descriptions across grades. When the second panel met to draft PLDs for mathematics and history, we reorganized the shells for the mathematics PLD drafts for grades 2 through 7 by reporting category rather than by grade. The history tests and the end-of-course mathematics test each had different reporting categories, so the panelists necessarily worked on one grade at a time.

The various panels also differed in their approach to showing the progression of knowledge and skills from one performance level to the next. In part this variation reflected the dissimilar content of the various subjects. In some cases, the panels chose to indicate variations in frequency in the text that preceded the bullet lists for each reporting category. At the lower levels, the panelists listed skills that the students sometimes demonstrated, whereas at the advanced level they listed skills that students nearly always demonstrated. In some cases, this was a creative response to the problem posed by having very few items mapped to the lower levels.

In some instances, the panelists let the progression flow from differences in the types of items that students at each level could answer. Sometimes this mapped onto greater cognitive depth, progressing from recognizing the answer to higher levels of problem solving. In other cases, such as history, items at the higher levels involved less commonly known facts as well as a greater depth of understanding needed in order to answer the questions.

The panelists working on science PLDs demonstrated the greatest creativity in responding to the challenges posed by the very limited number of items in the item maps. Fortunately or unfortunately, we started in the middle with Grade 8 science, the test for which the fewest items were available. For the first reporting category, Earth in the Solar System, there were only two items, one mapped to the Basic level and one that was actually just beyond the advanced level. In order to write something about the proficient level for this reporting category, the panelists looked at the proportion of proficient students answering each of these two questions correctly (included in the item header information) and made a judgment about the frequency with which proficient students demonstrated the skills necessary to answer each of the questions correctly. While it is not clear that these frequency-based descriptions will provide clear reporting results, this approach did enable the panel to draft descriptions for every performance level, even when there were no items in a reporting category mapped to that level.

Revision of the Initial Drafts

After the workshops were completed, we turned to content experts at ETS responsible for the CSTs and CAHSEE for help in editing and summarizing the drafts that the panelists produced. ETS drafted cross-category summaries of the panelists' detailed knowledge and skill lists for three of the tests and we reviewed and discussed these summaries with content experts at CDE. Based on these discussions, ETS experts drafted summary PLDs for each of the other tests.

In addition to creating overall summaries, the ETS content experts also edited the detailed lists for consistent grammar, syntax, and terminology. In some cases, the more detailed lists were shortened by reducing or eliminating the descriptions of skills judged to be less central to the target content standards. The revised performance level descriptors were sent to the original panelists for their review and comment. A clear majority of the panelists reported that the revisions reflected their original judgments accurately. Several panelists suggested additional edits and revisions. Finally, the HumRRO editor reviewed the descriptors after panelists' suggestions were incorporated. The PLDs resulting from this process are presented in Appendix A.

Next Steps

The current drafts include two levels of detail, summary statements, and more detailed descriptions of knowledge and skills associated with each reporting category. It is important to note that the descriptors provide empirically-based examples of what students at each performance level know and can do. They do not comprehensively cover all of the individual content standards. In many cases, there was no empirical evidence that indicated a relationship between mastering an objective and a specific level of performance. The limited number of test questions for which empirical data are currently available presented particular problems for the science assessments. CDE may wish to revise these initial descriptors when additional empirical data become available.

We recommend that, perhaps with further editing, the summary statements be used in reporting test results to students and parents. The more detailed descriptions should provide useful information for teachers and for students and parents seeking additional information on a student's current skills and the skills that need to be mastered to reach the next performance level. The detailed description of the student's current performance level summarizes what the student is likely to know and be able to do now. The description for the next higher performance level will suggest the skills to be worked on next.

One further step that remains to be completed is to add exemplar items to illustrate student skills in different content areas at each performance level. HumRRO has providing CDE with copies of the items reviewed by the panelists for each test, sorted by performance level within each reporting category. After secure items are removed, the remaining items provide the exemplars needed to illustrate the PLDs reported here. In addition, ETS may amend their procedures for releasing test questions to provide performance level links for each released item, providing an expanded pool of exemplars as additional items continue to be released.

After further review and comment, the SBE must formally adopt the PLDs. SBE adoption is scheduled for March 2007 in the NCLB compliance plan that California submitted to USDE. Such action also will communicate clearly that the Board finds the descriptors consistent with the California Content Standards and encourages their use in interpreting STAR and CAHSEE test results. The PLDs adopted by the Board must be made available, most likely through CDE's Web site. HumRRO strongly recommends further refinement of the summaries for use in reporting results for individual students.

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Appendix A
Recommended Performance Level Descriptors

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English-Language Arts

Descriptions for Grade 2 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade two at the **advanced** level read with full understanding a variety of grade-appropriate texts. They understand complex written directions, infer main ideas, understand characterization, and synthesize information from a chart with information in a text. Advanced second grade students also possess a variety of foundational English language skills, including determining the meaning of multiple-meaning words, dividing words into syllables, spelling, and use of complete sentences. Advanced students also understand the concept of topic sentences and the use of details to develop ideas.

Proficient

Students in grade two at the **proficient** level read with understanding a variety of grade-appropriate texts. They determine main ideas, cause and effect relationships, and purpose in informational texts, and they understand basic aspects of characterization in literary texts. Proficient students demonstrate a good grasp of many foundational English language skills: they recognize the meaning of compound words, understand basic letter-sound correspondences, know common suffixes, and determine the meaning of frequently occurring multiple-meaning words. Proficient second grade students know common punctuation and capitalization rules and can identify incomplete sentences. They also understand the main focus of a paragraph and can add appropriate details to develop ideas.

Basic

Students in grade two at the **basic** level read grade-appropriate texts with some understanding and recognize explicit information, including main ideas and cause and effect, within texts. They recall relevant details explicitly stated in informational text and can identify the setting of a literary text. Students at the basic level show evidence of emerging skills in the English language: they know some common letter-sound correspondences, rhymes, prefixes, abbreviations, and rules for spelling, punctuation, and capitalization. They also may understand the purpose of common reference tools such as atlases and dictionaries.

Below Basic

Students in grade two at the **below basic** level may read grade-appropriate texts with some understanding and recognize explicit information, including recalling details or main events. They demonstrate an understanding of simple English language skills, including recognizing common abbreviations, forming regular plurals, and using apostrophes in contractions.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:

- Identify the meaning of multiple meaning words in context.
- Correctly divide polysyllabic words into syllables.
- Identify number of syllables in polysyllabic words.
- Know irregular plural noun constructions.

Proficient students:

- Use knowledge of common suffixes and grade-appropriate vocabulary to determine word meaning in context.
- Analyze compound words to determine meaning.
- Know letter-sound correspondence of long vowel sounds, including diphthongs.
- Use context clues to determine meaning of frequently occurring multiple-meaning words.

Basic students:

- Use context clues to identify common antonyms.
- Know common prefixes.
- Know letter-sound correspondences of long vowel sounds (including special vowel spellings).
- Know common abbreviations (days of the week).

Below basic students:

- Classify common words into categories.
- Know common abbreviations (months of the year, Dr., Mr., Mrs., Ms.).
- Know to add *s* to make regular plural nouns.

Specific Descriptors: Reading Comprehension

Advanced students:

- Comprehend complex written directions.
- Interpret and synthesize information from charts.
- Make inferences to determine author's purpose.

Proficient students:

- Use table of contents to locate information.
- Determine main idea and purpose of functional text.
- Locate relevant information in text.
- Infer cause and effect in informational text.

Basic students:

- Recognize explicitly stated cause and effect relationships in text.
- Use a table of contents to locate information.
- Comprehend explicit written directions.
- Recall relevant details from text.

Below basic students:

- May comprehend explicit written directions.
- May recall relevant details from text.

Specific Descriptors: Literary Response and Analysis

Advanced students:

- Infer character traits from clues in the text and compare characters across texts.
- Identify alternate endings to a story using both new and included information.

Proficient students:

- Compare the actions of characters across texts.
- Identify alternate endings to a story using both new and included information.
- Identify rhyming words in poetry.

Basic students:

- Identify rhyming words.
- Compare the settings of different stories.

Below basic students:

- May identify rhyming words.
- May recognize the setting of a story.

Specific Descriptors: Written Conventions

Advanced students:

- Identify and distinguish complete and incomplete sentences.
- Recognize the correct spelling of frequently occurring words.
- Identify verbs and nouns within context.

Proficient students:

- Use quotation marks in dialogue correctly.
- Distinguish complete from incomplete sentences.
- Identify correct use of capital letters with proper nouns, including months, days, and holidays.

Basic students:

- Know how to place commas within a series.
- Recognize incorrect spelling for frequently occurring words.
- Spell irregular words correctly.
- Identify appropriate use of capitals in proper nouns.

Below basic students:

Identify correct use of apostrophes in contractions.

Specific Descriptors: Writing Strategies

Advanced students:

- Select a topic sentence within a passage.
- Revise and improve text by adding descriptive sentences.
- Understand and use a dictionary.

Proficient students:

- Understand the focus of a narrative.
- Add descriptive details to improve writing.
- Understand the purpose of an atlas.

Basic students:

- Identify ideas that represent a consistent focus.
- Understand the purpose of common reference documents.

Below Basic students:

- May identify ideas that represent a consistent focus.
- May understand the purpose of common reference documents.

Descriptions for Grade 3 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade three at the **advanced** level can read and fully understand grade-appropriate informational and literary texts. They can also analyze aspects of the text as a whole, such as identifying the genre of the text and making logical predictions based on information within the text. They use text clues to infer the traits of fictional characters. Advanced students have an excellent grasp of foundational English language skills, including knowledge of vocabulary, punctuation, subject-verb agreement, and sentence structure.

Proficient

Students in grade three at the **proficient** level read and understand grade-appropriate informational and literary texts. They respond accurately to questions based on literal information in the text; they use text features to locate information; they understand the main events of the plot, and they use text clues to determine character traits. Proficient students also have a good grasp of foundational English language skills, including knowledge of word families, grade-level vocabulary, and common suffixes. They also understand the fundamentals of punctuation and sentence and paragraph structure.

Basic

Students in grade three at the **basic** level understand explicit aspects of grade-appropriate informational and literary text. They comprehend written directions and use details from the text to answer literal questions. They can identify the main problem and its solution in basic narrative texts and differentiate between reality and fantasy. Students at the basic level show evidence of emerging language skills: they know simple suffixes, understand many homophones, identify complete sentences, identify compound words, and know a variety of spelling and capitalization rules.

Below Basic

Students in grade three at the **below basic** level understand simple grade-appropriate literary and informational texts. They follow explicit written directions, recognize sequential steps, identify explicitly stated main events in a plot, and identify character traits based on clear text clues. They demonstrate a limited set of English language skills. The English language skills of students at this level include identifying rhymes, recognizing some antonyms, using context clues to determine the meaning of common words, using verb tenses correctly, and using simple spelling and capitalization rules.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:

- Understand the foundational principles of phonics.
- Know a wide variety of synonyms and antonyms.
- Understand categories of words and levels of specificity.
- Use context clues to identify the correct homophone.

Proficient students:

- Identify word relationships (antonyms).
- Know the meaning of and use common suffixes.
- Classify words according to categories.
- Use knowledge of word families to form new words.

Basic students:

- Use knowledge of common suffixes and grade-appropriate vocabulary to determine word meaning in context.
- Recognize rhyming words.
- Determine correct use of homophones.

Below basic students:

- Know the meaning of common suffixes.
- Recognize common antonyms for grade level vocabulary and below.
- Use context clues to determine the meaning of simple words.
- Correctly divide words into syllables.

Specific Descriptors: Reading Comprehension

Advanced students:

- Comprehend and interpret complex written directions.
- Identify relevant supporting details.
- Identify the genre of a text.
- Use information from the text to make logical predictions.

Proficient students:

- Use relevant details from text to answer literal questions about the text.
- Use text features (subheadings) to locate information in informational text.
- Relate text to prior knowledge.

Basic students:

- Use text features (index) to locate information.
- Comprehend and apply explicit written directions.
- Recognize the problem and its solution in a folktale.
- Use relevant details from text to answer literal questions about the text.

Below basic students:
- Follow explicit written directions.
- Recognize sequential steps.

Specific Descriptors: Literary Response and Analysis

Advanced students:
- Understand the relationship among events in the plot.
- Infer the underlying theme in fictional texts.
- Use text clues to determine character traits and also the traits of the narrator in poetry.

Proficient students:
- Identify the main events of the plot.
- Identify the underlying theme in fictional texts.
- Use text clues to determine character traits.

Basic students:
- Identify the main events of plot.
- Recognize the underlying theme of a folktale.
- Understand the difference between fiction and nonfiction.

Below basic students:
- Identify rhyming words.
- Identify explicitly stated main events from the plot.
- Determine clearly delineated character traits.

Specific Descriptors: Written Conventions

Advanced students:
- Identify subjects and verbs correctly.
- Use commas between city and state.
- Identify the correct punctuation for the title of a book.

Proficient students:
- Place commas in a series.
- Identify and use verb tense correctly within context.
- Distinguish between complete and incomplete sentences.

Basic students:
- Identify a complete sentence.
- Correctly spell one-syllable words that require double consonants before an affix.
- Identify correct capitalization for proper nouns.

Below basic students:

- Correctly spell simple compound words.
- Use verb tense correctly within context.
- May identify appropriate subject-verb agreement.
- May use capital letters correctly in proper nouns.

Specific Descriptors: Writing Strategies

Advanced students:

- Revise sentences to create a logical progression of ideas.
- Recognize appropriate topic and concluding sentences for a paragraph.

Proficient students:

- Add supporting details to help develop an idea.
- Identify appropriate terms to signal a conclusion.
- Identify an appropriate topic sentence for a complex paragraph.
- Understand uses of common references (encyclopedia).

Basic students:

- Identify a compound sentence.
- Recognize a topic sentence of a simple paragraph.
- Identify a single supporting detail.

Below basic students:

- May recognize a topic sentence of a simple paragraph.
- May identify an appropriate supporting detail.

Descriptions for Grade 4 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade four at the **advanced** level demonstrate excellent comprehension of implicit and explicit features of grade-appropriate texts. They synthesize information within and across texts, infer the author's purpose in informational text, and distinguish cause and effect. Advanced students also possess a wide variety of English language skills, including using context to determine shades of meaning, understanding figurative language, identifying topic sentences, improving text by adding appropriate details, and using correct punctuation in less common situations.

Proficient

Students in grade four at the **proficient** level demonstrate a good understanding of implicit and explicit features of grade-appropriate texts. They follow written instructions, compare information within and across texts, identify the main events of a plot, and understand character. Proficient students also demonstrate knowledge of synonyms and multiple-meaning words, audience and purpose for writing, use of details to develop ideas, and a variety of spelling, punctuation, and capitalization rules.

Basic

Students in grade four at the **basic** level demonstrate understanding of explicit features of grade-appropriate text, such as recalling key details, contrasting information within and across texts, and comparing characters in different texts. Basic students also draw conclusions regarding implicit features of texts: they distinguish between reality and fantasy, and they predict content based on the title. Language skills demonstrated by basic students include using root words, identifying synonyms for words in context, determining the purpose for writing, and using simple written conventions.

Below Basic

Students in grade four at the **below basic** level demonstrate an understanding of some explicitly stated aspects of grade-appropriate texts, including the topic of the text. The English language skills of below basic students include such abilities as identifying the meaning of frequently occurring words in context and recognizing the correct use of apostrophes in contractions.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:

- Use context to make fine distinctions among synonyms and multiple meanings of complex words.
- Find the meaning of rare words using context clues.
- Determine the meaning of an idiom in context.
- Determine word relationships, including antonyms, synonyms, idioms, and metaphors.

Proficient students:

- Use a thesaurus to choose an appropriate synonym.
- Find the meaning of multiple-meaning words in context.
- Choose a synonym for a grade-appropriate word.

Basic students:

- Find the meaning of a frequently occurring multiple-meaning word in context.
- Use the root word to find meaning.
- Identify meaning of Latin-root words from words presented in context.
- Identify synonyms of a word presented in context.

Below basic students:

- Identify the meaning of monosyllabic frequently occurring words in context.

Specific Descriptors: Reading Comprehension

Advanced students:

- Synthesize information across texts.
- Distinguish cause and effect in expository text.
- Analyze text to determine sequence.
- Evaluate text information to infer author's purpose.

Proficient students:

- Follow multi-step written instructions.
- Use text to make logical predictions.
- Compare and contrast information across texts.

Basic students:

- Predict content based on title.
- Gather and compare information from multiple texts.
- Distinguish between reality and fantasy.

Below basic students:

- May determine the main topic of a text.

Specific Descriptors: Literary Response and Analysis

Advanced students:
- Understand the relationships among events in the plot.
- Determine motivations of characters.
- Understand features of genres.

Proficient students:
- Identify main events from the plot.
- Locate text evidence to support understanding of character.
- Compare actions and traits of characters across texts.
- Identify the genre of a literary text.

Basic students:
- Determine meaning of idioms
- Recall key details.
- May compare character development across passages.
- Make literal comparisons of characters across text.

Below basic students:
- May recall key details.

Specific Descriptors: Written Conventions

Advanced students:
- Identify correct punctuation in direct quotations.
- Identify correct use of quotation marks in titles.
- Identify incorrect spelling of high frequency grade-level polysyllabic words.

Proficient students:
- Combine sentences using prepositional phrases.
- Identify the correct use of conjunctions.
- Recognize the incorrect spelling of irregular plurals.
- Identify correct capitalization of proper nouns.

Basic students:
- Identify correct use of apostrophes in contractions.
- Combine compound sentences using appropriate conjunctions.
- Use knowledge of spelling patterns to identify incorrectly spelled words.

Below basic students sometimes:
- Identify correct use of apostrophes in contractions.

Specific Descriptors: Writing Strategies

Advanced students:

- Identify an appropriate topic sentence.
- Improve text by adding details.
- Know the parts of a bibliography.

Proficient students:

- Select appropriate details to develop ideas.
- Determine purpose and audience for writing.
- Use table of contents to locate information.

Basic students:

- Determine the purpose for writing.

Below basic students sometimes:

- Determine the purpose for writing.

Descriptions for Grade 5 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade five at the **advanced** level comprehend a wide variety of grade-appropriate literary and informational texts. They demonstrate a full understanding of the essential message of texts, draw accurate inferences, and make connections among related ideas. Advanced students also have excellent English language skills as appropriate to grade five. They demonstrate an understanding of word origins, affixes, precise use of words, and less common grammatical conventions, and they show an understanding of organizational structure in essays.

Proficient

Students in grade five at the **proficient** level demonstrate a good understanding of grade-appropriate literary and informational texts. They grasp key ideas, including main ideas, theme, character traits, elements of plot, and purpose of text features. Proficient students also have grade-appropriate English language skills, including knowledge of synonyms, antonyms, and root words. They demonstrate an understanding of common grammatical conventions, sentence structure, and revisions to sentences for clarity and style.

Basic

Students in grade five at the **basic** level comprehend simple aspects of grade-appropriate literary and informational texts. They demonstrate an understanding of explicit aspects of texts, including the steps in a process and the stated author's purpose. The English language skills of students at this level include identifying synonyms using context, recognizing simple grammatical and punctuation conventions, and identifying appropriate topic and concluding sentences.

Below Basic

Students in grade five at the **below basic** level comprehend simple aspects of grade-appropriate literary and informational texts. They demonstrate an understanding of explicitly stated aspects of texts, such as the major topic or problem. The English language skills of students at this level include determining the meaning of multiple-meaning words from context, and recognizing simple punctuation and spelling conventions.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:
- Use knowledge of affixes to determine word meaning.
- Use word origins to analyze the meaning of complex words.

Proficient students:
- Demonstrate knowledge of idioms.
- Apply knowledge of synonyms and antonyms.

Basic students:
- Use provided word origins to determine meaning.
- Interpret idioms in context.
- Identify synonyms in context.

Below basic students:
- Identify the meaning of a multiple-meaning word in context.
- Use simple affixes to determine word meaning.

Specific Descriptors: Reading Comprehension

Advanced students:
- Make comparisons and connections across texts and among ideas.
- Analyze a part of a sequence that is not explicitly stated.
- Distinguish fact from opinion in complex texts.

Proficient students:
- Determine the main idea.
- Understand and use text features.
- Locate key terms within the text.
- Identify author's purpose.

Basic students:
- Identify aspects of text presented explicitly, including main ideas and comparisons.
- Recognize sequential steps.
- Identify author's purpose.

Below basic students:
- Use a timeline or other simple text feature to locate information.

Specific Descriptors: Literary Response and Analysis

Advanced students:
- Understand and identify aspects of poetry, including speaker and tone.
- Understand and evaluate characters' motives.
- Infer and analyze the meaning of symbols and other figurative elements of text.

Proficient students:
- Understand the events of a plot, including causal relationships.
- Determine literary themes.
- Identify settings.
- Compare character traits across texts.
- Infer the meaning of symbols and other figurative elements of text.

Basic students:
- Understand character traits and make simple comparisons.
- Identify the problem and its solution in fictional texts.
- Identify the meaning of a symbol.

Below basic students:
- Recognize the main problem in a plot.
- Identify a simile.

Specific Descriptors: Written Conventions

Advanced students:
- Use transitional words correctly.
- Use complex spelling patterns to identify correct spelling of words.
- Use a colon to introduce a list.

Proficient students:
- Combine sentences accurately.
- Identify correct use of independent and dependent clauses.
- Capitalize less common proper nouns.

Basic students:
- Identify correct use of quotation marks for dialogue.
- Recognize incorrectly spelled frequently occurring words.
- Identify correct sentence structure.
- Recognize correct verb tense.

Below basic students:

- Capitalize proper nouns.
- Use colons to separate hours and minutes.
- Use coordinate conjunctions to combine sentences correctly.
- Use spelling patterns to identify incorrectly spelled words.

Specific Descriptors: Writing Strategies

Advanced students:

- Choose precise words to clarify meaning.
- Use a bibliography to locate relevant information.
- Identify appropriate transitional sentences to link paragraphs.

Proficient students:

- Identify the correct summary that could conclude an essay.
- Determine appropriate strategies for developing ideas.
- Choose appropriate revisions for clarity and style.

Basic students:

- Use bibliographic references to determine text genre.
- Identify topic and concluding sentences for an essay.
- Combine simple sentences using conjunctions.

Below basic students:

- Use a thesaurus to identify an appropriate synonym.

Descriptions for Grade 6 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade six at the **advanced** level use a variety of critical thinking skills to understand and analyze grade-appropriate literary and informational texts. They draw connections among ideas, analyze the author's support for an idea, evaluate the use of rhetorical and poetic devices, determine the underlying organization of texts, and evaluate the intended effect of information on the reader. Students at the advanced level also demonstrate strong English language skills, including using the context to determine the meaning of unfamiliar words, understanding shades of word meaning, determining kinds of figurative language, and combining sentences effectively.

Proficient

Students in grade six at the **proficient** level demonstrate understanding of the essential message of grade-appropriate literary and informational texts. They identify and connect main ideas to related topics, apply information gained from reading to other contexts, and summarize support for a conclusion. They also demonstrate understanding of key aspects of literary texts, including literary genres and their characteristics, setting, point of view, and theme. Students at the proficient level also possess important English language skills, including using context to determine the meaning of words, identifying the meaning of foreign words used frequently in English, using the concepts of coordination and subordination, identifying appropriate support to develop an idea, and applying common rules of written English conventions.

Basic

Students in grade six at the **basic** level demonstrate understanding of some aspects of grade-appropriate literary and informational texts. They may identify main ideas, identify support for an author's conclusion, determine the difference between fact and opinion or fantasy, identify the speaker, determine genres, and recognize literary devices. Students at the basic level demonstrate English language skills such as using explicit context clues to determine meaning, finding correct transitions between paragraphs, and applying simple rules for punctuation, spelling, and capitalization.

Below Basic

Students in grade six at the **below basic** level demonstrate limited understanding of grade-appropriate literary and informational texts. They may identify explicitly stated main ideas, recognize the difference between fact and opinion or fantasy, identify the speaker, recognize genres, and recognize literary devices. Students at this level demonstrate English language skills such as using explicit context clues to determine the meaning of common words and applying basic punctuation, spelling, and capitalization rules.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:
- Use the context to verify and define complex and unfamiliar word meanings .
- Understand shades of meaning.
- Understand the use of figurative language.

Proficient students:
- Use the context to define words with multiple meanings.
- Understand the meaning of foreign words in English.

Basic students:
- Use context clues to define the meaning of commonly used words.
- Understand the meanings of commonly used foreign words in English.

Below basic students:
- Use context clues to understand the meaning of simple multiple-meaning words.
- May understand the meanings of commonly used foreign words in English.

Specific Descriptors: Reading Comprehension

Advanced students:
- Synthesize texts and evaluate them for use of rhetoric.
- Connect main ideas to other sources and related topics.
- Analyze the support for an author's conclusion.
- Apply and use information from the text.

Proficient students:
- Understand the organization and purpose of texts.
- Identify main ideas and relate them to other sources and topics.
- Summarize the support for an author's conclusion.

Basic students:
- Demonstrate a limited understanding of the organization and purpose of texts.
- Identify main ideas.
- Identify some support for an author's conclusion.

Below basic students:
- May understand aspects of the organization and purpose of texts.
- May identify the main idea or topic of text.

Specific Descriptors: Literary Response and Analysis

Advanced students:

- Engage critical thinking skills to evaluate literary texts.
- Understand the characteristics of different genres of fiction.
- Analyze key aspects of literary text, including point of view, setting, and theme.
- Identify poetic devices and determine their effect on tone and meaning.

Proficient students:

- Identify the forms of fiction and characteristics that distinguish them.
- Understand aspects of literary text, including point of view, setting, and theme.
- Identify and analyze the difference between fact and opinion or fantasy.
- Identify and use poetic devices

Basic students:

- Identify the speaker.
- Identify the forms of fiction and know some of the characteristics that distinguish them.
- Identify some literary devices.
- Identify poetic devices.

Below basic students:

- Determine the difference between fact and opinion or fantasy.
- Identify the forms of fiction.

Specific Descriptors: Written Conventions

Advanced students:

- Evaluate sentences for the most effective way of combining them.
- Understand and apply the concepts of coordination and subordination.
- Apply a wide variety of punctuation and spelling rules.

Proficient students:

- Understand the concepts of coordination and subordination.
- Capitalize words correctly in a variety of situations.
- Spell most grade-appropriate words correctly.

Basic students:

- Punctuate sentences correctly.
- Capitalize commonly used words correctly.
- Spell frequently misspelled words correctly.

Below basic students:

- Capitalize proper nouns correctly.
- Identify correctly spelled frequently occurring words.
- Recognize basic verb agreement.
- Identify correct punctuation.

Specific Descriptors: Writing Strategies

Advanced students:

- Synthesize information.
- Evaluate information for its intended impact on the reader.
- Identify the organizational structure of text.

Proficient students:

- Identify the kind of support appropriate to develop an idea.
- Choose the form of writing that suits the purpose.
- Use organizational features of electronic text to locate information.
- Link the conclusion to the key ideas of the text.

Basic students:

- Include some supporting details appropriate to develop an idea.
- Choose the form of writing that suits the stated purpose.
- Identify connections between paragraphs.

Below basic students:

- May use keywords to locate information.

Descriptions for Grade 7 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade seven at the **advanced** level use their understanding of literary and informational texts to analyze relationships in the text, synthesize ideas, and draw logical conclusions. Advanced students draw on an excellent foundation of English language skills in both reading and writing: they use context clues to define unfamiliar words, use appropriate sentence structures, make correct connections between paragraphs, and apply complex punctuation rules.

Proficient

Students in grade seven at the **proficient** level demonstrate their understanding of literary and informational texts by identifying organization and purpose, determining the support for an argument, and analyzing such characteristics of literary text as point of view, plot, and theme. Proficient students know and use a variety of English language skills, including using context to determine meaning, identifying details that support an argument, placing modifiers correctly, and using words precisely.

Basic

Students in grade seven at the **basic** level demonstrate a limited understanding of literary and informational texts, but they are able to identify some organizational structures, determine explicitly stated cause and effect, recognize some support for an argument, and identify characteristics of literary text such as the main events of a plot, the identity of the speaker, and genre. Students at this level demonstrate a grasp of simple English language skills, including using explicit context clues to find the meaning of common words, identifying root words, and applying common rules of grammar and punctuation.

Below Basic

Students in grade seven at the **below basic** level demonstrate some understanding of literary and informational texts. They may recognize the organization and purpose of informational materials, identify explicit cause and effect relationships, recognize character traits, and identify events of a plot. Students at this level have limited English language skills, but they may know the meaning of common idioms, identify misspelled words, recognize correct use of simple punctuation, and correctly link ideas within a sentence.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:
- Verify and define complex word meanings within context.

Proficient students:
- Determine word meanings by using context clues.
- Identify common idioms.

Basic students:
- Use explicit context clues to determine the meaning of words.
- Recognize root words and frequently used word origins.
- Apply metaphors in common usage.

Below basic students:
- Identify frequently used idioms in context.
- Identify common Latin root meanings.

Specific Descriptors: Reading Comprehension

Advanced students:
- Demonstrate a full understanding of the organization and purpose of informational materials.
- Synthesize and evaluate text to infer both cause and effect and author's argument.
- Draw logical conclusions from a full understanding of the text.

Proficient students:
- Understand the organization and purpose of informational materials.
- Identify cause and effect relationships in informational text.
- Evaluate the support of an author's argument.

Basic students:
- Demonstrate a limited understanding of the organization and purpose of informational materials.
- Identify cause and effect relationships in informational text.
- Identify some support of an author's argument.

Below basic students:
- May recognize the organization and purpose of informational materials.
- Identify simple, explicit cause and effect relationships in informational text.

Specific Descriptors: Literary Response and Analysis

Advanced students:

- Synthesize and evaluate the meaning of literary elements in narratives, including characterization, plot, point of view, and theme.

Proficient students:

- Identify and analyze the structural characteristics and purposes of different forms of prose.
- Analyze characterization through the thoughts, speech, and actions of characters.
- Understand point of view and its effects.
- Analyze events that move the plot forward.
- Identify and analyze recurring themes.

Basic students:

- Identify the structural characteristics and purposes of different forms of prose.
- Infer character traits from the thoughts, speech, and actions of characters.
- Identify point of view.
- Recognize events that move the plot forward.

Below basic students:

- Identify different forms of prose.
- Recognize clearly delineated traits of characters.
- Identify events of the plot.

Specific Descriptors: Written Conventions

Advanced students:

- Evaluate sentences for the most effective structure.
- Identify parts of speech according to the use of words in sentences.
- Apply complex punctuation rules.

Proficient students:

- Place modifiers properly.
- Apply suffixes to base words.

Basic students:

- Place commas after dependent clauses.
- Edit for correct grammar.
- Use correct capitalization.

Below basic students:

- May identify misspelled words.

Specific Descriptors: Writing Strategies

Advanced students:

- Synthesize and evaluate ideas.
- Determine the intended impact of word choice on the reader.
- Understand connections between paragraphs.

Proficient students:

- Evaluate a citation according to a sanctioned format.
- Choose information best suited to support a statement or claim.
- Choose words with precise meanings.

Basic students:

- Select strategies to organize information.
- Identify topics of informational text.
- Understand connections within paragraphs.

Below basic students:

- Identify logical ideas.
- Link ideas within a sentence.

Descriptions for Grade 8 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade eight at the **advanced** level consistently grasp the essential message of literary and informational texts and also analyze features of the text as a whole. They infer main ideas and underlying themes, understand the structure of both informational and literary texts, analyze literary elements, and synthesize ideas within and between texts. Advanced students also possess an excellent command of English language skills: they develop thesis statements, use sophisticated sentence structures, and apply complex rules of written conventions.

Proficient

Students in grade eight at the **proficient** level demonstrate a good understanding of literary and informational texts. They understand the organization and structure of various texts, determine main ideas, summarize information, and understand key literary elements such as characterization, plot, and theme. The English language skills of proficient students include an understanding of word origins, sentence structure, and the relationships among ideas in a written composition.

Basic

Students in grade eight at the **basic** level demonstrate a limited understanding of literary and informational texts: they identify explicitly stated main ideas, recognize appropriate summaries, identify the main events of the plot, and understand aspects of characterization. The English language skills of students at this level include using context to find the meaning of multiple-meaning words, identifying misspelled words, applying basic grammar rules, and identifying support for general statements.

Below Basic

Students in grade eight at the **below basic** level demonstrate little understanding of the essential meaning of literary and informational texts, but they may identify explicitly stated main ideas and the main events of a plot, understand the general organization of a text, and recognize character traits. The English language skills of students at this level may include knowledge of root words and simple grammar rules. Students also may identify an appropriate word choice and link ideas within sentences and between paragraphs.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:
- Use a knowledge of root words, word origins, and context to find the meaning of words.

Proficient students:
- Understand common origins of words.

Basic students:
- Understand common idioms.
- Use context to find the meaning of multiple-meaning words.

Below basic students:
- May use a knowledge of root words to recognize the meaning of words.

Specific Descriptors: Reading Comprehension

Advanced students:
- Synthesize information within and between texts.
- Evaluate text to determine structure and find information.

Proficient students:
- Understand the organization and purpose of informational materials.
- Identify main ideas.
- Accurately summarize information.

Basic students:
- Demonstrate a limited understanding of the organization and purpose of informational materials.
- Identify explicitly stated main ideas.
- Recognize appropriate summaries of information.

Below basic students:
- May understand the organization and purpose of informational materials.
- May identify explicitly stated main ideas.

Specific Descriptors: Literary Response and Analysis

Advanced students:
- Analyze the structural characteristics and specific purposes of different forms of poetry.
- Analyze the structural elements of plot, including conflict and resolution.
- Compare motivations and reactions of characters.
- Analyze recurring themes.
- Identify and interpret literary devices.

Proficient students:

- Identify the structural characteristics and purposes of different forms of poetry.
- Recognize the structural elements of plot and determine the ways conflicts are resolved.
- Compare motivations and reactions of characters.
- Identify recurring themes.
- Identify and interpret literary devices.

Basic students:

- Identify the structural characteristics and purposes of different forms of poetry.
- Identify the main events of the plot.
- Compare traits of characters.
- Identify some literary devices.

Below basic students:

- May identify the main events of the plot.
- May recognize character traits.
- May identify literary devices.

Specific Descriptors: Written Conventions

Advanced students:

- Understand correct sentence structures.
- Know and apply spelling and grammar rules.

Proficient students:

- Recognize parallel structure.
- Identify the correct spelling of words.

Basic students:

- Identify misspelled frequently used words.
- Recognize the best-written sentence.
- Identify the application of basic grammar rules.

Below basic students:

- May identify the application of basic grammar rules.

Specific Descriptors: Writing Strategies

Advanced students:

- Synthesize information to determine a thesis.
- Evaluate the intended effect of information on the reader.

Proficient students:

- Maintain a consistent point of view throughout a passage.
- Analyze supporting details and connect them to a thesis or conclusion.
- Establish connections within sentences and between paragraphs.

Basic students:

- Select an organizational pattern consistent with the purpose of a writing task.
- Identify support for a thesis or conclusion.
- Identify connections within sentences and between paragraphs.

Below basic students:

- May identify an appropriate word choice.
- May link ideas within sentences and between paragraphs.

Descriptions for Grade 10 ELA Performance Levels

Summary-Level Descriptors

Advanced

Students in grade ten at the **advanced** level comprehend explicit and implicit aspects of grade-appropriate text. They read informational and literary text with full understanding, evaluating the structure, the author's intent, the development of time and sequence, and the intended effect of literary devices. Advanced students demonstrate a full command of written English conventions and important writing strategies. They understand figurative language, use parallel structure and active voice, and use thesis statements and conclusions to unify writing.

Proficient

Students in grade ten at the **proficient** level demonstrate a good understanding of explicit and implicit aspects of grade-appropriate text. They understand the organization, structure, and purpose of informational text. When reading literary text, they analyze genre, plot, theme, and characterization. Proficient students have a wide variety of English language skills, including using context to define unfamiliar words, identifying appropriate support for ideas, using active voice, and applying rules for the conventions of standard written English.

Basic

Students in grade ten at the **basic** level demonstrate understanding of explicit aspects of grade-appropriate text. In informational text, they identify the stated purpose and use text features to understand the organization. They may identify the support an author provides for the main argument. In literary text, they identify the structural characteristics of dramatic forms, identify the speaker, and compare the motivations and reactions of characters. Students at this level demonstrate a limited command of English language skills, but they may use context clues to determine the meaning of common words, understand common word derivations, identify appropriate revisions to text, and identify common examples of correct written English.

Below Basic

Students in grade ten at the **below basic** level may demonstrate understanding of explicit aspects of grade-appropriate text, including text structure and purpose, speaker, character traits, and theme. In addition, students at this level can identify the literal and figurative meaning of common words, recognize the precise use of words, select an appropriate topic sentence, and identify examples of correct written English.

Specific Descriptors: Word Analysis and Vocabulary Development

Advanced students:

- Distinguish between the literal and figurative meanings of complex words and phrases in context.

Proficient students:

- Use context clues to define the meaning of unfamiliar words.
- Understand word derivations.

Basic students:

- May understand the difference between denotative and connotative meanings of words.
- Use context clues to determine the meaning of common words.
- Understand common word derivations.

Below basic students:

- Identify the literal and figurative meaning of words in context.

Specific Descriptors: Reading Comprehension

Advanced students:

- Evaluate how the author's intent affects the structure and tone of text.
- Evaluate text for structure and clarity.

Proficient students:

- Understand organization, features, and purpose of informational text.
- Identify the type of support for an author's argument.
- Analyze text for structure and development of topic.

Basic students:

- Demonstrate a limited understanding of organization, features, and purpose of informational text.
- May identify the support for an author's argument.
- Use text structure to locate information.

Below basic students:

- May understand the features and purpose of informational materials.
- May use text structure to locate information.

Specific Descriptors: Literary Response and Analysis

Advanced students:

- Analyze author's development of time and sequence.
- Analyze the intended effect of complex literary devices.
- Draw logical conclusions from information in the text.

Proficient students:

- Identify and analyze the structural characteristics and purposes of different forms of dramatic literature.
- Compare motivations and reactions of characters and their effect on plot.
- Compare works of literature with a universal theme.
- Interpret the effects of ambiguity, subtlety, contradiction, irony, and incongruity in text.

Basic students:

- Identify the structural characteristics of different forms of dramatic literature.
- Compare motivations and reactions of characters.
- Identify the speaker or narrator.

Below basic students:

- May identify the theme of a literary text.
- Identify character traits.
- May identify the speaker or narrator.

Specific Descriptors: Written Conventions

Advanced students:

- Identify and correctly punctuate complex sentences.
- Identify and correctly use parallel structure.

Proficient students:

- Identify and apply rules for correct written English.
- Identify and correctly use phrases and clauses.

Basic students:

- Identify common examples of correct written English.
- May identify and use phrases and clauses correctly.

Below basic students:

- May identify correct written English.

Specific Descriptors: Writing Strategies

Advanced students:

- Synthesize information to determine appropriate support for ideas.
- Understand the use of thesis and concluding statements.

Proficient students:

- Identify revisions that relate to the main ideas of the text.
- Use active voice.
- Identify appropriate diction.

Basic students:

- May identify revisions that relate to the main ideas of the text.
- Identify precise language.

Below basic students:

- May identify precise language.
- May choose an appropriate topic sentence.

History and Social Science

Descriptions for Grade 8 History Performance Levels

Summary-Level Descriptors

Advanced

Students in grade eight at the **advanced** level demonstrate an understanding of complex social studies concepts, including cultural and political connections between the past and the present, the impact of geography on human development, and the relationship between past cultures and modern cultures. Advanced students demonstrate thorough knowledge of historical information, including important events and ideas, and the ideas and political concepts used to justify the structures of past societies at various times. Advanced students show analytical skills through their ability to synthesize ideas and information, seeing the connections between events and ideas, and the impact of ideas and beliefs on historical events. They are able to analyze primary sources and show a mastery of period vocabulary.

Proficient

Students in grade eight at the **proficient** level demonstrate an ability to understand social studies concepts, including the influence of the past on the present, human responses to geography, and the relationship between past cultures and modern cultures. Proficient students demonstrate a knowledge of historical information including important events and ideas, as well as descriptive knowledge of the structures of past societies at various times. They recognize connections between the past and present, and the relationships between ideas and past events. Proficient students are able to read and understand primary sources and are able to understand period vocabulary.

Basic

Students in grade eight at the **basic** level are able to recognize the features of cultures in the past and are able to identify geographic relationships and cultural interactions. Basic students demonstrate the ability to recall major events from the past and recognize the effects of past events. They recall key figures from historical eras, and recognize historical comparisons. Basic students are able to recognize names of historic cultures and commonly used period vocabulary.

Below Basic

Students in grade eight at the **below basic** level may recognize features of cultures in the past. They may recall major events from the past. Below basic students may recognize key figures from the past. They may recall commonly used period vocabulary.

Specific Descriptors: Ancient Civilizations

Advanced students:

- Understand the significance of Judaism as the first monotheistic religion that was based on the concept of one God who set down moral laws for humanity.
- Understand the significance of geography to developing cities and early civilization.

Proficient students:

- Understand the importance of mythology in the past and its effects on today's literature.
- Recognize that weather and modification of the physical environment by early humans led to the domestication of plants and animals.
- Recognize the contributions of various early civilizations, including art, architecture, religion, and economic and social structures.

Basic students:

- Recall basic vocabulary relative to the evolution of language into written forms.
- Recognize the features of various early civilizations including art, architecture, religion, and economic and social structures.
- Recognize the vocabulary relative to ancient civilizations.

Below basic students:

- May recognize basic features of ancient art.
- May recognize key religious and political figures of ancient civilizations.

Specific Descriptors: Late Antiquity and the Middle Ages

Advanced students:

- Evaluate and connect the consequences of the religious Crusades on various cultures in Europe and the Eastern Mediterranean.
- Assess significant developments in medieval legal and constitutional practices.
- Recognize vocabulary relative to the period.
- Understand the impact of overland and maritime trade between western and non-western civilizations.

Proficient students:

- Understand the changing relationships between monarchs and the Papacy during medieval times.
- Recognize the development and role of feudalism in medieval society.
- Recognize the contributions of non-western technologies to Western Europe.

Basic students:

- Remember basic vocabulary relative to late antiquity and the Middle Ages in the history of Western and non-Western civilizations.
- Identify connections and effects of trade between Western and non-Western civilization.
- Recall the consequences of Western exploration on Meso-American and Andean civilization.

Below basic students:

- May recognize the interaction of Western and non-Western social, cultural, and technological ideas and the impact each had on the other.

Specific Descriptors: Renaissance/Reformation

Advanced students:

- Evaluate and connect the contribution of enlightenment thinkers to later political ideas.
- Analyze the impact of trade between the continents during the 16th, 17th and 18th centuries.
- Readily recognize vocabulary relative to the period.
- Evaluate and understand the development of Renaissance art and technology and its interaction with the changing culture.

Proficient students:

- Understand the contribution of English ideas about individual freedoms and the evolution of democracy.
- Understand the development of medieval and Renaissance art and technology and its interaction with the changing culture.

Basic students:

- Remember key figures and their contributions to the time period.
- Recall significant scientific advances of the period.

Below basic students:

- May recognize features and influences of the Renaissance and Reformation periods on today's societies.

Specific Descriptors: U. S. Constitution and the Early Republic

Advanced students:

- Analyze the impact of American foreign policy and statements on westward expansion.
- Assess the effects of moral and political ideas that influenced the political evolution of the United States.
- Evaluate how conflict between political ideas and policies of key figures from the period impacted American political systems.

Proficient students:

- Understand the importance and effect of speeches by key figures in early American history.
- Describe the impact on society from urbanization, industrialization, and increased immigration.
- Understand the political and economic motivations for westward expansion.
- Understand the consequences and ideas of Manifest Destiny on territorial acquisitions and decisions.

Basic students:

- Recognize the changes in society from the growth of industrialization and immigration.
- Remember the effects of westward expansion of the United States on bordering countries.
- Recall the common motivations and effects of westward migration.

Below basic students:

- May recognize basic vocabulary and events relative to the period.
- May identify the relationship between events of the period.

Specific Descriptors: Civil War and Its Aftermath

Advanced students:

- Analyze the struggles between the ideas of states' rights versus the abolition movement.
- Evaluate the multiple causes, key events, and consequences of the Civil War.
- Assess constitutional issues and ideas and consequences of the Civil War.

Proficient students:

- Understand the motivations and contributions of key figures and the general population from the period.
- Understand the character and consequences of Reconstruction.

Basic students:

- Recognize the advantages and disadvantages for both sides.
- Recognize key figures, vocabulary and events of the period.

Below basic students:

- May recall major figures of the period.

Descriptions for Grade 10 History Performance Levels

Summary-Level Descriptors

Advanced

Students in grade ten at the **advanced** level evaluate and analyze broader themes of historical continuity and change. They evaluate the motivations of major figures in history and analyze historical, political, and geographic consequences of decisions. Advanced students describe the significance of world leaders and analyze the causes and consequences of major past events. They evaluate the impact of major political ideas such as democracy and constitutional government, and relate these ideas to their ancient origins.

Proficient

Students in grade ten at the **proficient** level describe and understand historical relationships. They understand the effects of major events and transformations in history. Proficient students understand the significance of decisions made by world leaders and describe the causes and consequences of major past events. They understand the impact of major political ideas such as democracy and constitutional government, and they describe the evolution of these ideas in different contexts.

Basic

Students in grade ten at the **basic** level recognize the outcomes and consequences of historical change. They can recall the names and actions of major figures in history and can recognize major past events. They recognize the ideas and vocabulary of major political ideas such as democracy and they recognize these ideas in different contexts.

Below Basic

Students in grade ten at the **below basic** level rarely recognize the outcomes and consequences of historical change. They sometimes recognize the names of major figures in history and major past events. They sometimes recognize the ideas and vocabulary of major political ideas such as democracy and recall these ideas in different contexts.

Specific Descriptors: Development of Modern Political Thought

Advanced students:

- Analyze the similarities and differences in the world's major revolutions.
- Evaluate the effect of the philosophies of ancient civilization on the development of western political thought.
- Evaluate the contribution of the American Revolution and Constitution and their influence on global struggles for political change.

Proficient students:

- Understand the influence of the American Revolution and Constitution on global struggles for political change.
- Recognize principles and documents that served as the basis for development of the Constitution.
- Describe the evolution of government in France from monarchy through Napoleon.

Basic students:

- Know similarities and differences in the American Revolution and the French Revolution.
- Recognize the main components and vocabulary of the American Constitution.

Below basic students:

- May recognize contributions of major figures who influenced democratic thought.
- May recall basic similarities and differences in documents from the American and French revolutions.

Specific Descriptors: Industrial Expansion and Imperialism

Advanced students:

- Evaluate the changing nature of work and labor in the era of industrialization, including the effects of the declining slave trade as well as scientific and technological advances.

Proficient students:

- Describe and understand the struggles and key figures for independence in the colonized regions of the world.
- Understand the link between the industrial economies, colonialism, and imperialism.
- Understand the effects of the industrial revolution on the world.

Basic students:

- Recognize how the writings of the era reflected the consequences of the industrial revolution.
- Recognize outcomes and business decisions during the industrial revolution.
- Recognize the impact the factory system had on workers in the era.

Below basic students may:

- Recognize the causes and consequences of the industrial revolution.

Specific Descriptors: Causes and Effects of the First World War

Advanced students:

- Evaluate the motivations precipitating World War I.
- Evaluate how the end of World War I affected the world economy, geography, and political borders.
- Evaluate the political outcomes following World War I.

Proficient students:

- Understand how the course and outcome of the World War I affected political changes.
- Understand how alliances formed prior to the World War I influenced the decisions to go to war.
- Understand the political outcomes for leaders following World War I.
- Understand the significance of the United States' entry in World War I.

Basic students:

- Recognize the nature of World War I and its human costs.
- Identify the effects of geography on military strategy.
- Recall main leaders and their contributions in World War I.

Below basic students:

- May know the areas of battle and turning points of World War I.
- May recognize the alliances and their member-countries in World War I.

Specific Descriptors: Causes and Effects of the Second World War

Advanced students:

- Evaluate the political consequences of decisions made during World War II.
- Describe the significance of major world leaders and key figures of the World War II era.

Proficient students:

- Understand the outcomes and motivations of the leaders during the period of World War II.

Basic students:

- Identify countries involved in World War II and major events leading up to the war.

Below basic students:

- May recognize key vocabulary and events relative to the period of World War II.
- May recognize the effects of propaganda.

Specific Descriptors: International Developments in the Post World War II Era

Advanced students:

- Analyze the significant causes and consequences of the Cold War.
- Analyze the impact of the decisions of the Soviet Union on its Eastern European satellites.

Proficient students:

- Understand the consequences of the shifts in economic and military policies following World War II.
- Understand the impact of the political policies and attitudes regarding Communism and containment following World War II.
- Describe the significant events leading to the Cold War.

Basic students:

- Recognize how natural features influence urban growth in developing countries.
- Recall the work and purposes of post-war organizations and alliances.
- Identify the differences and conflicts caused by world religions.

Below basic students:

- May recall basic vocabulary relative to technology and world economy.

Descriptions for Grade 11 History Performance Levels

Summary-Level Descriptors

Advanced

Students in grade eleven at the **advanced** level demonstrate the ability to evaluate the effects of past domestic and foreign policy programs of the United States, and to analyze the intentions of key figures from the past. They assess policy changes and their impact. Advanced students analyze literary and artistic developments in response to economic and cultural change. Advanced students evaluate public attitudes and analyze resulting social changes. They analyze the motivations of key figures from the past and evaluate the effects of policy and ideological points of view.

Proficient

Students in grade eleven at the **proficient** level understand the effects of past domestic and foreign policy programs of the United States and describe the intents of key figures from the past. They describe policy changes and their impact. Proficient students describe literary and artistic developments in response to economic and cultural change. They describe public attitudes and understand resulting social changes. They understand the motivations of key figures from the past and describe their ideological points of view.

Basic

Students in grade eleven at the **basic** level recognize the effects of economic and political change, and recall key figures from the past. They recognize themes in literary and artistic developments. Basic students recall public attitudes and recognize their implications. They recall major issues from the past and recognize differing points of view.

Below Basic

Students in grade eleven at the **below basic** level may recognize patterns of economic and political change. They may recall major themes from the past. Below basic students may recall key figures and recognize major issues from the past.

Specific Descriptors: Foundations of American Political and Social Thought

Advanced students:
- Analyze the motivations of key figures in United States history.
- Evaluate the effects of United States foreign policy.
- Assess the effect of ideological compromises in the drafting of the Constitution.

Proficient students:
- Describe the impact of key figures in U.S. history.
- Understand how enlightenment ideas contributed to the rise of democracy.
- Describe key judicial decisions and events in the struggle between state and federal authority.

Basic students:
- Recall key figures in U.S. history.
- Recognize that enlightenment ideas contributed to the rise of democracy.

Below basic students:
- May recognize the impact of immigration on religions in the United States

Specific Descriptors: Industrialization and the U.S. Role as a World Power

Advanced students:
- Evaluate the political programs and activities of the Progressives and Populists.
- Evaluate the effects of presidential foreign policy on the role of the United States as a world power.

Proficient students:
- Describe the effects of industrialization on living and working conditions as illustrated in Upton Sinclair's work, *The Jungle*.
- Understand the change in U.S. foreign policy as the country became a leading world power.
- Understand the major effects of social and religious ideologies in the United States.

Basic students:
- Recognize how new technologies contributed to the rise of industrialization.
- Recall key terms, people and events that affected society during the period.

Below basic students:
- May recognize immigration patterns during the period.

Specific Descriptors: The United States Between World Wars

Advanced students:

- Evaluate the attempts by the federal government to minimize the effects of the Depression period and the controversies surrounding these policies.
- Analyze the response to attacks on civil liberties.

Proficient students:

- Understand the attempts by the federal government to minimize the effects of the Depression period.
- Understand the social and economic impact of Dust Bowl on California.
- Describe the works and intent of the Harlem Renaissance period.

Basic students:

- Recognize key people and their contributions during the period.
- Recognize the themes of the Harlem Renaissance artists, musicians, and writers.

Below basic students:

- May recognize key people or themes in the period between the world wars.

Specific Descriptors: World War II and Foreign Affairs

Advanced students:

- Evaluate the implication of U.S. policy prior to the World War II and the United States' reluctance to enter the war.
- Analyze how U.S. attitudes about Communism affected post-war foreign policy.

Proficient students:

- Understand the effects of U.S. policies at home on Japanese Americans.
- Describe the results of Franklin Delano Roosevelt's foreign policy and how his policy affected his decisions during the war.
- Understand how U.S. attitudes about Communism affected post-war foreign policy.

Basic students:

- Recall the contributions of women at home during World War II.
- Recognize contributions of minorities to the World War II effort.

Below basic students:

- May identify key events in the World War II era.

Specific Descriptors: Post-World War II Domestic Issues

Advanced students:

- Evaluate the intent of key figures affecting domestic policy issues.
- Analyze the increased powers of the presidency since the Depression Era.

Proficient students:

- Understand the impact technology had on changes in employment.
- Describe key events in the struggle for civil rights.

Basic students:

- Recall key events in the struggle for civil rights.
- Recognize the growth of issues related to environmental protection.

Below basic students:

- May recall key events in the civil rights era.

Mathematics

Descriptions for Grade 2 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade two at the **advanced** level have a full understanding of addition and subtraction and use these operations to compute multi-digit problems and solve word problems. Advanced students have a foundational understanding of concepts covered in more depth in third grade, including multiplication, place value, fractions, and variables. They understand the properties of rectangles, the basic principles of linear measurement, differences among angles, and combinations of plane figures. Advanced students demonstrate facility with data represented in charts, tallies, and simple graphs. They also can analyze data sets to determine such aspects as the range, the most frequent value, and the difference between the greatest and the least values.

Proficient

Students in grade two at the **proficient** level can add and subtract multi-digit numbers. They can identify the place value of digits in a whole number up to 1,000, compare whole numbers and use inequality symbols, and identify the value of combinations of bills and coins. Using models, they demonstrate understanding of a whole divided into fractional parts. Their understanding of the basic principles of algebra includes the ability to identify the numbers sentence needed to solve a one-step word problem. Proficient students know foundational principles of measurement and geometry: They understand properties of rectangles, identify polygons by the number of sides, measure length, convert hours to minutes, and identify right angles. They also can convert a tally chart to a picture graph and use data from a chart to solve problems.

Basic

Students in grade two at the **basic** level compute multi-digit addition problems and subtraction problems that do not require regrouping. They compare whole numbers. They use models to demonstrate understanding of fractions as parts of a whole. They understand the concept of number sentences. Students at this level possess a variety of measurement skills, including determining the area of a figure given the size of one square unit, choosing an appropriate tool to measure length, converting hours to minutes, and measuring an object by repeating a nonstandard unit. Students at the basic level have some understanding of the graphical representation of data and can convert a tally chart to a picture graph with a one-to-one correspondence.

Below Basic

Students in grade two at the **below basic** level know basic addition and subtraction facts and can usually compute two-digit problems that do not require regrouping. These students have an emerging sense of fractions and may be able to use models to identify how many fractional parts equal a whole and identify a unit fraction as part of a whole. They may select the correct symbol that will make a simple equation true or compare whole numbers. Their measurement skills include identifying some properties of rectangles, identifying the number of sides of a polygon, measuring length, and reading time to the quarter hour. Students at the below basic level also can interpret data from a picture graph and may identify different representations of the same data, using bar and tally charts.

Specific Descriptors: Number Sense

Advanced students:

- Compare unit fractions.
- Identify the correct operation to solve a word problem.
- Compute multi-digit subtraction with regrouping.
- Know how many fractional parts equal a whole without a model in the context of a word problem.

Proficient students:

- Solve multi-digit problems using addition and subtraction.
- Solve word problems using addition.
- Solve problems involving multiples of 5.
- Use models to understand the concepts of addition.
- Compare whole numbers and use inequality symbols.
- Identify the value of combinations of bills and coins.
- Use a model to demonstrate understanding of the concepts of breaking a whole into fractional parts and a fraction as part of a whole.

Basic students:

- Compute multi-digit addition and multi-digit subtraction without regrouping..
- Use a model to identify the fractional parts that equal a whole.
- Use a model to identify unit fractions as parts of a whole.
- Select the correct operational sign to make a simple number sentence true.
- Compare whole numbers.

Below basic students:

- Know simple addition and subtraction facts.
- Compute two-digit subtraction without regrouping.
- Use a model to identify how many fractional parts equal a whole.
- Select the correct operational sign to make a simple number sentence true.

Specific Descriptors: Algebra and Functions

Advanced students:

- Identify an equation needed to solve a word problem involving a variable.
- Identify equivalent expressions using the commutative and associative properties of addition when a problem is partially solved.

Proficient students:

- Identify the number sentence to solve a one-step word problem.

Basic students:

- Identify equivalent expressions using the commutative and associative properties of addition.

Below basic students:

- May recognize equivalent expressions with two addends using the commutative property of addition.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Recognize the inverse relationship between the size of a unit and the number of units needed to measure an object.
- Combine and subdivide plane figures.

Proficient students:

- Understand properties of rectangles.
- Identify polygons by the number of sides.
- Compute elapsed time.
- Convert hours to minutes and months into number of days.
- Measure length using standard and nonstandard units.
- Differentiate a right angle from other angles in a figure.

Basic students:

- Identify some properties of rectangles.
- Convert hours to minutes.
- Recall number of days in one month.
- Measure an object by repeating a nonstandard unit.
- Determine the area of a figure given the size of one square unit.
- Choose an appropriate tool to measure length.

Below basic students:

- Identify rectangles.
- Read time to the quarter hour on an analog clock.
- Identify the number of sides of a polygon.
- Measure length in centimeters and inches.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Identify the difference between the greatest and the least values in a data set.
- Identify values in an unordered data set.
- Calculate the range in a data set.
- Identify the most frequent value in a data set.

Proficient students:

- Convert a tally chart to a picture graph with one-to-many correspondence.
- Use data from a chart to solve problems.

Basic students:

- Convert a tally chart to a picture graph with a one-to-one correspondence.
- Solve problems using data from a picture graph.

Below basic students:

- May interpret data from a picture graph.
- Solve problems using data from a picture graph with one-to-one correspondence.
- Identify a tally chart that represents given data.

Descriptions for Grade 3 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade three at the **advanced** level have an excellent grasp of addition, subtraction, and multiplication of whole numbers and use these operations to solve multi-step word problems. They have a strong understanding of foundational concepts covered in more depth in grade four, including place value, decimals, fractions, comparison of whole numbers, and the relationship between addition and subtraction. Advanced students have learned fundamental concepts of algebra, including identifying the equation involving a variable to solve a word problem and determining the missing number that will make an inequality true. They understand perimeter, area, and volume as well as the properties of triangles. Students at this level also demonstrate an emerging understanding of basic concepts of probability.

Proficient

Students in grade three at the **proficient** level have a grasp of operational procedures including addition, subtraction, and multiplication of whole numbers and problems involving money. They can perform operations in the context of simple, one-step word problems. They have a strong understanding of whole number place value, can compare and order whole numbers, and can add simple fractions with common denominators. Proficient students demonstrate understanding of simple algebraic concepts, including finding the total cost, given unit cost and the number of items, and identifying the missing value to make an equation true. They understand perimeter and find area by counting unit squares. They have a solid grasp of basic principles of geometry, including the properties of quadrilaterals, classification of polygons, and right angles. Students are developing concepts of probability at this level and can identify and read a variety of data representations showing results from probability experiments.

Basic

Students in grade three at the **basic** level perform the operations of addition and subtraction with increasing facility and have an emerging grasp of multiplication. They can identify place value in a whole number less than 10,000 and compare and order three-digit numbers from greatest to least. The algebraic concepts demonstrated by students at this level include identifying the missing operation to make an equation true, using the commutative property of multiplication to identify a solution, and identifying the equation to solve a one-step word problem. These students also possess a variety of skills in measurement and geometry, including converting length using metric units, determining the area of a figure given the size of one square unit, and choosing an appropriate tool to measure length. Basic students also may identify different representations of the same data in a probability experiment.

Below Basic

Students in grade three at the **below basic** level perform multi-digit addition and subtraction problems and add simple fractions with common denominators. They identify an equivalent expression using the commutative property of multiplication and determine the next number in a linear pattern. Students at this level demonstrate a variety of skills in measurement and geometry, including choosing the appropriate tool to measure time, identifying common three-dimensional objects, calculating the perimeter of a polygon, and estimating relative weight of given objects. Students read tally charts and may possess foundational concepts of probability such as the ability to interpret a data display representing the results of a probability experiment.

Specific Descriptors: Number Sense

Advanced students:

- Understand the concepts of all four operations.
- Set up a division problem from a word problem.
- Solve multi-digit division problems with a one-digit divisor.
- Find unit cost given total cost and number of units.
- Identify various representations of tenths.
- Recognize, given a figure, the decimal equivalent for a fraction with a denominator of 10 or 100.

Proficient students:

- Solve multi-step word problems involving addition and subtraction.
- Solve multi-digit subtraction problems involving regrouping with zeros.
- Accurately subtract money in decimal formats.
- Understand the concept of multiplication and solve two-digit times one-digit multiplication problems.
- Set up a multiplication problem from a word problem.
- Set up a problem using data from a chart and choose the correct operation.

Basic students:

- Identify the place value of a digit in a whole number less than 10,000.
- Use subtraction to check the answer to an addition problem.
- Compare and order three-digit numbers from greatest to least.
- Identify the inverse equation for multiplication and division using a model.

Below basic students:

- May understand the property of one in multiplication.
- Identify expanded notation for a three-digit number.
- Add simple fractions with common denominators.

Specific Descriptors: Algebra and Functions

Advanced students:

- Identify the equation involving a variable to solve a word problem.
- Identify the missing number to make an inequality true.

Proficient students consistently:

- Find total cost given unit cost and the number of items.
- Identify the missing value to make an equation true.

Basic students:

- Use a functional relationship of two given numbers to solve a word problem.
- Identify the missing operation to make an equation true.
- Use the commutative property of multiplication to identify a solution.
- May identify the equation to solve a one-step word problem.

Below basic students:

- Identify the next number in a linear pattern.
- Identify an equivalent expression using the commutative property of multiplication.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Convert minutes to hours in a word problem.
- Understand properties of triangles.
- Calculate the perimeter of a rectangle given the length and width.
- Understand the concept of volume.
- Visualize a rectangular prism from a two-dimensional view.
- Determine the volume of a rectangular prism by counting cubic units.

Proficient students:

- Choose the appropriate tool to measure length and weight.
- Understand properties of a rectangle.
- Find perimeter, given side lengths.
- Find area by counting unit squares.
- Differentiate a right angle from other angles in a figure.
- Identify and classify polygons.
- Identify right angles.

Basic students:

- Choose the appropriate tool to measure length.
- Convert length using metric units.
- Determine the area of a figure, given the size of one square unit.

Below basic students:

- Choose the appropriate tool to measure time.
- Understand standard units of weight.
- Estimate the relative weight of given objects.
- Identify the rectangular prisms needed to create a more complex solid object.
- Identify common three-dimensional objects.
- Calculate the perimeter of a polygon, given length of all sides.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Identify a chart that summarizes the results of a probability experiment indicating the correct total number of trials.
- Identify and read a wide variety of data representations showing results from probability experiments.

Proficient students:

- Identify whether an event is certain, likely, unlikely, or impossible.
- Identify and read a variety of data representations showing results from probability experiments.

Basic students:

- Identify different representations of the same data from a complex-event probability experiment.

Below basic students:

- Read a tally chart.
- Identify a data display representing the results of a probability experiment.
- Identify different representations of the same data from a simple-event probability experiment.

Descriptions for Grade 4 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade four at the **advanced** level understand operational procedures with whole numbers, simple fractions, and decimals, and they apply their understanding in the context of multi-step word problems. They demonstrate a full understanding of factors and place value. They know and use foundational algebraic concepts such as variables, and they solve equations using multiple steps. They understand how to use algebraic formulas. They also demonstrate a strong knowledge of two- and three-dimensional shapes and their attributes. Advanced students correctly interpret models and displays to determine outcomes and combinations.

Proficient

Students in grade four at the **proficient** level have a strong grasp of operational procedures with whole numbers. Students know equivalent notations for decimals and fractions. They can perform operations in the context of word problems. They solve simple algebraic equations and can set up a correct equation from a written description. They determine measurements such as area and perimeter and understand the units required for each. They identify basic attributes of lines and two-dimensional figures and understand the concept of congruence. Proficient students interpret two-variable data from a variety of displays to solve multi-step problems, and they identify possible outcomes of simple combinations.

Basic

Students in grade four at the **basic** level demonstrate some understanding of fractions and decimals, including ordering and comparing mixed numbers, unit fractions, and decimals. They know some of the foundational principles for solving algebraic equations. They understand attributes of quadrilaterals, recognize parallel and perpendicular lines, and find area by counting grid squares. They understand and can identify acute, obtuse, and right angles. Students who are at the basic level can also identify different representations of the same data and may identify the most likely outcome in a probability experiment.

Below Basic

Students in grade four at the **below basic** level compute multi-digit addition problems with regrouping, identify the fractional part of a figure, and identify the missing factor given the other factor. In a familiar context, they may identify that equal amounts added to equal amounts remain equal. Students at this level understand foundational geometric concepts, including visualizing how a two-dimensional pattern can create a pyramid and identifying congruency. Also, they may identify different representations of the same data and identify the outcome that occurs most often in a data set.

Specific Descriptors: Number Sense

Advanced students:

- Compare fractions with different denominators.
- Interpret the scale of a given number line.
- Understand the place value of decimals and whole numbers and round decimals to the nearest whole number.

Proficient students:

- Understand the concepts of multiplication and division.
- Perform the operations of multiplication and division with multi-digit whole numbers.
- Understand the concept of factors.
- Factor small whole numbers.

Basic students:

- Recognize multiple factors of small whole numbers.
- Compare unit fractions and mixed numbers.
- Recognize mixed numbers on a number line.
- Recognize that the inverse expression for a division problem can be used to check solutions.

Below Basic students:

- Compute multi-digit addition problems with regrouping.
- Identify the fractional part of a figure.
- May recognize the position of a decimal (to tenths) on a number line.
- Identify the missing factor given the other factor.

Specific Descriptors: Algebra and Functions

Advanced students:

- Identify an expression involving parentheses to solve a word problem.
- Identify the order of operations to evaluate an expression involving parentheses.
- Use a given area formula to compute area.
- Identify the equation to find the area of a given rectangle.

Proficient students:

- Know the meaning of an equal sign.
- Understand that equal values added to equal values remain equal.
- Understand that equal values multiplied by equal values remain equal.
- Find the value of a variable in a simple equation.
- Substitute a value for a variable in an equation or expression.
- Set up an equation involving two variables from a written description.

Basic level:

- Evaluate simple expressions that include parentheses.
- Identify the missing number or operational sign to make an equation equal.

Below basic level:

- In a familiar context, may identify that equal amounts added to equal amounts remain equal.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Understand area and perimeter.
- Compare area and perimeter of rectangular shapes.
- Understand attributes of different triangles.
- Identify the location of a point on a coordinate plane given its coordinates.
- Calculate the length of a vertical line from its coordinates.

Proficient students:

- Compute the length of a horizontal line with a model, with or without grid lines.
- Understand the x and y coordinate system.
- Understand and identify different types and names of angles.
- Identify the radius and diameter of a circle.

Basic students:

- Understand most of the attributes of quadrilaterals.
- Identify parallel and perpendicular lines.
- Count grid squares to find the area given gridded models of a rectangle.
- Compare the area of different figures.

Below basic students:

- May identify congruency.
- Visualize how a two-dimensional pattern can create a pyramid.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Interpret models and displays that show possible events and outcomes.
- Identify the total number of combinations given a diagram.

Proficient students:

- Interpret two-variable data from a variety of displays to solve multi-step problems.
- Identify possible outcomes of simple combinations.

Basic students:

- Interpret two-variable data from a display to solve problems.
- Identify the most likely outcome in a probability experiment.
- Identify different representations of the same data.
- Identify the outcome that occurs most often in a data set.

Below basic students:

- May identify different representations of the same data.
- May identify the outcome that occurs most often in a data set.

Descriptions for Grade 5 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade five at the **advanced** level possess the ability to perform competently operations with whole numbers, fractions, and decimals. They understand key concepts that include finding equivalent fractions and decimals, factoring, rounding, and representing numbers on the number line. Students at this level also have mastered foundational principles of algebra: They can evaluate an expression with one variable, write an expression from a verbal description and write an equation from a function table. Their skills in measurement and geometry include the ability to use the sum of interior angles of polygons and compute perimeter, area, and volume. Advanced students also have a good understanding of statistical graphs.

Proficient

Students in grade five at the **proficient** level have developed a solid number sense as appropriate for grade five. They perform long division with multi-digit divisors, represent numbers on a number line, identify common fraction equivalents for decimals, add and subtract mixed numbers with unlike denominators of 20 or less, and identify the prime factors of numbers through 50. Proficient students also understand important algebraic concepts such as evaluating simple expressions and interpreting line graphs. Their skills in measurement and geometry include computing the perimeter and area of regular polygons, computing the volume of rectangular solids, and identifying angles and lines. Students at this level also can interpret the meaning of points plotted on a simple graph and identify the median of a data set

Basic

Students in grade five at the **basic** level perform operations with whole numbers and identify whole numbers on a number line with positive and negative values. They identify the fraction equivalents for simple decimals and add and subtract mixed numbers with unlike denominators of 20 or less when one denominator is a divisor of the other. They can evaluate simple algebraic expressions with one variable, write a simple expression from a verbal description, and interpret line graphs. They also can identify parallel and perpendicular lines.

Below Basic

Students in grade five at the **below basic** level have a limited facility with the four operations with whole numbers, but they identify numbers on a number line with positive values, may identify the fractional equivalent for a decimal, and may add and subtract mixed numbers with unlike denominators of 20 or less when one denominator is a divisor of the other. Students at this level may evaluate simple algebraic expressions with one variable when expressed arithmetically. They may compute the perimeter of a regular polygon, identify parallel lines, and identify a point on a graph.

Specific Descriptors: Number Sense

Advanced students:

- Perform long division with multi-digit divisors or decimal divisors or dividends.
- Understand positive integer powers as repeated multiplication.
- Choose the correct operation in a word problem.
- Find the fraction equivalent for a decimal.
- Add and subtract mixed numbers with unlike denominators.
- Interpret percentages as part of 100.
- Identify and represent numbers on a number line.
- Determine the prime factors of numbers through 50.
- Round very large numbers to specific place value.

Proficient students:

- Perform long division with multi-digit divisors.
- Identify and represent numbers on a number line.
- Identify common fraction equivalents for decimals.
- Understand positive integer powers as repeated multiplication.
- Add and subtract mixed numbers with unlike denominators of 20 or less.
- Identify the prime factors of numbers through 50.

Basic students:

- Identify numbers on a number line with positive and negative values.
- Identify the fraction equivalents for simple decimals.
- Add and subtract mixed numbers with unlike denominators of 20 or less when one denominator is a divisor of the other.

Below basic students:

- Identify numbers on a number line with positive values.
- May identify the fractional equivalent for a decimal.
- May add and subtract mixed numbers with unlike denominators of 20 or less when one denominator is a divisor of the other.

Specific Descriptors: Algebra and Functions

Advanced students:

- Evaluate algebraic expressions with one variable.
- Evaluate algebraic expressions using substitution, resulting in a negative solution.
- Write an expression from a verbal description.
- Write a verbal description from an equation.
- Write an equation from a function table.
- Use information from a line graph.
- Create a table from a linear equation.

Proficient students:

- Evaluate simple algebraic expressions with one variable.
- Write a simple expression from a verbal description.
- Interpret line graphs.
- Identify a table derived from a linear equation.

Basic students:

- Evaluate simple algebraic expressions with one variable when expressed arithmetically rather than algebraically.
- May write an expression from a verbal description.
- Identify ordered pairs on the coordinate plane.
- Interpret simple line graphs.

Below basic students:

- May valuate simple algebraic expressions with one variable when expressed arithmetically.
- Identify ordered pairs on the coordinate plane.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Compute perimeter, area, and volume of two-dimensional figures.
- Use the sum of interior angles for a triangle and a quadrilateral to solve problems with angle measurements given.
- Use the sum of interior angles for a triangle and a quadrilateral to solve word problems.
- Use a protractor to find an angle.
- Approximate the measure of an angle without a protractor.

Proficient students:

- Compute the perimeter and area of regular polygons.
- Compute the volume of a rectangular solid given all dimensions.
- Identify angles as well as perpendicular and parallel lines.
- Find the area of a parallelogram given the concept that two of the same triangles make a parallelogram.

Basic students:

- Identify parallel and perpendicular lines.
- Compute the perimeter of a regular polygon.

Below basic students:

- Identify parallel lines.
- May compute the perimeter of a regular polygon.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Interpret the meaning of a complex graph such as a double bar graph or scatter plot.
- Understand the relationship between graphs and tables.
- Understand the concept of median.

Proficient students:

- Identify ordered pairs.
- Interpret the meaning of points plotted on a simple graph.
- Interpret circle graphs.
- Identify the median of a data set.

Basic students:

- Identify ordered pairs.
- Interpret the meaning of points plotted on a simple graph.
- Create a circle graph given a table.
- May identify the median of a data set.

Below basic students:

- Identify a point on a graph.
- May create a circle graph given a table.

Descriptions for Grade 6 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade six at the **advanced** level understand integers and solve word problems that use integers. They solve problems involving ratios, proportions, rate, and order of operations. They understand the underlying principles of algebra and its relationship to geometry. They solve simple linear equations, find the missing angle in situations involving multiple angles, know area and volume formulas, and understand types of triangles. Advanced students solve simple probability problems and understand the ways that probability may be represented. They understand measures of central tendency and can determine how mean and median are affected by changes in the data set.

Proficient

Students in grade six at the **proficient** level have a good understanding of the concepts that underlie grade six mathematics, including integers, percentages, and proportions. They solve problems involving the addition of negative and positive integers, compare and order integers using visual representation, calculate percentages, and set up proportions from concrete situations. Their skills in algebra and geometry include solving one-step equations, writing expressions from word problems, solving problems involving rate, solving for the missing angle in a triangle or a supplementary angle, and identifying types of triangles. Proficient students also understand the basic concepts of probability and measures of central tendency.

Basic

Students in grade six at the **basic** level have mastered some of the basic concepts that underlie the mathematics they will encounter in grade seven. Students at this level compare and order integers with explicit visual representation and can represent integers on a number line. They find the greatest common divisor, solve proportions with 1 in either the numerator or denominator, write simple expressions from word problems, and solve one-step equations using addition or subtraction. They have a limited understanding of triangles but may identify types of triangles and solve for the missing angle. Their skills in data analysis include representing probabilities, creating an organized list, and determining how to conduct a representative survey.

Below Basic

Students in grade six at the **below basic** level may solve proportions in which 1 appears in the numerator or denominator, solve a one-step equation involving addition or subtraction, evaluate a one-step equation using substitution, calculate the volume of a triangular prism, identify common types of triangles, represent probability as a ratio, percent, or decimal, and understand the concepts of mean and median.

Specific Descriptors: Number Sense

Advanced students:

- Solve problems in which a negative integer is subtracted.
- Compare and order positive and negative numbers without visual representation.
- Use and interpret ratios in different contexts.

Proficient students:

- Set up proportions from a concrete situation.
- Calculate percentages of a quantity.
- Solve problems involving adding negative and positive integers.
- Compare and order positive and negative numbers using visual representation.
- Find the greatest common divisor in a problem situation and reduce to lowest terms.

Basic students:

- Solve proportions in which 1 appears in the numerator or denominator.
- May calculate percentages of a quantity.
- Understand some representations of numbers, including a number line.
- Compare and order positive and negative numbers with explicit visual representation.
- Find the greatest common divisor.

Below basic students:

- May solve proportions in which 1 appears in the numerator or denominator.

Specific Descriptors: Algebra and Functions

Advanced students:

- Solve a one-step equation involving addition, subtraction, multiplication, and/or division.
- Write an expression from a word problem.
- Write an expression for a geometric relationship.
- Express a geometric relationship as an equation.
- Solve problems involving rate.
- Solve order of operations problems.

Proficient students:

- Solve a one-step equation involving addition, subtraction, multiplication, or division.
- Evaluate a one-step equation using substitution.
- Write a simple expression from a word problem.
- Solve simple problems involving rate.

Basic students:

- Solve a one-step equation involving addition or subtraction.
- Evaluate a simple one-step equation using substitution.
- May write a simple expression from a word problem.

Below basic students:

- May solve a one-step equation involving addition or subtraction.
- Evaluate a one-step equation using substitution.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Solve for the missing angle in a complex angle situation (multiple angles).
- Know the formula for the area of a circle.
- Estimate the circumference of a circle from a word problem.
- Understand types of triangles.
- Express ideas (steps) using proper mathematical notation.

Proficient students:

- Solve for the missing angle in a triangle or a supplementary angle.
- Estimate the area of a circle with a picture.
- Identify types of triangles.
- Convert from feet to inches and know the conversion factor.

Basic students:

- Solve for the missing angle in a triangle.
- Calculate the volume of a triangular prism.
- May identify types of triangles.

Below basic students:

- May calculate the volume of a triangular prism.
- May identify common types of triangles.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Solve complex problems and represent probability as a ratio, percent, or decimal.
- Determine the theoretical probability from a word problem.
- Compare probabilities.
- Understand and calculate how additional data affect the mean or median.
- Evaluate valid claims from a data set.

Proficient students:

- Solve problems and represent probability as a ratio, percent, or decimal.
- Determine how to conduct a representative survey.
- Determine the probability of two disjoint events.
- Understand how additional data affect the mean or median.
- Determine valid claims from a data set.

Basic level:

- Represent probability as a ratio, percent, or decimal.
- Create an organized list.
- Understand how to conduct a representative survey.

Below basic students:

- May represent probability as a ratio, percent, or decimal.
- May understand the concepts of mean and median.

Descriptions for Grade 7 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade seven at the **advanced** level have a strong understanding of rational numbers, including scientific notation, exponents, and percents. These students have a strong understanding of the basic elements of pre-algebra, including algebraic expressions and variables. They are fully capable in solving problems in a wide variety of contexts. They have a strong understanding of geometric concepts, including the Pythagorean theorem. The advanced student is able to read and interpret data representations.

Proficient

Students in grade seven at the **proficient** level have a solid understanding of rational numbers, including operations, percents, and absolute value. These students have an understanding of the introductory concepts of functions. They are able to use formulas to solve problems in geometry and are able to solve problems using a variety of measurement systems. Proficient students understand common terms and concepts involving measures of central tendency of data sets, including median, minimum, maximum, and scatter plots.

Basic

Students in grade seven at the **basic** level have a limited understanding of rational numbers, but can convert from one form to another. These students have some understanding of how to apply number sense skills to real-world problems. They have a beginning understanding of graphs and their features. Also, they have some understanding of geometric properties, including the volume of a rectangular prism. Basic students have some understanding of statistics and data analysis, including the median of a data set.

Below Basic

Students in grade seven at the **below basic** level have a minimal understanding of rational numbers. These students understand the basic foundations of exponents. In addition, they have a limited understanding of how to translate between verbal and algebraic expressions. Below basic students have a minimal understanding of some aspects of geometry, such as the concept of congruence. In addition, these students understand only the most basic concepts of statistics, such as the median.

Specific Descriptors: Number Sense

Advanced students:
- Express ideas (steps) using proper mathematical notation.
- Compare rational numbers using scientific notation.
- Have extensive knowledge of number representation.
- Use exponent rules to simplify rational numbers.

Proficient students:
- Pull information out of word problems.
- Convert proper and improper fractions to decimals (and vice versa).
- Extract the root of perfect squares.
- Calculate percent increase or decrease.

Basic students:
- Convert proper fractions to decimals.
- Calculate discount and markup.
- Multiply and divide rational numbers.

Below basic students:
- Perform operations with rational numbers.
- Take positive rational numbers to whole number powers.

Specific Descriptors: Algebra and Functions

Advanced students:
- Evaluate expressions with two variables using substitution.
- Understand and solve multi-step rate problems.
- Understand all properties of rational numbers.
- Divide monomials

Proficient students:
- Solve a two-step equation when given the equation.
- Apply the identity and distributive properties.
- Infrequently divide monomials.

Basic students:
- Interpret information given on a line-graph.
- Identify the identity and distributive properties.

Below basic students:
- Interpret positive powers as repeated multiplication.
- Write an expression from a verbal description.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Interpret scale drawings and calculate actual distance.
- Solve Pythagorean theorem problems.
- Use dimensional analysis to find mass given the density and dimensions of the object.
- Compare rates.

Proficient students:

- Convert inches to multiple units.
- Create a two-dimensional figure on a coordinate plane.
- Calculate the area of a trapezoid given the formula.

Basic students:

- Convert metric lengths.
- Calculate the volume of a rectangular prism.

Below basic students:

- Identify congruent shapes.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Compare two sets of data from a box-and-whiskers plot.
- Describe the relationship between two variables from a scatter plot.

Proficient students:

- Identify the median on a box-and-whisker plot with a small or large range of data.
- Identify whether or not a relationship exists between two variables on a scatter plot.

Basic students:

- Identify the median from a table or a data set.

Below basic students:

- Identify the median from an ordered data set.

Descriptions for Grade 10 Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students in grade ten at the **advanced** level have a strong understanding of the properties of real numbers. These students are able to manipulate expressions involving exponents. They have a solid understanding of the fundamental concepts of Algebra, including solving and graphing linear equations. These students are able to solve multi-step problems involving rate and mixture. The advanced student has a strong understanding of the basic concepts of geometry, including the Pythagorean theorem, and uses these concepts in solving problems. They are able to determine the area of figures, with and without a coordinate grid. These students have a solid understanding of data analysis, including how best to represent data in a given situation.

Proficient

Students in grade ten at the **proficient** level are able to manipulate rational numbers and fractions to solve real-world problems and are adept at using scientific notation. Proficient students are able to use their knowledge of algebra to simplify complex expressions including performing operations with polynomials. These students can enumerate possible outcomes to estimate probabilities and understand measures of central tendency, including mean, median, and mode of data sets.

Basic

Students in grade ten at the **basic** level can perform simple numeric operations such as converting percentage increases and adding fractions. These students have some understanding of logical reasoning, including the ability to determine irrelevant information in a problem. They have some understanding of the graphs of linear functions and can interpret specific parts of the graph and use this information to solve problems. The basic student has some understanding of measurement principles, including unit conversion. These students have a limited understanding of data analysis and probability, including interpreting a graph and identifying possible outcomes of a dependent event.

Below Basic

Students in grade ten at the **below basic** level understand elementary properties of numbers, such as absolute values, and can perform basic arithmetic operations to solve problems. They can interpret a simple graph and solve one-step linear equations. These students have a minimal understanding of essential geometric concepts such as perimeters and have some understanding of graphical representations of data, including scatter plots.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Understand how changes in dimensions affect volumes and surface areas.
- Use the Pythagorean theorem to solve problems.
- Are able to find the area of simple figures.
- Use coordinate graphs to find areas and lengths of simple and complex figures.

Proficient students:

- Recognize the Pythagorean theorem.
- Find the volume of basic three-dimensional figures.
- Solve rate problems using ratios.

Basic students:

- Identify corresponding parts of congruent figures.
- Compare and convert weights, capacities, geometric measures, times, and temperatures between measurement systems.

Below basic students:

- Identify corresponding parts of congruent figures.
- Find perimeters of basic figures.

Specific Descriptors: Number Sense

Advanced students:

- Understand negative whole number exponents and solve problems involving negative exponents with the same base.
- Can convert between decimals and scientific notation.
- Solve problems involving percent discounts, markups, commissions, and profit.

Proficient students:

- Convert numbers from scientific notation to decimal notation.
- Solve problems involving operations with fractions.

Basic students:

- Calculate percentage of increase and decrease of a quantity.
- Solve problems by converting fractions to decimals and percents.
- Add and subtract fractions with different denominators.
- Distinguish relevant from irrelevant information and identify missing information to solve word problems.

Below basic students:

- Recognize positive whole number powers as repeated multiplication.
- Take the square root of a perfect square.
- Know the meaning of absolute value.
- Solve simple word problems by adding, subtracting, multiplying or dividing.

Specific Descriptors: Algebra and Functions

Advanced students:
- Solve problems by interpreting graphs of linear functions.
- Recognize graphs of quadratic and linear functions.
- Solve problems by using linear equations.

Proficient students:
- Solve multi-step rate problems using linear equations.
- Use properties of numbers to justify statements.
- Evaluate expressions involving integer powers.
- Identify positive whole number powers as repeated multiplication.

Basic students:
- Recognize specific parts of a graph of a linear equation.
- Solve simple problems by interpreting graphs of linear functions.
- Solve word problems involving rate, distance, and time using linear equations.
- Evaluate expressions using exponents.

Below basic students:
- Interpret simple graphs.

Specific Descriptors: Algebra I

Advanced students:
- Simplify and solve complex linear equations.
- Recognize the relationship of the slopes of parallel and perpendicular lines.
- Recognize reciprocals.
- Solve rate, work, and percent mixture problems using algebraic techniques.

Proficient students:
- Simplify complex expressions before solving equations.
- Recognize the graph of a system of linear equations.
- Perform operations with polynomials.
- Use linear equations to solve problems.
- Verify that a point lies on a line from a given equation.

Basic students:
- Simplify and solve linear equations in one variable.
- Simplify inequalities in one variable.
- Identify the graph of a linear equation.

Below basic students:
- Solve one-step linear equations.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Identify best representation for a given set of data.
- Find probability of independent and dependent events.

Proficient students:

- Find all possible outcomes of a situation to determine the probability of a particular outcome.
- Find the mean, median, and mode of a data set.

Basic students:

- Interpret a graph to evaluate information.
- Identify the possible outcomes for compound events.
- Interpret and compare graphically two sets of data to solve problems.

Below basic students:

- Use simple graphical representations to estimate or determine unknown quantities.
- Describe distribution or relationship between points on a scatter plot.
- Identify best representation for a given set of data.

Descriptions for General Mathematics Performance Levels

Summary-Level Descriptors

Advanced

Students at the **advanced** level have a strong understanding of number sense, including operations involving whole numbers, decimals, and fractions. These students have a solid understanding of the concepts of pre-algebra, including the concept of a variable. They have a solid understanding of the basic elements of geometry, including the Pythagorean theorem. The advanced student has a strong understanding of data representation, including interpretation of a scatter plot. In addition, these students have a solid understanding of probability, such as finding the probability of an independent event.

Proficient

Students at the **proficient** level have a solid understanding of whole number operations, including exponents and square roots. These students are able to perform some operations with decimals and fractions, including converting fractions to decimals. They have some understanding of equations, including graphs of linear functions and solving real-world problems such as those involving rate and distance. The proficient student understands the general concepts of geometry, including scale drawing and coordinate geometry. These students have a solid understanding of the measures of central tendency, such as computing the median.

Basic

Students at the **basic** level have a limited understanding of number sense. They are able to perform simple operations with fractions. These students have some understanding of solving equations and algebraic expressions. They have limited understanding of key geometry concepts, such as volume. The basic student has some understanding of statistics, such as the median of an ordered data set.

Below Basic

Students at the **below basic** level have a minimal understanding of the basic operations involving fractions and decimals. These students have a limited understanding of problem solving, including real-world applications involving decimal amounts of money. They have a minimal understanding of pre-algebra concepts, such as variables. The below basic student has minimal understanding of geometry. These students have some understanding of the concepts of probability, including the probability of an event occurring or not occurring.

Specific Descriptors: Number Sense

Advanced students:

- Express whole numbers in scientific notation.
- Convert between fractions and decimals.
- Reduce fractions to simplest form.
- Add and subtract mixed numbers with unlike denominators.
- Multiply, divide, and simplify rational numbers by using exponent rules.

Proficient students:

- Convert improper fractions to decimals.
- Add fractions with unlike denominators.
- Take positive rational numbers to a whole number power.
- Extract the root of a perfect square integer.

Basic students:

- Convert commonly known fractions to decimals.
- Add commonly known fractions.

Below basic students:

- Divide decimals expressed as money by whole numbers.

Specific Descriptors: Algebra and Functions

Advanced students:

- Use symbolic representation involving grouping symbols to express quantitative relationships.
- Understand, identify, and calculate slope based on a linear graph.
- Graph a linear equation given a data table.

Proficient students:

- Use symbolic representation to express quantitative relationships.
- Solve two-step linear equations with one variable with rational numbers.
- Solve multi-step problems involving rate and distance.
- Interpret graphs of linear functions.

Basic students:

- Solve two-step linear equations with one variable involving whole numbers.
- Evaluate algebraic expressions involving whole numbers.
- Solve multi-step rate problems involving addition and multiplication of whole numbers.
- Simplify basic algebraic expressions using the distributive property.

Below basic students:

- Use symbolic representation to express quantitative relationships with whole numbers and addition.

Specific Descriptors: Measurement and Geometry

Advanced students:

- Apply the Pythagorean theorem to find the length of a missing side of a right triangle.
- Determine a reflected image on a coordinate plane.
- Solve a problem using measures expressed as products (person-hours).
- Use ratios to convert between units of measure.

Proficient students:

- Use ratio to interpret a scale drawing.
- Convert inches to feet.
- Understand and use coordinate graphs of parallelograms to determine lengths and areas.
- Calculate volume of a rectangular solid based on a diagram.

Basic students:

- May be able to convert inches to feet.

Below basic students:

- May be able to calculate the volume of a rectangular solid.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Interpret correlation based on scatter plot
- Express all possible outcomes of a compound event
- Understand the probability of independent events
- Evaluate the validity of claims of simple cases based on statistical data, including the concept of sampling

Proficient students:

- Understand and compute the median of a data set

Basic students:

- May be able to compute the median

Below basic:

- Identify the median based on a box-and-whisker plot
- Understand that the probability of an event not occurring is 1 – P

Descriptions for Algebra I Performance Levels

Summary-Level Descriptors

Advanced

Algebra I students at the **advanced** level have a strong understanding of number properties and logical reasoning. They understand equations, including absolute value equations, roots, and systems of linear equations. They are able to manipulate rational expressions. In addition, they fully understand the concept of functions. These students are adept at all aspects of graphing, including linear equations and inequalities. They have a strong understanding of polynomials, including factoring. Also, these students have an understanding of quadratic equations, including graphing and solving.

Proficient

Algebra I students at the **proficient** level have a solid understanding of rational numbers and their properties. They understand algebraic expressions. These students have a solid understanding of polynomials, including simplifying and factoring. Proficient students understand graphing, including intercepts and point-slope equations. These students are adept at solving problems involving context.

Basic

Algebra I students at the **basic** level have a limited understanding of the basic concepts of Algebra I. They have some understanding of algebraic expressions, including monomials. These students understand basic properties of real numbers, such as exponents and the distributive property. The basic student has a limited understanding of graphs of functions (linear and quadratic). These students can solve some problems, including one-step equations and word problems.

Below Basic

Algebra I students at the **below basic** level have a minimal understanding of the concept of variable and other foundational topics of Algebra I. These students have difficulty manipulating algebraic expressions. They have little understanding of functions and their graphs. They have some understanding of number properties.

Specific Descriptors: Number Properties, Operations, and Linear Equations

Advanced students:
- Understand and identify counterexamples.
- Solve absolute value equations.
- Simplify radical expressions including roots of perfect squares and perfect cubes.

Proficient students:
- Simplify algebraic expressions, including combining like terms on the same side of the equation.
- Understand and use operations such as taking the opposite.
- Determine when statements are true or false using properties of numbers.
- Solve multi-step problems including linear inequalities with one variable of rational numbers.

Basic students:
- Understand and use the rules of exponents.
- Solve linear equations with one variable, including word problems.
- Simplify algebraic expressions involving the distributive property.
- Judge the validity of statements based on properties of numbers.

Below basic students:
- Understand the definition of reciprocal.
- Recognize errors in the steps for the solution of a multi-step equation.

Specific Descriptors: Functions and Rational Expressions

Advanced students:
- Simplify problems with rational polynomials.
- Understand the properties of functions.
- Multiply, factor, and reduce rational polynomials.
- Determine the domain and range defined by a graph.
- Understand the difference between relations and functions.

Proficient students:
- May simplify problems involving polynomials.
- May factor polynomial expressions.

Basic students:
- Recognize the range when asked for y-values of a graph.
- Understand the characteristics of the quadrants in a coordinate plane.

Below basic students:
- May recognize the quadrants in a coordinate plane.

Specific Descriptors: Graphing and Systems of Linear Equations

Advanced students:

- Understand the relations of the graphs of linear equations, including x- and y-intercept, and lines that are parallel and perpendicular to them.
- Verify a point lies on a line when presented with rational numbers.
- Identify a region defined by a linear inequality or system of inequalities.

Proficient students:

- Solve systems of equations algebraically.
- Derive linear equations given slope and a point.
- Recognize the relations of the graphs of linear equations, including x- and y-intercept, and lines that are parallel and perpendicular to them.

Basic students:

- May solve some systems of equations.

Below basic students:

- May recognize parallel and perpendicular lines.

Descriptions for Geometry Performance Levels

Summary-Level Descriptors

Advanced

Geometry students at the **advanced** level have a strong understanding of logic and reasoning. These students are able to apply these skills to geometric proofs, including congruent triangles. They fully understand the concepts of perimeter and volume and properties of geometric figures. The advanced student has a strong understanding of angle relationships and geometric constructions. These students have a strong understanding of trigonometry and the identities of trigonometric functions.

Proficient

Geometry students at the **proficient** level have a solid understanding of the structure of a proof. These students are able to solve problems involving common two- and three-dimensional figures. They have a solid understanding of properties of right triangles, including the Pythagorean theorem. Proficient students understand basic geometric constructions and can solve basic problems involving trigonometry.

Basic

Geometry students at the **basic** level have a limited understanding of geometric proofs. These students have some understanding of the properties of geometric shapes, including parallelograms. They have a limited understanding of area, perimeter, and volume. The basic student is able to solve simple problems involving simple figures. These students have some understanding of angle relationships, including angles created by parallel lines and a transversal. They have a limited understanding of the properties of quadrilaterals and circles.

Below Basic

Geometry students at the **below basic** level have a minimal understanding of the fundamental concepts of geometry. These students have a minimal understanding of the properties of basic two- and three-dimensional figures. They have a limited understanding of relationships between sides and angles, including the Pythagorean theorem. The below basic student has little to no understanding of trigonometric functions. These students have minimal understanding of geometric constructions.

Specific Descriptors: Volume and Area Formulas

Advanced students:

- Synthesize multiple geometric properties into a single problem involving perimeter, area, and volume.
- Solve algebraic problems involving perimeter, area, and volume.

Proficient students:

- Calculate the area of quadrilaterals, given the figure on a coordinate plane.
- Calculate surface area of cones, cylinders, and spheres, given a formula.
- Calculate volume of a rectangular solid, given the net.
- Calculate and compare volumes of rectangular solids.

Basic students:

- May be able to determine area of some geometric figures.
- May be able to determine the volume of some three-dimensional figures.

Below basic students:

- Calculate the circumference of a circle
- Understand the relationship between circumference and revolutions

Specific Descriptors: Angle Relationships, Constructions, and Lines

Advanced students:

- Understand the effect on slope of parallel and perpendicular lines.
- Prove and use relationships between angles in polygons.
- Apply the Pythagorean theorem to solve word problems.
- Identify the steps of constructing parallel lines.

Proficient students:

- Prove and use relationships between angles in triangles.
- Use the Pythagorean theorem to find missing sides of a right triangle.
- Identify steps of constructing angle bisectors and perpendicular bisectors.

Basic students:

- Use relationships between angles in triangles and quadrilaterals.

Below basic students:

- May be able to identify types of triangles.

Specific Descriptors: Logic and Geometric Proofs

Advanced students:
- Prove triangles congruent.
- Apply and prove the properties of quadrilaterals.
- Complete indirect proofs.

Proficient students:
- Prove triangles congruent, given information and a diagram.
- Recognize counterexamples to a geometric statement.
- Apply the definition of similar triangles to types of triangles.
- Apply the triangle inequality theorem.

Basic students:
- Understand angle properties of parallel lines.
- Apply properties of quadrilaterals.
- Understand what is needed to prove triangles congruent.

Below basic students:
- Recognize which triangles are congruent.
- Apply properties of parallelograms.

Specific Descriptors: Trigonometry

Advanced students:
- Apply trigonometric functions to complex problems.
- Apply special right triangle properties to find missing parts in triangles.
- Solve problems regarding relationships of circles inscribed and circumscribed about polygons.

Proficient students:
- Apply the definitions of the basic trigonometric functions.
- Apply trigonometric functions to find unknown lengths in triangles.
- Find a missing side of an isosceles right triangle.

Basic students:
- Apply the relationship between a tangent to a circle and the diameter.
- Apply the relationship between an inscribed angle and its intercepted arc.
- Identify the effect of translations on geometric figures in the coordinate plane.

Below basic students:
- May identify a tangent to a circle.
- May identify an inscribed angle.

Descriptions for Algebra II Performance Levels

Summary-Level Descriptors

Advanced

Algebra II students at the **advanced** level have a strong understanding of rational expressions. These students are able to manipulate polynomials, including long division. They are effective problem solvers and have a strong understanding of how to solve quadratic equations in a variety of situations. These students understand the fundamental concepts of conic sections and their equations. Advanced students have a strong understanding of logarithmic functions, including the properties of logarithms. They have a strong understanding of probability and statistics, including conditional probability.

Proficient

Algebra II students at the **proficient** level have a solid understanding of polynomials, including factoring. These students are able to solve systems of equations and inequalities, including those with three variables. They have a solid understanding of exponents and exponential functions, including exponential growth and decay. Proficient students understand the concept of series, including arithmetic and geometric.

Basic

Algebra II students at the **basic** level have a limited understanding of algebraic expressions, including simplifying monomials and polynomials. These students have some understanding of the introductory concepts of quadratic equations, including the graph of a parabola. They have a limited understanding of exponential and logarithmic functions. The basic student is able to solve simple problems involving functions and polynomials.

Below Basic

Algebra II students at the **below basic** level have a minimal understanding of the basic concepts of Algebra II, including solving equations. These students have some understanding of polynomials and algebraic expressions. They have minimal understanding of logarithms and some understanding of complex numbers, including the ability to identify a complex number. They have minimal understanding of exponential functions.

Specific Descriptors: Exponents and Logarithms

Advanced students:

- Evaluate logarithmic expressions using properties of logarithmic functions.
- Judge the validity of an exponential statement.
- Apply exponential properties to problems involving half-life of radioactive substances.

Proficient students:

- Determine when a rational expression is true for all, some, or no values of x.
- Derive and understand the inverse relationship between exponential functions and logarithmic functions.
- Solve problems of exponential growth and decay.
- Judge the validity of the simplification of an exponential expression.

Basic students:

- Derive the exponential growth equation, given a data set.
- Apply the inverse relationship between exponential functions and logarithmic functions to solve problems.

Below basic students:

- May be able to recognize an exponential function.

Specific Descriptors: Polynomials and Rational Expressions

Advanced students:

- Perform long division of polynomials.
- Perform operations on complicated rational polynomial expressions.

Proficient students:

- Simplify and add complicated rational polynomial expressions with positive exponents.
- Factor polynomials involving sum and difference of cubes.
- Perform long division of polynomials with no remainders.
- Solve systems of linear equations or inequalities with two or three variables by graphing.

Basic students:

- Perform division of polynomials with monomial divisors and no remainders.
- Solve absolute value equations.
- Multiply polynomials.
- Solve systems of linear equations or inequalities with two variables by graphing.

Below basic students:

- Solve word problems using systems of linear equations with two variables.
- Factor the difference of squares.
- Multiply binomials.

Specific Descriptors: Quadratics, Conics, and Complex Numbers

Advanced students:

- Solve challenging rational quadratic equations with variables in the denominator.
- Simplify and perform operations on complex numbers.
- Convert a general quadratic equation into the standard form of a conic section by completing the square.
- Determine the parts of a conic graph given the standard form of a conic equation.

Proficient students:

- Multiply and plot complex numbers.
- Derive the x-intercepts of the graph of a quadratic function.
- Solve quadratic word problems.

Basic students:

- Identify the graph of a parabola, given the equation in standard form.
- Determine the effects on the graph of a parabola of changes in a, b, and c in a quadratic equation.
- Add and subtract complex numbers.

Below basic students:

- May be able to identify a complex number.

Specific Descriptors: Series, Combinatorics, and Statistics and Probability

Advanced students:

- Identify terms of expanded complex binomial expressions.
- Calculate the probability of independent and conditional events.

Proficient students:

- Simplify problems involving composition of functions.
- Expand a binomial expression raised to a positive integer power.
- Calculate the sum of an infinite geometric series.
- Find the nth term of an arithmetic series.

Basic students:

- Expand a simple binomial expression raised to a positive integer power.
- Perform addition and subtraction of functions.

Below basic students:

- Identify the steps to calculating variance, given a data set.
- Justify steps in simplifying polynomial expressions using real number properties.

Descriptions for Integrated Mathematics I Performance Levels

Summary-Level Descriptors

Advanced

Integrated Math I students at the **advanced** level have a strong understanding of number properties. These students understand the steps involved in problem solving. They have a solid understanding of polynomials, including simplifying rational expressions. These students understand the fundamental components of a graph's linear functions, including the point-slope formula. Advanced students have a solid understanding of higher-level algebra skills, including the quadratic formula. They understand how to solve problems involving geometric shapes, including how changes in dimension affect the surface area and volume of a figure.

Proficient

Integrated Math I students at the **proficient** level have a solid understanding of real-world applications of algebra, including solving linear equations and inequalities. These students have some understanding of functions and rational expressions, including factoring. They have some understanding of the graphs of linear equations and inequalities. The proficient student can apply common formulas to solve problems, including the quadratic formula. These students understand the general concepts of geometry, including volume and surface area.

Basic

Integrated Math I students at the **basic** level have a limited understanding of number sense. These students understand the concept of a variable, including simplifying algebraic expressions. They have some understanding of rational expressions. The basic student has a beginning understanding of linear equations, including the *x*- and *y*-intercepts of a linear function. They have some understanding of polynomials, including combining like terms. These students have a limited understanding of geometric shapes, including the classification of polygons.

Below basic

Integrated Math I students at the **below basic** level have a minimal understanding of the properties of real numbers. These students are able to simplify problems involving exponents. They have a minimal understanding of rational expressions. These students have a beginning understanding of the relationship between linear equations and their graphs, including whether or not a point lies on the graph of an equation. The below basic student has little understanding of the higher-level concepts of Algebra I, including factoring polynomials. These students have a limited understanding of two-dimensional shapes in geometry, including the area of triangles and rectangles.

Specific Descriptors: Numbers and Operations

Advanced students:
- Judge the validity of steps in a procedure using properties of the real number system.

Proficient students:
- Solve word problems using linear equations and inequalities.

Basic students:
- Recognize opposites on a number line.
- Simplify expression in one variable.
- Determine whether a statement involving properties of real numbers is true sometimes, always or never.

Below basic students:
- Understand and use rules of exponents.

Specific Descriptors: Functions and Expressions

Advanced students:
- Perform operations and simplify complex rational expressions, including those involving factoring.

Proficient students:
- Simplify rational expressions, including factoring.

Basic students:
- Perform operations with simple rational expressions.

Below Basic students:
- May be able to perform some operations involving simple rational expressions.

Specific Descriptors: Geometry

Advanced students:
- Find volume, area, and lateral area of common geometric shapes, and recognize how changes in dimensions affect these values.
- Recognize proofs of theorems using coordinate geometry.

Proficient students:
- Find volume, area, and lateral area of common geometric shapes.
- Solve problems involving interior or exterior angles of regular polygons.

Basic students:

- Compute circumference, area, and surface area of common geometric shapes.
- Classify polygons using interior or exterior angles.

Below basic students:

- May be able to determine the area of rectangles and triangles.

Specific Descriptors: Graphing

Advanced students

- Derive linear equations using point-slope formula.
- Recognize the relationship of slopes between parallel and perpendicular lines.

Proficient students:

- Recognize the region defined by an inequality.

Basic students:

- Construct a linear equation from given data.
- Find x and y intercepts of a linear equation.

Below basic students:

- Determine whether a point lies on a given line using the equation of the line.

Specific Descriptors: Quadratics and Polynomials

Advanced students:

- Use the quadratic formula to find the roots of a second-degree polynomial.
- Are familiar with the proof of the quadratic formula by completing the square.
- Solve quadratic equations by completing the square.

Proficient students:

- Factor second-degree polynomials.
- Solve quadratic equations by factoring.
- Recognize how to use the quadratic formula to solve quadratic equations.

Basic students:

- Perform operations with polynomials.
- Apply basic factoring techniques to second-degree polynomials.

Below basic students:

- Apply basic factoring techniques to second-degree polynomials.

Descriptions for Integrated Mathematics II Performance Levels

Summary-Level Descriptors

Advanced

Integrated Math II students at the **advanced** level are able to solve real-world problems involving quadratic equations. They understand the properties of polygons, including quadrilaterals, and are able to apply that knowledge to solve problems. The advanced student has a good understanding of logic and is able to prove basic theorems of geometry. These students have a strong understanding of the concept of congruence. They understand the standard trigonometric functions and are able to solve problems such as finding the missing side of a triangle. Advanced students also understand the concept of probability, including the probability of an independent event.

Proficient

Integrated Math II students at the **proficient** level have some understanding of algebra concepts, including real-world rate problems. These students have a good understanding of the relationships between angles in geometric figures, including parallel lines and transversals. They are able to perform basic geometric constructions. The proficient student has some understanding of the concept of a geometric proof, including the recognition of necessary theorems and proofs by contradiction. These students have a limited understanding of the concepts of trigonometry, including the definition of the three basic trigonometric functions. They also have a limited understanding of probability, including permutations and combinations.

Basic

Integrated Math II students at the **basic** level have a limited understanding of quadratic functions, including the concept of *x*-intercepts of a function. These students have some understanding of the various types of angles found in geometry, including complementary and supplementary. They have a limited understanding of the concept of congruence and coordinate geometry, including translations, reflections, and rotations. The basic student has a minimal understanding of probability, including the probability of an independent event.

Below Basic

Integrated Math II students at the **below basic** level have a minimal understanding of quadratic equations, including the domain and range of a function. These students have a limited understanding of the key concepts of geometry, including the recognition of types of angles and congruent figures. The below basic student has a minimal understanding of coordinate geometry. In addition, these students have a limited understanding of statistics and probability, including simple probability.

Specific Descriptors: Algebra I

Advanced students:

- Manipulate quadratic equations to solve physical problems.
- Solve absolute value equations.
- Solve word problems including percent mixture problems using algebraic techniques.
- Determine the number of points at which the graph of a quadratic function will intersect the x-axis.

Proficient students:

- Recognize counterexamples to logical arguments.
- Solve word problems including rate problems using algebraic techniques.
- Find the domain and range of a function based on a graph.

Basic students:

- Recognize the x-intercepts on the graph of a quadratic function.
- Recognize the equation that should be used to solve a word problem.
- Use quadratic equations in standard form to solve physical problems.

Below basic students:

- Identify a graph that represents a quadratic function.
- Identify the domain and range of a function based on a graph.
- Make logical deductions.

Specific Descriptors: Algebra II

Advanced students:

- Solve problems involving combinations and permutations, and use them to compute probability.
- Know and can use independent events to compute probability.

Proficient students:

- Use simple combinations and permutations to compute probability.
- Know the definition of independent events, and can identify them.

Basic students:

- Compute the probability of a simple independent event.

Below basic students:

- May be able to determine the probability of a simple independent event.

Specific Descriptors: Angles

Advanced students:
- Perform basic geometric constructions.
- Know and use the properties of polygons.
- Use the Pythagorean theorem to solve problems relating to real-world situations.

Proficient students:
- Use the Pythagorean theorem to find the length of a missing leg.
- Recognize steps of basic geometric constructions.
- Identify theorems necessary for proofs of angle relationships.

Basic students:
- Use the properties of complementary, supplementary, vertical, and exterior angles to solve problems.

Below Basic students:
- May be able to identify various types of angles.

Specific Descriptors: Logic and Proofs

Advanced students:
- Know how to prove triangle congruency and similarity.
- Recognize counterexamples of logical arguments.
- Know and use multiple properties of quadrilaterals.

Proficient students consistently:
- Recognize steps in proofs, including proofs by contradiction.
- Know properties of angles formed by parallel lines cut by transversals.

Basic students usually:
- Know and use properties of quadrilaterals.
- Know how to identify congruent or similar triangles.

Below basic students:
- May be able to identify congruent figures

Specific Descriptors: Trigonometry

Advanced students:

- Know and can use trigonometric ratios to solve real-world problems.
- Use angle and side relationships for special right triangles to find unknown values.

Proficient students:

- Know and can use trigonometric ratios to find unknown values.
- Use side relationships for special right triangles.

Basic students:

- Solve problems involving translations, rotations and reflections.

Below basic students:

- May identify some translations, rotations, and reflections.

Descriptions for Integrated Mathematics III Performance Levels

Summary-Level Descriptors

Advanced

Integrated Math III students at the **advanced** level have a strong understanding of the properties of circles, including inscribed and circumscribed polygons. These students have a solid understanding of the key concepts of algebra, including simplifying polynomials as well as factoring. They have a strong understanding of the basic elements of exponents and logarithms. The advanced student has a solid understanding of functions, including quadratic equations and complex numbers. These students understand measures of statistics, including variance and standard deviation.

Proficient

Integrated Math III students at the **proficient** level have a solid understanding of some aspects of geometry, including chords, secants, and tangents of a circle. These students have a solid understanding of solving equations and inequalities, including absolute value. They have some understanding of the properties of logarithms and exponents. The proficient student understands how to graph functions, including parabolas, and knows how to determine the roots of the function based on the graph. These students have some understanding of series and sequences, including finding the sum of arithmetic and geometric series.

Basic

Integrated Math III students at the **basic** level have a limited understanding of geometry, including circles, secants, and chords. These students have some understanding of rational expressions, including polynomials. They have a limited understanding of exponents, including the evaluation of expressions. These students have a minimal understanding of the translation of the graph of a quadratic equation. The basic student has some understanding of the theorems in Algebra II, such as the binomial theorem, and how to apply them to solve problems. These students have limited understanding of arithmetic and geometric series, including the common ratio or difference.

Below Basic

Integrated Math III students at the **below basic** level have little understanding of the properties of the relationships between circles and segments, including chords. These students have minimal understanding of the basic concepts of Algebra II, including simplifying polynomials. They have little understanding of exponents and logarithms. The below basic student has a limited understanding of quadratic functions. These students may be able to identify the graph of a quadratic equation. They have little understanding of statistics and probability.

Specific Descriptors: Exponents

Advanced students:

- Evaluate whether statements involving rational expressions, radical expressions, or logarithmic or exponential functions are valid.
- Understand the properties of logarithms, and are able to judge whether they have been applied correctly.

Proficient students consistently:

- Solve problems involving logarithms and exponents and identify their approximate values.
- Understand the properties of real numbers and exponents.

Basic students usually:

- Understand and can use the inverse relationship between exponents and logarithms.
- Evaluate whether simple statements involving rational expressions, radical expressions, or logarithmic or exponential functions are valid.

Below basic students sometimes:

- Use data to identify exponential functions.

Specific Descriptors: Geometry

Advanced students:

- Solve problems involving inscribed angles, and inscribed and circumscribed polygons of circles.

Proficient students:

- Solve problems involving chords, secants, tangents and inscribed angles.

Basic students:

- Solve problems involving chords, secants, and tangents.

Below basic students:

- Identify chords and tangents in a circle.

Specific Descriptors: Polynomials

Advanced students:

- Perform operations with polynomials and rational expressions including long division and reducing by factoring.
- Factor polynomials including the sum and difference of two cubes.
- Solve complex word problems using linear systems of equations and inequalities in two or three variables.

Proficient students:

- Simplify rational expressions with negative exponents in the denominator.
- Solve word problems using systems of linear inequalities.
- Solve equations and inequalities involving absolute value.

Basic students:

- Perform simple operations with polynomials.
- Factor polynomials, including differences of squares.
- Solve word problems using systems of linear equations.

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Below basic students:

- Perform simple operations with binomials.

Specific Descriptors: Quadratics

Advanced students:

- Perform operations with real and complex numbers.
- Solve quadratic equations by factoring, completing the square, or using the quadratic formula.

Proficient students:

- Determine how the graph of a parabola has been translated.
- Graph and find the zeros of quadratic functions.
- Know how real and complex numbers are related.

Basic students:

- Determine some of the effects of changing a, b or c in the equation y = a(x-b)^2 + c on the graph of the function.

Below basic students:

- May be able to recognize changes in the graphs of quadratic equations.

Specific Descriptors: Statistics, Data Analysis, and Probability

Advanced students:

- Solve problems using conditional probability.
- Find the general term and sums of arithmetic and geometric series, both infinite and finite.
- Know and use the binomial theorem to expand more complex binomial expressions.
- Know how to compute variance and standard deviation.

Proficient students:

- Perform arithmetic operations on functions, including compositions.
- Find the sums of arithmetic and geometric series, both infinite and finite.

Basic students:

- Know and use the binomial theorem to expand simple binomial expressions.
- Identify the common ratio or difference in geometric or arithmetic series.

Below basic students:

- Use properties from the number system.
- Combine and simplify functions.

Science

Descriptions for Grade 5 Science Performance Levels

Summary-Level Descriptors

Advanced

Students in grade five at the **advanced** level are able to use science knowledge to make prediction about life, earth, and physical science phenomena. Advanced students have an understanding of principles of the water and rock cycle and are able to describe outcomes based on changes to the respective cycles. They are able to make predictions about organisms' characteristics based on environment. Advanced students understand the role of body systems and the interrelatedness of each. Advanced students grasp how properties of materials affect how they conduct electricity and react with other substances. Advanced students demonstrate movements of celestial bodies and describe how each movement affects other bodies. They are able to take scientific information and plan follow-up studies to broaden understanding.

Proficient

Students in grade five at the **proficient** level demonstrate a good understanding of Earth, space, and living systems. They are able to conduct investigations based on questions and report data. Proficient students are able to describe the importance of the body's systems. They are able to compare properties of substances. They are able to describe which traits are beneficial to organisms and how those traits aid in survival. Proficient students know that planets and other bodies have predictable patterns. They are able to control variables when conducting investigations. They are able to describe the components of the water cycle.

Basic

Students in grade five at the **basic** level show an understanding of Earth, space, and living systems. They are able to conduct investigations using instructions. Basic students are able to identify the functions of the body's systems. They are able to describe properties of substances and some traits that are beneficial to organisms. They are able to identify components of the water cycle and can identify planets and other extraterrestrial bodies. They are able to make and record observations

Below Basic

Students in grade five at the **below basic** level are able to identify Earth and the Sun. They are able to identify water and rock cycle diagrams. Below basic students can use a magnet to identify the magnetic properties of different substances.

Specific Descriptors: Earth Science

Advanced students:

- Predict outcomes due to interactions between evaporation, condensation, and precipitation.
- Know that about 97 percent of Earth's water is salt water.
- Predict changes in position of planets and other celestial bodies.
- Describe the effects of uneven heating from the Sun.
- Illustrate and model how different forces shape Earth's surface.
- Use knowledge of conservation and resource preservation to devise plans given a scenario.
- Illustrate how changes to Earth's surface are caused by both slow and fast processes.
- Use defining properties to identify rocks and minerals.
- Describe the changes rocks go through in different stages of the rock cycle.

Proficient students:

- Describe interactions between evaporation, condensation, and precipitation.
- Identify most of Earth's water as salt water in oceans.
- Model movement of planets and other celestial bodies.
- Determine the effects of uneven heating from the Sun.
- Describe how forces shape Earth's surface.
- Apply knowledge of conservation and resource preservation.
- Describe how changes to Earth's surface can be caused by both slow and fast processes.
- Use charts to identify rocks and minerals.
- Identify how processes in the rock cycle determine rock properties.

Basic students:

- Demonstrate knowledge of Earth's water cycle.
- Identify water sources as either freshwater or salt water.
- Identify the Sun as the largest body in our solar system.
- Identify forces that shape Earth's surface.
- Identify ways to conserve water and preserve resources in everyday life.
- Identify changes to Earth's surface as being caused by either slow or fast processes.
- Describe differences in rocks and minerals.
- Demonstrate knowledge of the rock cycle.

Below basic students:

- Identify Earth's water cycle.
- Identify water as a natural resource.
- Identify the Sun.
- Identify forces that affect Earth.
- Identify ways to conserve water in everyday life.
- Identify changes to Earth's surface.
- Identify differences in rocks and minerals.

- Identify the rock cycle.

Specific Descriptors: Life Science

Advanced students:

- Describe how body systems are interrelated.
- Predict advantages of physical and physiological characteristics based on the environment.
- Map complex interactions between organisms in an ecosystem.
- Describe how living and nonliving components of the ecosystem affect each other.
- Create food web diagrams given a scenario.
- Describe specific benefits provided by different microorganisms.
- Create criteria for grouping objects.
- Use observations to make inferences and predict future events.

Proficient students:

- Identify which body functions are performed by the respiratory, circulatory, digestive, and excretory systems.
- Describe advantageous characteristics of each system.
- Describe how organisms compete for food and other resources.
- Illustrate how living and nonliving components of the ecosystem affect each other.
- Make predictions based on a food web given a scenario.
- Describe benefits provided by microorganisms.
- Classify objects based on appropriate criteria.
- Make inferences based on observations.

Basic students:

- Identify some body functions of the respiratory, circulatory, digestive, and excretory systems.
- Identify some advantageous characteristics of each system.
- Identify organisms that compete for food and other resources.
- Describe how living and nonliving components of the ecosystem affect each other.
- Describe the components of a food web.
- Identify benefits provided by microorganisms.
- Use tables and charts to group objects.
- Record observations.

Below basic students:

- Describe characteristics of organisms.
- Identify that organisms compete for resources.
- Identify components of the ecosystem as either living or nonliving.

- Describe the components of a food web.
- Describe microorganisms.
- Sort objects by different characteristics.
- Make observations.

Specific Descriptors: Physical Science

Advanced students:

- Predict conductivity of substances based on their properties.
- Describe molecular differences between products and reactants in a chemical reaction.
- Illustrate how atoms in solids are arranged in well-ordered arrays.
- Form prescribed designs using iron shavings and magnets.
- Identify sources for the essential elements that compose living organisms.
- Describe how to make a compass.
- Describe ways to determine if a metal is pure or is a mixture of more than one metal.
- Separate mixtures using preselected materials.
- Predict the types of energy conversions resulting from various scenarios.
- Illustrate differences between physical and chemical reactions.
- Plan, conduct, and write a scientific report for a scientific investigation.
- Plan future investigations to further explore observations and results from scientific reports.
- Devise ways to measure quantifiable characteristics of solids.

Proficient students:

- Identify metals as good conductors of heat and electricity.
- Describe differences between products and reactants in a chemical reaction.
- Identify how the arrangements of atoms in solids can be affected by outside forces.
- Describe how magnetic fields extend beyond magnets and are strongest at the poles.
- Identify the essential elements that compose living organisms.
- Describe how a compass works.
- Describe how some materials are composed of a single element and others are composed of more than one element.
- Plan ways to separate mixtures.
- Identify ways that electrical energy is converted to heat, light, and motion.
- Describe differences between physical and chemical reactions.
- Plan an investigation with appropriate variables.
- Identify the types of information to include in a scientific report.
- Measure the volume of a solid object.

Basic students:

- Identify objects as conductors or nonconductors.

- Identify that the products and reactants in a chemical reaction have different properties.
- Describe how magnetic fields affect other objects.
- Know that living organisms are made of only a few elements and identify what they are.
- Use a compass.
- Identify that some materials are composed of a single element and others are composed of more than one element.
- Identify how mixtures can be separated.
- Identify that electrical energy can be converted to heat, light, and motion.
- Conduct an investigation using instructions.
- Answer questions using a scientific report.
- Calculate the volume of solid objects given the dimensions.

Below basic students:

- Describe differences in substances.
- Describe changes to an object when heated or cooled.
- Use a magnet.
- Identify some of the essential elements of living things.
- Identify a compass as a tool to determine direction.
- Identify that mixtures can be separated.
- Identify when heat, light, and motion are generated.

Descriptions for Grade 8 Science Performance Levels

Summary-Level Descriptors

Advanced

Students in grade eight at the **advanced** level comprehend principles of density, forces, motion, and the structure of matter. They understand and can explain why different units of measurements are appropriate in different cases. Advanced students are able to define what a chemical change is and describe the defining characteristics of acids and bases. They are able to explain the placement on a periodic table of elements. They can complete a data table using existing information.

Proficient

Students in grade eight at the **proficient** level demonstrate a good understanding of density, forces, motion, and the structure of matter. They can select proper units of measurement. Proficient students can use data to define relationships between variables and identify solutions as acids, bases, or neutrals. They are able to identify groups on the periodic table and describe the general characteristics of these groups. Proficient students can draw relationships from graphs and data tables.

Basic

Students in grade eight at the **basic** level are able to identify the basic concepts of density, force, motion, and structure of matter. They are able to recognize the need for different units of measurement according to the size of what is being measured. They are able to describe a substance as being a solid, liquid, or gas. Basic students are able to identify subatomic particles on a diagram.

Below Basic

Students in grade eight at the **below basic** level can identify properties of substances. They know that atoms have protons, neutrons, and electrons. They are able to sort objects from least dense to most dense. They are able to identify phase changes and properties of substances.

Specific Descriptors: Earth in the Solar System

Advanced students:
- Describe why some units of measurement are appropriate and others are not.
- Describe how the characteristics of a body in space affect its behavior.

Proficient students:
- Use appropriate units to measure distances.
- Identify objects in space by their characteristics.

Basic students:
- Choose units of measurement based on the scale of distance.
- Identify that objects in space have different properties, such as size and motion.

Below basic students:
- Choose units of measurement.
- Identify objects in space.

Specific Descriptors: Structure of Matter

Advanced students:
- Predict an element's placement on the periodic table based on its properties.
- Describe the groupings on the periodic table.
- Describe interactions between protons, neutrons, and electrons.
- Illustrate ways to make substances change their physical state.

Proficient students:
- Classify substances by their properties.
- Identify groups on the periodic table.
- Describe differences between protons, neutrons, and electrons.
- Identify molecular motion associated with solids, liquids, and gases.

Basic students:
- List properties of substances.
- Identify properties of substances from which they are classified on a periodic table.
- Identify protons, neutrons, and electrons.
- Describe solids, liquids, and gases.

Below basic students:
- Identify properties of substances.
- Sort substances by characteristics.
- Recall that atoms have protons, neutrons, and electrons.
- Identify solids, liquids, and gases.

Specific Descriptors: Forces, Density, and Buoyancy

Advanced students:
- Calculate density.
- Illustrate why an object will float or sink with respect to density and buoyant forces.
- Describe how changes in force and mass affect movement.

Proficient students:
- Describe how density is calculated.
- Describe why an object will float or sink.
- Describe the relationship between force, mass, and movement.

Basic students:
- Identify density as a function of mass and volume.
- Predict whether an object will float or sink based on its density and the density of the fluid.
- Identify that force is needed to make objects move.

Below basic students:
- Sequence objects by density.
- Identify the acts of floating and sinking.
- Show how to move objects.

Specific Descriptors: Motion

Advanced students:
- Extrapolate data from speed or position versus time graphs to predict future trends.
- Describe how velocity changes due to either speed or direction changes.

Proficient students:
- Interpret speed or position versus time relationships on graphs.
- Identify velocity as a function of speed and direction.

Basic students:
- Recognize speed or position versus time graphs.
- Describe speed and direction.

Below basic students:
- Identify movement as fast or slow.
- Identify rate of movement as either changing or constant.

Specific Descriptors: Reactions and Living Systems

Advanced students:

- Illustrate why heat is released or absorbed in chemical reactions.
- Illustrate how changes to conditions cause phase changes.
- Describe why carbon is able to combine in many ways in living organisms.
- Define acids, bases, and neutral solutions using defining characteristics.
- Describe how matter changes in all reactions, yet is conserved.
- Predict changes to reactants as they undergo chemical reactions.
- Define chemical and physical properties.

Proficient students:

- Describe how heat is released or absorbed in chemical reactions.
- Describe how phase change affects molecular arrangements or substances.
- Identify how carbon combines in many ways and is part of all living things.
- Identify acids, bases, and neutral solutions using pH scale.
- Demonstrate understanding that matter is conserved in all reactions.
- Describe how reactants form products with different chemical properties.
- Differentiate between chemical and physical properties.

Basic students:

- Determine if heat is released or absorbed in a chemical reaction.
- Describe phase changes in substances.
- Identify carbon as being part of all living things.
- Identify acids, bases, and neutral solutions.
- Show that the amount of matter doesn't change during reactions.
- Describe differences between reactants and products in a reaction.
- Identify chemical and physical properties of substances.

Below basic students:

- Identify when a solution's temperature increases or decreases.
- Identify phase changes is substances.
- Identify acids, bases, and neutral solutions.
- Describe properties of substances.

Specific Descriptors: Investigation and Experimentation

Advanced students:

- Explain reasons for trends represented on a graph.
- Extrapolate data from existing trends.

Proficient students:

- Describe trends on a graph.
- Describe relationships between variables on a data table.

Basic students:

- Interpret data on a graph.
- Identify variables on a data table.

Below basic students:

- Identify differences between graphs and tables.

Descriptions for Grade 10 Science Performance Levels

Summary-Level Descriptors

Advanced

Students in grade ten at the **advanced** level are able to construct graphs and tables from data and design investigations to answer scientific questions. They can predict population changes due to changes in environment and in other populations. They are able to describe how body systems affect the functioning of other body systems. The advanced student understands properties of alleles, genotypes, and phenotypes.

Proficient

Students in grade ten at the **proficient** level demonstrate a good understanding of graphs and tables, investigative variables and controls, and data interpretation. The proficient student understands population dynamics and how they change with environmental changes. They grasp the process of photosynthesis. The proficient student understands the function and importance of body systems. They understand the nature of alleles and genetic expression in physical traits. Proficient students understand the differences between mitosis and meiosis and the products of each.

Basic

Students in grade ten at the **basic** level are able to use tables and graphs to answer questions. They can identify variables from a scientific investigation and understand its purpose. Basic students know the major body systems. They know that genes are carried on alleles and that these alleles are transferred to offspring through sexual reproduction.

Below Basic

Students in grade ten at the **below basic** level can differentiate between tables and graphs. They know the body systems and can identify scientific investigations. They know that traits are carried to offspring through sexual reproduction.

Specific Descriptors: Ecology

Advanced students:

- Know how the resources available within different ecosystems (e.g. wetland, desert, forest, ocean, etc.) determine the types of organisms that can be supported.
- Can construct and interpret appropriate graphs, charts, or tables from data.
- Know the causes and effects of relative rates of birth, immigration, emigration, and death within an ecosystem.
- Know the process of photosynthesis in plants and the roles of water, carbon, and nitrogen cycles.
- Can differentiate between the functions of food webs and food chains, and the specific roles of the organisms involved.

Proficient students:

- Describe how ecosystems are defined by the resources available in them.
- Construct appropriate graphs, charts, or tables from data.
- Describe population dynamics within an ecosystem, including birth rates, death rates, emigration, and immigration.
- Describe the chemical reaction during the process of photosynthesis.
- Describe how the water, carbon, and nitrogen cycles affect ecosystems.
- Identify niches of organisms based on food web diagrams.

Basic students:

- Identify ecosystems by their characteristics.
- Interpret data from graphs, charts, and tables.
- Identify phenomena that affect population size.
- List the products and reactants for the process of photosynthesis.
- Identify water, carbon, and nitrogen cycles as processes that affect ecosystems.
- Identify interactions on food web diagrams.

Below basic students:

- List ecosystems.
- Identify graphs, charts, and tables.
- Define emigration and immigration.
- Describe the importance of photosynthesis to plants.
- Identify water, carbon, and nitrogen as essential parts of an ecosystem.
- Identify a food web diagram.

Specific Descriptors: Evolution

Advanced students:

- Make sound scientific inferences based on fossil evidence.
- Make predictions about a population's survival based on physical traits, mutation, and environmental changes.
- Describe how some recessive or disadvantageous alleles remain in the gene pool.
- Describe how natural selection acts on phenotypes, as opposed to genotypes.

Proficient students:

- Describe the importance of fossil evidence to understanding the history of life.
- Describe how physical traits and environmental conditions affect a population's survival.
- Describe how some recessive or disadvantageous alleles can appear in individuals without ill effects.
- Identify that natural selection acts on phenotypes, as opposed to genotypes.

Basic students:

- Identify types of fossil evidence that are important to understanding the history of life.
- Identify physical traits and environmental conditions that affect populations' survival.
- Identify recessive and dominant alleles.

Below basic students:

- Identify types of fossil evidence.
- Identify physical traits and environmental conditions.

Specific Descriptors: Genetics

Advanced students:

- Construct genetic crosses based on a scenario to predict possible phenotypes of offspring.
- Illustrate how inherited traits are determined by one or more genes.
- Differentiate between the processes of mitosis and meiosis.
- Predict complimentary pairs and matches, given strands of DNA and RNA.

Proficient students:

- Use genetic crosses to predict the phenotypes of offspring.
- Describe how inherited traits are determined by one or more genes.
- Differentiate between cells generated by mitosis and those generated by meiosis.
- Match the organic bases found in DNA and RNA.

Basic students:

- Use genetic crosses to show possible outcomes.
- Identify that inherited traits are determined by one or more genes.
- Identify gametes as being generated by meiosis.
- List the organic bases found in DNA and RNA.

Below basic students:

- Identify genetic crosses.
- Identify inherited traits.
- Identify gametes.
- Identify the organic bases found in DNA and RNA.

Specific Descriptors: Cell Biology

Advanced students:

- Describe interrelationships between organelles in plant and animal cells.
- Describe how structural differences in animal, plant, and bacterial cells help with organism function.

Proficient students:

- Identify functions of organelles in plant and animal cells.
- Describe the basic cell structures of animals, plants, and bacteria.

Basic students:

- Identify organelles in plant and animal cells.
- Describe cells as being from animals, plants, or bacteria.

Below basic students:

- Identify that cells have organelles, which have specific functions.
- Identify that cells from animals, plants, and bacteria have different structures.

Specific Descriptors: Physiology

Advanced students:

- Describe changes in skeletal and muscle systems that cause changes in movement.
- Illustrate how structure and function affect a system's ability to perform functions.
- Describe how the different body defense mechanisms prevent infection.
- Illustrate how major body systems interact to maintain homeostasis.

Proficient students:

- Describe how bones and muscles work together in the human body.
- Describe how structure and function are related in organ systems.

- Identify the various mechanisms for preventing infection.
- Describe how major body systems interact to provide cells with oxygen, nutrients and remove wastes.

Basic students:
- Identify that bones and muscles work together in the human body.
- Identify that structure and function are related in organ systems.
- List ways bodies are infected.
- List major body systems.

Below basic students:
- Identify bones and muscles.
- List major body systems.

Specific Descriptors: Investigation and Experimentation

Advanced students:
- Interpret graphs and tables.
- Design a scientific investigation given a question.
- Assign controls within a scientific investigation.

Proficient students:
- Draw conclusions from trends in graphs and tables.
- Identify weaknesses in the design of a scientific investigation.
- Identify the need for controls within a scientific investigation.

Basic students:
- Interpret graphs and tables.
- Identify variables in a scientific investigation.
- Define “control” within a scientific investigation.

Below basic students:
- Identify graphs and tables.
- Identify components of a scientific investigation.

Appendix B

Number of Test Questions Used in PLD Development
By Subject, Grade, Reporting Category, and Achievement Level

English Language Arts

Grade 2

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension			4	4	4	12
Literary Response			3	4	1	8
Word Analysis	1	4	4	4	4	17
Written Conventions			4	4	4	12
Writing Strategies			2	4	4	10
Subtotals	1	4	17	20	17	59

Grade 3

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension		2	4	4	4	14
Literary Response		4	4	4	1	13
Word Analysis		4	4	4	1	13
Written Conventions		4	4	4	4	16
Writing Strategies			4	4	1	9
Subtotals		14	20	20	11	65

Grade 4

Reporting Category*	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension			4	4	4	12
Literary Response			4	4	1	9
Word Analysis		1	4	4	4	13
Written Conventions		1	4	4	4	13
Writing Strategies			2	4	4	10
Subtotals		2	18	20	17	57

* Note essays for Writing Applications were handled separately.

Grade 5

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension	1	1	4	4	4	14
Literary Response		4	4	4	2	14
Word Analysis		3	4	4	4	16
Written Conventions		4	4	4	4	16
Writing Strategies		1	4	4	4	13
Subtotals	1	13	20	20	18	72

Grade 6

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension		1	4	4	4	13
Literary Response			4	4	4	12
Word Analysis		2	4	4	4	14
Written Conventions		4	4	4	1	13
Writing Strategies		2	4	4	4	14
Subtotals		9	20	20	17	66

Grade 7

Reporting Category*	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension		3	3	3	2	11
Literary Response		2	3	3	3	11
Word Analysis		3	3	3	2	11
Written Conventions		3	3	3	3	12
Writing Strategies		2	3	3	3	11
Subtotals		13	15	15	13	56

* Note essays for Writing Applications were handled separately.

Grade 8

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension		3	4	4	4	15
Literary Response		1	4	4	4	13
Word Analysis		1	4	1	4	10
Written Conventions		2	4	4	4	14
Writing Strategies		3	4	4	3	14
Subtotals		10	20	17	19	66

Grade 10 (CAHSEE)

Reporting Category*	Below Basic	Basic	Proficient	Advanced	Total
Reading Comprehension	3	3	3	3	12
Literary Response	3	3	3	2	11
Word Analysis	3	3	2	1	9
Written Conventions	1	3	3	3	10
Writing Strategies		3	3	2	8
Subtotals	10	15	14	11	50

* Note essays for Writing Applications were handled separately.

Mathematics

Grade 2

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		3	2	3	3	11
Measurement and Geometry	2	4	4	4	3	17
Number Sense	3	4	4	4	4	19
Statistics and Probability		3	1	4	4	12
Subtotals	5	14	11	15	14	59

Grade 3

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		2	4	4	4	14
Measurement and Geometry	2	4	4	4	4	18
Number Sense		4	4	4	4	16
Statistics and Probability	1	4	2	0	2	9
Subtotals		14	14	12	14	57

Grade 4

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		1	4	4	4	13
Measurement and Geometry		3	2	4	4	13
Number Sense	1	4	4	4	4	17
Statistics and Probability		2	3	0	1	6
Subtotals		10	13	12	13	49

Grade 5

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		4	3	4	4	15
Measurement and Geometry	1	2	2	4	4	13
Number Sense		2	4	4	4	14
Statistics and Probability	1	2	3		2	8
Subtotals		10	12	12	14	50

Grade 6

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		3	4	4	4	15
Measurement and Geometry			3	2	4	9
Number Sense		2	4	4	4	14
Statistics and Probability			4	4	4	12
Subtotals		5	15	14	16	50

Grade 7

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		2	4	4	4	14
Measurement and Geometry			2	4	4	10
Number Sense		1	2	4	4	11
Statistics and Probability		1	1	3	1	6
Subtotals		4	9	15	13	41

Grade 10 (CAHSEE)

Reporting Category	Below Basic	Basic	Proficient	Advanced	Total
Algebra I		4	4	4	12
Algebra and Functions	2	4	4	4	14
Measurement and Geometry	4	4	4	4	16
Number Sense	4	4	4	4	16
Statistics and Probability	4	4	4	2	14
Subtotals	14	20	20	18	72

End-of-Course Test: Integrated Mathematics I

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Functions and Expressions				4	4	8
Geometry			4	4	4	12
Graphing		1	4	4	1	10
Numbers and Operations		4	4	2	1	11
Quadratics and Polynomials		1	4	4	4	13
Subtotals		6	16	18	14	54

End-of-Course Test: Integrated Mathematics II

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra I		3	3	4	4	14
Algebra II			4	1	3	8
Angles			3	4	3	10
Logic and Proofs		2	4	4	4	14
Trigonometry			4	4	4	12
Subtotals		5	18	17	18	58

End-of-Course Test: Integrated Mathematics III

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra II, Exponents			4	4	4	12
Geometry		3	2		3	8
Polynomials		3	4	4	4	15
Quadratics			1	4	3	8
Statistics and Probability		2	3	4	4	13
Subtotals		8	14	16	18	56

End-of-Course Test: General Mathematics

General Math	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Algebra and Functions		1	4	4	4	13
Measurement and Geometry				4		4
Number Sense		1	2	4	8	15
Statistics and Probability		2		2	4	8
Subtotals		4	6	14	16	40

End-of-Course Test: Algebra I

Algebra I	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Functions and Expressions			1		4	5
Linear Equations				4	4	8
Numbers and Operations		2	4	4	4	14
Quadratics and Polynomials			3	4	4	11
Subtotals		2	8	12	16	38

End-of-Course Test: Geometry

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Volume and Area		1		4	**4**	9
Angles			4	4	4	12
Logic and Proofs	1	1	4	4	4	14
Trigonometry			4	4	4	12
Subtotals		2	12	16	16	47

End-of-Course Test: Algebra II

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Exponents and Series			4	4	**4**	12
Polynomials and Expressions		4	4	4	4	16
Quadratics, Conics, and Complex Numbers			4	4	4	12
Statistics and Probability		1	2	4	1	8
Subtotals		5	14	16	13	48

History/Social Science

Grade 8

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Ancient Civilizations		2	3	3	3	11
Late Antiquity and Middle Ages			3	3	3	9
Renaissance/Reformation		1	3	3	3	10
U.S. Constitution and Early Republic		2	3	3	3	11
Civil War and Its Aftermath		1	3	3	3	10
Subtotals		6	15	15	15	51

Grade 10

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Industrial Expansion			3	3	1	7
World War I		2	3	3	3	11
World War II		3	1	2	3	9
International Development		1	3	3	3	10
Modern Political Thought		3	2	3	3	11
Subtotals		9	12	14	13	48

Grade 11

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Industrialization		2	3	3	3	11
U.S. Between the World Wars			3	3	3	9
Post WW2 Domestic Issues		1	3	3	3	10
Post WW2 Foreign Affairs		1	2	3	3	9
American Political and Social Thought		1	0	3	3	7
Subtotals		5	11	15	15	46

Science

Grade 5

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Earth Sciences		4	4	4	2	14
Life Sciences		2	4	4	1	11
Physical Sciences		1	4	4	2	11
Investigation and Experimentation		2	2	2		6
Subtotals		9	14	14	5	42

Grade 8

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Earth in the Solar System			1		1	2
Life Sciences			1	2	4	7
Structure of Matter		2	2	2	2	8
Density and Buoyancy					1	1
Motion					3	3
Investigation and Experimentation			1	2		3
Subtotals		2	5	6	11	24

Grade 10 Life Sciences

Reporting Category	Far Below Basic	Below Basic	Basic	Proficient	Advanced	Total
Cell Biology		1			1	2
Ecology		1	1	3	1	6
Evolution			3		2	5
Genetics			1		4	5
Physiology			2	3		5
Investigation and Experimentation		1	2			3
Subtotals		3	9	6	8	26

Appendix C

PLD Workshop Instructions

CST (STAR) and CAHSEE Performance Level Descriptions

Overview and Training

Performance Level Descriptor (PLD) Workshop

Date:
Saturday, December 2, 2006

Presenter:
Dr. Lauress L. Wise
HumRRO

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What are Performance Levels?

- Also known as "Achievement Levels"
- Used in reporting student-level results from STAR and CAHSEE (10th grade census testing)
  - STAR results are reported at 5 levels:
    - Advanced
    - Proficient
    - Basic
    - Below Basic
    - Far Below Basic
  - CAHSEE results are reported at 4 levels
    - Advanced
    - Proficient
    - Pass (Basic)
    - Not Pass

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Performance Level Cut Scores

- Performance levels are defined by the minimum number of items (on a reference test form) a student has to answer correctly to reach a given performance level.
  - The minimum number is called a cut-score
  - For example, students have to answer 55% (or more) of the CAHSEE mathematics items correctly to reach passing.
  - Cut scores may be adjusted slightly for each new test form to account for small differences in test difficulty.
- A standard setting process was used to develop recommended cut scores for each achievement level (except the lowest) that were approved by the Board.
  - In this workshop, we must accept the achievement level cut-scores as given; our task is to develop descriptions of what students at each achievement level can/can not do.

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Policy Definitions from the State Boad of Education

- Advanced. This category represents a superior performance. Students demonstrate a comprehensive and complex understanding of the knowledge and skills measured by this assessment, at this grade, in this content area.
- Proficient. This category represents a solid performance. Students demonstrate a competent and adequate understanding of the knowledge and skills measured by this assessment, at this grade, in this content area. .
- Basic. This category represents a limited performance. Students demonstrate a partial and rudimentary understanding of the knowledge and skills measured by this assessment, at this grade, in this content area.
- Far Below / Below Basic. This category represents a serious lack of performance. Students demonstrate little or a flawed understanding of the knowledge and skills measured by this assessment, at this grade, in this content area.

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Use of Performance Level Descriptors

- PLDs are NOT a substitute for the Content Standards!
  - PLDs illustrate what students at each achievement level know and can do.
  - They provide documentation and coherence to the establishment and use of achievement levels.
  - They point back to the content standards.
- Short forms of the PLDs are used in reporting.
  - To communicate to parents and students what they can do and what they need to be able to do to reach the next level.
  - Not a substitute for more detailed diagnosis by teachers of the student's mastery of the individual content standards

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Developing the Performance Level Descriptors (PLDs)

- The steps we will follow to develop the PLDs are:
  1. Examine test questions that students at each achievement/performance level can answer.
  2. Develop descriptions of the knowledge and skills of students at each level.
  3. Show progressions across levels within each grade and across grades within each level.
  4. Nominate released items to be used as exemplars at each level.

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Recommended Format

- Each performance level descriptors should have:
  - A general statement for the subject as a whole
  - Specific statements of knowledge and skill related to each content strand/reporting category
- Performance level descriptors should show a logical progression from one level to the next
  - For both the general and specific statements
- Descriptors for each level should show a logical progression from one grade to the next.
  - To the extent permitted by the content standards for each grade.

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Progressions

- Alternative ways of showing progression
  - Different depth of knowledge
    - E.g.: recognize ➔ understand ➔ apply ➔ evaluate
  - Extent
    - E.g.: very limited ➔ limited ➔ (unqualified) ➔ extensive
  - Frequency
    - E.g.: rarely ➔ infrequently ➔ usually ➔ always
  - Consistency
    - E.g.: inconsistently ➔ usually ➔ consistently
  - What other progressions can you think of?

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Example of a PLD (IL): 8th Grade Reading Proficient

- The 8th grade readers who meet state standards comprehend a variety of types of literary and informational grade-appropriate texts.
  - These 8th graders understand and identify a majority of the important ideas in the text and can frequently support their ideas with relevant information from the text and from their own knowledge and experience.
  - The 8th grade readers at the "meets standards" level usually use knowledge of text structure to recall and understand important information.
  - These 8th graders that usually identify explicit main ideas and several supporting details.
  - The 8th grade readers at this level usually draw logical conclusions using evidence in the text and their own knowledge.
  - These 8th grade readers usually understand the broad meanings of a text such as theme or author's purpose and use clues in the text to understand basic character traits and motives.
  - "Meets standards" readers read grade-appropriate texts fluently, apply word analysis skills when needed to recognize words and use a variety of strategies to determine the meaning of words in the text.
  - Finally, the 8th grade readers at the "meets standards" level usually understand and evaluate the use of a range of literary devices (e.g., word choice, language structure, figurative language, point of view, etc.).

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Progression
Grade 8 Reading, General Statement (IL)

- Below Basic
  - The 8th grade readers at the "academic warning" level have significant difficulty comprehending a variety of types of literary and informational grade-appropriate texts.
- Basic
  - The 8th grade readers who do not meet state standards have difficulty comprehending a variety of types of literary and informational grade-appropriate texts.
- Proficient
  - The 8th grade readers who meet state standards comprehend a variety of types of literary and informational grade-appropriate texts.
- Advanced
  - The 8th grade readers who exceed state standards comprehend a wide variety of types of literary and informational grade-appropriate texts.

Progression:

- have significant difficulty comprehending ➔ have difficulty comprehending ➔ comprehend a variety ➔ comprehend a wide variety

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Progression
Grade 8 Reading, Specific Component

- Below Basic
  - These 8th graders rely too much on their own knowledge and **rarely** use clues in the text to understand **basic** character traits and motives.
- Basic
  - These 8th graders rely too much on their own knowledge and **inconsistently** use clues in the text to understand **basic** character traits and motives.
- Proficient
  - These 8th grade readers **usually** understand the broad meanings of a text such as theme or author's purpose and use clues in the text to understand **basic** character traits and motives.
- Advanced
  - These 8th graders **consistently** use clues in the text to understand **basic and complex** character traits and motives.

Progressions:
- Frequency: rarely ➔ inconsistently ➔ usually ➔ consistently
- Extent: basic ➔ basic ➔ basic➔ basic and complex

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Materials for Panelists

- **Test blueprint**, listing the content standards covered for each subject and grade
- **Item maps**: Secure and released test questions that student at each level can answer correctly
  - Sorted by AL within content strands (reporting categories)
  - Must be signed out and back in!
- **Laptops** to enter draft and, to the extent possible, revised PLDs
- **Coding sheets** to record nominations for released items to use as exemplars.

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Item Maps: Sample Item Header

Item Information

Item Code: CSL10515.062
Passage Title: Fame for Shame
Cognitive Level:
Passage Code: CSL1P062
Standard Code: 7WC1.7
Strand:
Report Category: 1.0 WRITTEN AND ORAL ENGLISH LANGUAGE CONVENTIONS
Standard Set: Spelling
Standard: 1.7 Spelling: spell derivatives correctly by applying the spellings of bases and affixes
Correct Answer: C

		Item Lev	FBB	BB	Bas	Prf	Adv	Status
CSL10515.062	7WC1.7	40	2	37	61	81	92	97	Released

-- Reporting Category/Strand

-- Achievement Level

-- Percent at each achievement level answering correctly

Note: Items grouped by content strand and sorted by achievement level as shown in the footers for each page.

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Sample Question/Interpretation

- Passage Excerpt

  (5) Are some people willing to look ridiculous merely for financeal gain?

- Question *** Released ***

  What is the correct way to spell the underlined word in sentence 5?

  A finansial
  B financal
  C financial
  D financeal

- Possible Summary (for Below Basic)
  - Can spell common words correctly
  - Recognizes correct application of affixes for common words
  - Can correct spelling when errors are pointed out

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Sample Header 2

Item Information

Item Code: CSL11141.127
Passage Title: Puppets
Cognitive Level:
Passage Code: CSL1P127-4
Standard Code: 7WC1.7
Strand:
Report Category: 1.0 WRITTEN AND ORAL ENGLISH LANGUAGE CONVENTIONS
Standard Set: Spelling
Standard: 1.7 Spelling: spell derivatives correctly by applying the spellings of bases and affixes
Correct Answer: B

		Item Lev	FBB	BB	Bas	Prf	Adv	Status
CSL11141.127	7WC1.7	46	4	29	39	53	74	92	Scheduled for Release

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Another Sample Question

- Passage Excerpt
  - The puppets are quite memorible because their shadows are so intricate.
- Question *** Released ***

  Which underlined word is spelled incorrectly?

  A quite
  B memorible
  C their
  D intricate
- Possible Summary (for Proficient)
  - Can spell more complex words correctly
  - Recognizes incorrect application of affixes for common words
  - Recognizes incorrectly spelled words

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Recommended Approach

- Start with a middle [or end] grade in your grade-range.
- Start with the proficient level
  - Compare to questions at the basic level
- Inductive: Work from on one content strand at a time
  - What specific knowledge and skills are needed to answer each of the target items correctly?
  - Write a general statement that summarizes the descriptions for each strand (may be deferred to the end).
- Work down to Basic, then to Below Basic, then up to Advanced.
- Work down to the first grade in the range, and then up to the last grade
- Repeat the process for other content strands/reporting categories

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Descriptor Shells (To be filled in by the whole group)

Subject: Math, Grade 2
Number Sense

Advanced:

The *Advanced* student (always, also, …) …

- xxx

Proficient:

The *Proficient* student (usually, …)

- xxx

Basic:

The *Basic* student (sometimes, …)

- xxx

Below Basic:

The student at Below Basic (rarely, infrequently, …)

- xxx

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Identify Exemplars

- Where feasible, identify one or more "Released" (or "Scheduled for Release") questions at each achievement level.
  - To illustrate the general description for this level
  - To illustrate descriptions of performance in specific reporting categories/strands.

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What's Next?

1. Divide into content-area groups.
2. Check out item maps for your grade range.
3. Practice developing a description of proficient for one grade and content strand .
   - Discuss ideas within and across grade-range groups.
4. Work in groups to draft descriptors for a content strand (across grades).
5. Share and discuss drafts across grade ranges.
6. Complete strand-specific and general descriptors for your grade range; nominator exemplar items as time permits.
   - May split into subgroups if needed and feasible.
7. Discuss overall results across grade ranges (time permitting)

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Appendix D

PLD Approaches: Across-State Comparison

Analysis of Performance Level Descriptors from Other States and NAEP Reading

Shannon Willison and Sheila Schultz

November 15, 2006

Approach A: General Statements Only

Approach Description

States using this approach provide limited and general descriptions of performance (*e.g., "Can comprehend textbooks used at 4th grade level"), which provided context; however no behavioral examples are provided as descriptions of proficiency.

Advantage

- Context provided in general statement

Disadvantage

- Missing additional information to provide details of achievement level expectations

States Involved

Connecticut (3 achievement levels)

Approach B: General Statement plus some Specifics

Approach Description

This approach is characterized by a general description or overall statement to describe the achievement level (e.g., "Demonstrate a general understanding of the reading knowledge and skills expected of all students at this grade level"). In addition to this, the states provide more details into expected behaviors (e.g., "Determine author's purpose and point of view presented"). The behavioral statements for one level do not necessarily build directly from the previous level or show a progression of skill mastery.

Advantages

Context provided in general statement
Behavioral expectations described

Disadvantage

- Behavioral statements do not consistently or directly build to show a skill mastery progression

States Involved

West Virginia (5 achievement levels)
Oklahoma (4 achievement levels)
North Carolina (4 achievement levels)

Differences within Approach

Oklahoma provided many different behavioral examples to elaborate on the initial general statement for each level. West Virginia provided one or two behavioral examples for each level, and none for the lowest level. Because of the lack of detail in West Virginia's lowest level, the difference in achievement levels is somewhat equalized. In addition to minimal behavior statements, North Carolina provided more than one general statement for some levels (e.g., "Demonstrate minimal evidence of the knowledge and skills needed to comprehend many fourth grade level texts" and "Inconsistently apply the skills necessary to be successful readers at the fourth grade level").

Approach C: Multiple Behavioral Statements

Approach Description

This approach is characterized by the exclusive use of multiple behavioral statements to define each achievement level in detail (e.g., "Use language appropriate to the task and intended audience"). Also, these behavioral statements tend to build across levels and show a general progression of skill mastery (e.g., "Reads very few texts," "Reads some diverse texts," and "Reads an extensive variety of texts").

Advantages

- Behavioral expectations described in detail
- Behavioral statements display a progression of skill mastery

Disadvantage

- Limited context provided for achievement levels

States Involved

Louisiana (5 achievement levels)
North Dakota (4 achievement levels)
South Dakota (3 achievement levels)
Ohio (5 achievement levels)

Differences within Approach

North Dakota provided many more behavioral examples (covered more topics) and was more consistent in linking skill/topics across achievement levels. Louisiana did show a skill mastery progression for basic concepts but continued to add additional concepts in the higher-level categories. The lowest achievement level for Louisiana, however, only contained a general performance statement (e.g., "Has not demonstrated the fundamental knowledge and skills needed for the next level of schooling"). Ohio used few and very broad behavioral statements for both grade levels and South Dakota tended to use fewer and broader behaviors for grade 4.

Approach D:

Approach Description

States in this approach, like Approach C, relied on behavioral examples to define each achievement level. Unlike Approach C, however, this approach did not use behavior descriptors that showed a progression of skill mastery across levels. The statements may be related in a limited fashion across achievement level, but not explicitly, and they do not directly build from one level to another.

Advantage

- Behavioral statements provided detailed expectation information

Disadvantages

- Behavioral statements did not show a progression of skill mastery
- Little context was provided for achievement levels

States Involved

Wisconsin (4 achievement levels)
Wyoming (4 achievement levels)
South Carolina (4 achievement levels)

Differences within Approach

Wisconsin and Wyoming are both labeled as four-level systems, however, the lowest category for both states was only described with one general/overall statement and lacked behavioral detail. South Carolina did included some skills (e.g., inference making) that were addressed in multiple achievement levels as did Wyoming for grade 8, however, these linkages were limited in part due to the unbalanced number of descriptors in each level.

Approach E

Approach Description

Approach F is characterized by the use of a general description or overall statement to provide a bearing for each achievement level. In addition, states also provide example behaviors that define expectations at each level. These behavioral statements, for the most part, demonstrate a skill mastery progression across achievement levels.

Advantages

- Behavioral statements provided detailed expectation information
- Behavioral statements demonstrate skill mastery progression
- Context is provided by overall statement

States Involved

**Illinois (4 achievement levels)

Recommendation

We propose using a method similar to Approach E. The ideal approach is characterized by a general statement or overall statement to describe the achievement level and provide context. This statement should then be followed by multiple specific behavioral statements that define each achievement level in terms of expected behaviors. Further, the behavioral statements should build across levels and show a general progression of skill mastery. To accomplish this, there should be an approximately equal number of descriptors in each achievement level. This task might be facilitated by creating a system with fewer achievement level categories (e.g., four).

* All examples were taken from grade 4 PLDs.

**All state PLDs were reviewed for grades 4 and 8 with the exception of Illinois where only grade 8 was reviewed.

4th & 8th Grade Math PLD Approaches: Across-State Comparison

Analysis of Performance Level Descriptors from Other States and NAEP Mathematics

Felicia Gladden and Sheila Schultz

November 15, 2006

Approach A: General Statements Only

Approach Description

- States using this approach provide limited and general descriptions of performance (e.g., "This student scored at the Goal level on the grade 4 Mathematics test."), which provided context; however no behavioral examples are provided as descriptions of proficiency.

Advantage

- Context provided in general statement

Disadvantage

- Missing additional information to provide details of achievement level expectations

States Involved

Connecticut (5 achievement levels)

Differences within Approach

Connecticut's achievement levels have limited statements about the progression of mastered skill.

Connecticut Grade 4				
Far Advanced	*Advanced*	*Proficient*	*Basic*	*Below Basic*
• This student scored at the Advanced level on the grade 4 Mathematics test. • Generally, students who score at this level possess the knowledge and skills necessary to perform tasks and assignments expected of 4th graders independently. • These students demonstrate well-developed conceptual understanding and computational skills as well as an advanced ability to solve complex and abstract mathematical problems.	• This student scored at the Goal level on the grade 4 Mathematics test. • Generally, students who score at this level possess the knowledge and skills necessary to perform the tasks and assignments expected of 4th graders with minimal teacher assistance. • These students demonstrate well-developed computational skills, conceptual understanding, and problem-solving skills.	• This student scored at the Proficient level on the grade 4 Mathematics test. • Generally, students who score at this level demonstrate well-developed computational skills and adequately developed conceptual understanding, but only partially developed problem-solving skills.	• This student scored at the Basic level on the grade 4 Mathematics test. • Generally, students who score at this level demonstrate adequately developed computational skills, but limited conceptual understanding and problem-solving skills.	• This student scored at the Below Basic level on the grade 4 Mathematics test. • Generally, students who score at this level demonstrate some computational skills, but very limited conceptual understanding and problem-solving skills.

Approach B: General and Behavioral Statements without Progression

Approach Description

This approach is characterized by a general description or overall statement to describe the achievement level (e.g., "Students performing at Achievement Level III generally show conceptual understanding, compute accurately, and respond with appropriate answers or procedures"). In addition to this, the states provide more details into expected behaviors. The behavioral statements for one level do not necessarily build directly from the previous level or show a progression of skill mastery.

Advantages

Context provided in general statement
Behavioral expectations described

Disadvantage

- Behavioral statements do not consistently or directly build to show a skill mastery progression

States Involved

Oklahoma (4 achievement levels)

Oklahoma Grade 8			
Advanced	*Proficient*	*Basic*	*Below Basic*
• Students consistently demonstrate a thorough understanding of the knowledge and skills expected of all students at this grade level, which include: number sense; algebraic operations; geometry; data analysis and statistics. • In addition to demonstrating a broad and in-depth understanding and application of all skills at the satisfactory level, students scoring at the advanced level typically: • Use a wide range of strategies to solve problems; • Regularly use various types of reasoning effectively; • Consistently connect one area or idea of mathematics to another; • Communicate mathematical ideas through a variety of representations.	• Students demonstrate a general understanding of the mathematics knowledge, skills, and processes expected of all students at this grade level. Students scoring in the satisfactory range typically will: • Compare, order, and use different forms of positive and negative rational numbers to solve problems; • Solve single and multi-step algebraic equations and inequalities; • Develop, select and apply appropriate formulas for given situations; • Classify solid figures and apply the concepts of surface area and volume real-world settings; • Use ratio and proportion to solve problems involving similar geometric figures; • Determine probabilities of uncertain events happening; and • Analyze samples and select and apply appropriate charts and graphs to represent collected data.	• Students demonstrate a partial understanding of the mathematics knowledge, skills, and processes expected of all students at this grade level. • Students scoring at the limited knowledge level have difficulty and are inconsistent in applying the general knowledge and mathematical process skills necessary to solve problems effectively and reason mathematically.	• Students do not demonstrate at least a limited knowledge level of the skills expected of all students at this grade level. • Students scoring at the unsatisfactory level should be given comprehensive mathematics instruction.

Approach C: Behavioral Statements Only with Progression

Approach Description

This approach is characterized by the exclusive use of multiple behavioral statements to define each achievement level in detail (e.g., "Use language appropriate to the task and intended audience"). Also, these behavioral statements tend to build across levels and show a general progression of skill mastery (e.g., "Reads very few texts," "Reads some diverse texts," and "Reads an extensive variety of texts").

Advantages

- Behavioral expectations described in detail
- Behavioral statements display a progression of skill mastery

Disadvantage

- Limited context provided for achievement levels

States Involved

North Dakota- Number & Operations, Measurement, Algebra, Geometry & Spatial Sense, and Data Analysis & Probability (4 achievement levels)[4]

South Dakota- Number Sense, Measurement, Algebra, Geometry, and Statistics & Probability. (3 achievement levels)

Wisconsin (4 achievement levels)

Differences within Approach

Wisconsin has limited progression between each achievement level. Out of all the states, in this category, South Dakota is the worst example. South Dakota's behavioral statements are followed by a few general statements regarding skill mastery.

North Dakota Grade 4- Data Analysis & Probability

Advanced	*Proficient*	*Basic*	*Below Basic*
• Students determine a representative sample group to survey with ease. • Students collect, record, organize and display data in line graphs and circle graphs with no errors. • Students read and interpret data with no errors and generate insightful questions from data displayed in graphs. • Students use computers and spread sheets to organize and display data with no errors.	• Students determine a representative sample group to survey with minimal difficulty. • Students collect, record, organize and display data in line graphs and circle graphs with no significant errors. • Students read and interpret data with no significant errors and generate relevant questions from data displayed in graphs. • Students use computers and spread sheets to organize and display data with no significant errors.	• Students determine a representative sample group to survey with some difficulty. • Students collect, record, organize and display data in line graphs and circle graphs with a few significant errors. • Students read and interpret data with a few significant errors and generate obvious questions from data displayed in graphs. • Students use computers and spread sheets to organize and display data with a few significant errors.	• Students determine a representative sample group to survey with great difficulty. • Students collect, record, organize and display data in line graphs and circle graphs with many significant errors. • Students read and interpret data with many significant errors and generate inappropriate questions from data displayed in graphs. • Students use computers and spread sheets to organize and display data with many significant errors.

[4] These are the various ways that some states split their 4th and 8th grade math PLDs.

North Dakota Grade 4- Data Analysis & Probability			
Advanced	*Proficient*	*Basic*	*Below Basic*
• Students use number lines and coordinate graphs to represent data with no errors. • Students conduct simple probability experiments with no errors. • Students determine or calculate the mode, mean/ average, and range for a data set with no errors. • Students make predictions and draw conclusions from simple probability experiments with no errors.	• Students use number lines and coordinate graphs to represent data with no significant errors. • Students conduct simple probability experiments with no significant errors. • Students determine or calculate the mode, mean/ average, and range for a data set with no significant errors. • Students make predictions and draw conclusions from simple probability experiments with no significant errors.	• Students use number lines and coordinate graphs to represent data with a few significant errors. • Students conduct simple probability experiments with a few significant errors. • Students determine or calculate the mode, mean/ average, and range for a data set with a few significant errors. • Students make predictions and draw conclusions from simple probability experiments with a few significant errors.	• Students use number lines and coordinate graphs to represent data with many significant errors. • Students conduct simple probability experiments with many significant errors. • Students determine or calculate the mode, mean/ average, and range for a data set with many significant errors. • Students make predictions and draw conclusions from simple probability experiments with many significant errors.

Approach D: Behavior Statements Only without Progression

Approach Description

States in this approach, like Approach C, relied on behavioral examples to define each achievement level. Unlike Approach C, however, this approach did not use behavior descriptors that showed a progression of skill mastery across levels. The statements may be related in a limited fashion across achievement level, but not explicitly, and they do not directly build from one level to another.

Advantage

- Behavioral statements provided detailed expectation information

Disadvantages

- Behavioral statements did not show a progression of skill mastery
- Little context was provided for achievement levels

States Involved

South Carolina (4 achievement levels)

Differences within Approach

South Carolina's highest two fourth grade levels (Advanced and Proficient) have the exact same descriptions.

South Carolina Grade 8			
Advanced	*Proficient*	*Basic*	*Below Basic*
• Solve quadratic equations. • Use spatial sense. • Visualize and set up mathematical relationships without the aid of a visual prompt. • Use number sense and geometric awareness. • Use estimation when solving more complex problems. • Determine the reasonableness of their answer.	• Interpret and translate pictorial representations of mathematical concepts. • Work with decimals, fractions, and percentages. • Conceptualize the relationships among decimals, fractions, and percentages. • Understand relationships between variables. • Determine if an answer is reasonable. • Translate language into numerical concepts. • Understand algebraic functions.	• Solve minimally complex problems dealing with area and perimeter changes. • Use the Pythagorean theorem. • Evaluate expressions involving more than one variable with integer substitutions.	• Solve simple two-step equations that use whole numbers. • Simplify expressions by substituting one integer. • Read simple graphs and perform simple computations.

Approach E: General and Behavioral Statements with Progression

Approach Description

Approach E is characterized by the use of a general description or overall statement to provide a bearing for each achievement level. In addition, states also provide example behaviors that define expectations at each level. These behavioral statements, for the most part, demonstrate a skill mastery progression across achievement levels.

Advantages

- Behavioral statements provided detailed expectation information
- Behavioral statements demonstrate skill mastery progression
- Context is provided by overall statement

States Involved

Illinois 5th grade- Number Sense, Measurement, Algebra, Geometry, and Probability & Statistics (4 achievement levels)
**Louisiana (5 achievement levels)[5]
**Michigan (3 achievement levels)
**North Carolina (4 achievement levels)
Ohio (5 achievement levels)
West Virginia- Number & Operations, Measurement, Algebra, Geometry, and Data Analysis (5 achievement levels)
Wyoming- Number Operation & Concepts, Measurement, Algebra, Geometry, and Data Analysis & Statistics (4 achievement levels)

[5] The states with "**" are the best examples of PLDs.

Differences within Approach

Ohio and West Virginia have limited progression between achievement levels.

Louisiana Grade 4				
Advanced	*Proficient*	*Basic*	*Below Basic*	*Far Below Basic*
• Fourth grade students performing at the advanced level consistently apply integrated procedural knowledge and conceptual understanding to problem solving in the six Louisiana mathematics content strands3. • They readily see multiple solutions/strategies (including non-routine ones) to apply to problems. • Fourth grade students performing at this level • Solve complex and non-routine real-world problems in all the Louisiana mathematics content strands; • Display mastery in the use of four-function calculators, rulers, and geometric shapes; • Draw logical conclusions and justify answers and solution processes by explaining the procedures and the rationale for using them; • Go beyond the obvious in their interpretations; and • Are able to communicate their thoughts clearly and concisely.	• Fourth grade students performing at the mastery level consistently apply integrated procedural knowledge and conceptual understanding to problem solving in the six Louisiana mathematics content strands. • Fourth grade students performing at this level use whole numbers to estimate, compute, and determine whether results are reasonable; • Have a conceptual understanding of fractions, decimals, and percents and their relationship; • Are able to solve real - world problems in all the Louisiana mathematics content strands; • Accurately use four-function calculators, rulers, and geometric shapes appropriately; • Employ problem-solving strategies such as identifying and using appropriate information; an • Organize and present written solutions both with supporting information and explanations of how they were achieved.	• Fourth grade students performing at the basic level show some evidence of understanding the mathematical concepts and procedures in the six Louisiana mathematics content strands. • Fourth grade students performing at this level estimate and use basic facts to perform • Simple computations with whole numbers; • Show some understanding of fractions, decimals, and percents and their relationships; • Solve some simple real-world problems in all the Louisiana mathematics content strands; • Use—with some degree of accuracy—four-function calculators, rulers, and geometric shapes; and • Provide written responses that are often minimal and presented without supporting information.	• Fourth grade students performing at the approaching basic level show minimal evidence of understanding the math concepts and procedures in the six Louisiana mathematics content strands. • Fourth grade students performing at this level. • Use basic facts to perform simple computations with whole numbers; • Recognize fractions, decimals, and percents; • Exhibit difficulty applying conceptual knowledge in solving real-world problems; • Use—with some degree of accuracy—four function calculators, rulers, and geometric shapes; and • Provide minimal or non-existent written responses	• A student at this level has not demonstrated the fundamental knowledge and skills needed for the next level of schooling.

Use of Negative Statements

In the Below Basic achievement level, several states began with negative general PLD statements about what students cannot do. After these general statements, states then list the various math concepts and operations that students can perform (e.g., North Carolina Grade 8:
"students compare, order, and compute with rational numbers; students use the Pythagorean theorem and solve problems with similar and congruent figures; and they identify 3-D figures and calculate surface area and volume"). Below are states that give a detail list of students mastered skills in the below basic achievement level.

- Illinois 5th grade
- Louisiana
- North Carolina
- North Dakota
- Oklahoma
- South Carolina

Recommendation

We propose using a method similar to Approach E. The ideal approach is characterized by a general statement or overall statement to describe the achievement level and provide context. This statement should then be followed by multiple specific behavioral statements that define each achievement level in terms of expected behaviors. Further, the behavioral statements should build across levels and show a general progression of skill mastery. To accomplish this, there should be an approximately equal number of descriptors in each achievement level. This task might be facilitated by creating a system with fewer achievement level categories (e.g., four).

* All approach description examples were taken from grade 4 and 8 PLDs.
**All state PLDs were reviewed for grades 4 and 8.