Assessment

Assessment plays a crucial role in delivering high quality instruction and ensuring the learning of all students. In order for assessment to be effective, teachers need to have clear reasons for why they are using the assessment tools they are using. That is, assessment must have a clear purpose in instruction: to support and enhance student learning. Assessment activities should be embedded in instruction and provide opportunities for informative feedback to both students and teachers. A variety of assessment strategies need to be employed as learning is multidimensional and cannot be adequately measured by a single instrument (Suurtamm, Koch, and Arden 2010, 400).

Assessment provides students with frequent feedback on their performance, teachers with diagnostic tools for gauging students’ depth of understanding, parents with information about their children’s performance in the context of program goals, and administrators with a means for measuring student achievement. Assessment should be a major component of the learning process. As students help identify goals for lessons or investigations, they gain greater awareness of what they need to learn and how they will demonstrate that learning. Engaging students in this kind of goal-setting can help them reflect on their own work, understand the standards to which they are held accountable, and take ownership of their learning.

According to the National Council of Teachers of Mathematics (NCTM), “Assessment is the process of gathering evidence about a student’s knowledge of, ability to use, and disposition towards mathematics and of making inferences from the evidence for a variety purposes” (NCTM 1995, 3). The NCTM suggests four stages of developing assessment and analyzing results that interact and reinforce each other:

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The purpose of this chapter is to elucidate some of the key ideas of assessment and provide examples of how to implement them in practice.

**Purposes of Assessment**

As noted earlier, the purpose of assessment should be to support and enhance student learning. A particular assessment may be designed to support the students in an entire school or district, the students in a single classroom, or individual students. In any case, and regardless of the form, evidence gathered from the assessment should be used to inform instructional decisions. For example, a teacher may use a mathematics portfolio project to measure students’ long-term learning and understanding of connections of big ideas in a unit; and then use inferences derived from the results to decide how to fill in apparent gaps in student understanding before a major summative test. A department or school may use interim assessments (sometimes known as benchmark assessments) to track the progress of all fifth grade students in the district and then identify schools or classrooms that seem to need the most support in improving student learning. A district may collect statewide testing data and use it to identify schools or student populations of greatest need and make targeted professional development and support available for those schools or students. If an assessment is
being implemented and a clear goal or use for the results of the assessment is not
apparent, then the assessment practice in question should be reexamined and
resources potentially redirected to creating more purposeful assessments or eliminating
them altogether.

At the classroom, department, and possibly school level, the purpose of assessment of
individual students should be more than simply measuring “what students know.”
Traditional paper-and-pencil and “high-stakes” tests have prompted teachers to
emphasize basic, factual information and to provide few opportunities for students to
learn how to apply knowledge (Fuchs and others 1999, 611). Assessment in
mathematics must go beyond focusing on how well a student uses a memorized
algorithm or procedure and must also elicit, assess, and respond to students’
mathematical understandings (NCTM 1995; Suurtamm, Koch, and Arden 1999, 401).
This change is essential in light of the Standards for Mathematical Practice, which
require students to persevere through solving difficult problems, communicate
mathematical thinking, use tools and model with mathematics, use quantities
appropriately and attend to precision, and transfer patterns in reasoning and structure to
new problems. The focus of assessment must then shift towards assessing content
knowledge and practices as opposed to simply assessing content (“what students know
how to do”). Assessments should ask for variety in what students produce (for
example, answers and solutions, arguments and explanations, diagrams and
mathematical models) to help identify both mathematics content and mathematical
practice learning.

At larger scales, assessments can track progress towards long-term learning goals for
groups of students or for schools receiving instructional support. Large-scale
assessments can help indicate the effectiveness of a professional development
program or new instructional materials. Data from statewide summative assessments
can be used to indicate schools that are performing well within an area or district and
those where resources can be provided to support improvements in instruction. At the

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school and district level, administrators should carefully measure the impact of chosen
assessment practices on the classroom; if teachers are constantly under pressure to
assess their students, then instruction will often reflect this and the phenomenon of
“teaching to the test” can emerge. Both anecdotal and research evidence show that the
undesirable outcome of teaching to the test can and does occur (Fuchs and others 1999).

Forms of Assessment
Current mathematics education literature recognizes two major forms of assessment
practices: formative and summative. The distinction between these types of
assessment is based on how they are used and many forms of assessment can be
used both formatively and summatively. In addition, diagnostic assessments are used
frequently as tools for placing students into courses or identifying which students could
benefit from an intervention program.

Formative Assessment: Formative assessment is a systematic process to
continuously gather evidence and provide feedback about learning while instruction is
under way. Formative assessment can span over a fifteen-minute individual time with
one student, over a weeklong unit, or over a school year. The key feature of formative
assessment is that action is taken to close a perceived gap in students’ learning based
on evidence elicited by the assessment practice. As Paul Black and Dylan Wiliam state
in their seminal work on the topic: “assessment becomes ‘formative assessment’ when
the evidence is actually used to adapt the teaching work to meet the needs [of
students]” (Black and Wiliam 2001, 2). If an assessment tool is used to gather
information and there is no responsive change in instruction to address student
misunderstandings, then the tool is not being used formatively. The Four Stages of
Assessment come into play with formative assessment, as teachers are often involved
in the creation of the assessment tool, the alignment to specific goals, the administration
of the tool, and reflection on the results, as illustrated in Figure 1.
The primary purpose of formative assessment is to improve learning, not merely to audit it. It is assessment for learning rather than assessment of learning. Formative assessment is both an "instructional tool" that teachers and their students "use while learning is occurring" and "an accountability tool to determine if learning has occurred" (National Education Association [NEA] 2003, 3). In other words, to be "formative," assessments must inform the decisions that teachers and their students make minute by minute in the classroom. For example, a mid-chapter quiz is usually considered a formative assessment. However, if the result of the quiz has only been recorded in a grade book to serve the purpose of accountability or of certifying competence, it cannot be considered a formative assessment.

The table below explains some of the key components of formative assessment in more detail.

<table>
<thead>
<tr>
<th>The Interrelated Dimensions of Formative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Shared learning targets and criteria for success:</strong> A vision of the end point makes the journey possible. Students who have a clear picture of the learning goals and of the criteria for success are likely to have a sense of what they can and should do to make their work measure up to those criteria and goals. They also have some sense of control over their work and are poised to be strategic self-regulators.</td>
</tr>
<tr>
<td><strong>Feedback that promotes further learning:</strong> The power of formative assessment lies in its double-barreled approach, addressing both cognitive and motivational factors. To be effective, feedback comments should identify what has been done well and what still needs improvement and give guidance on how to make that improvement. Opportunities for students to respond to comments should be planned as part of the overall learning process. Feedback to any pupil should be about the particular qualities of his or her work and should avoid comparisons with other pupils.</td>
</tr>
</tbody>
</table>

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### Self-assessment and Peer Assessment:

Many successful innovations have developed self- and peer-assessment by pupils as ways of enhancing formative assessment. The main problem for self-assessment is not the problem of reliability and trustworthiness; in fact, it is found that pupils are generally honest and reliable in assessing both themselves and one another, and can be too hard on themselves as often as they are too kind. The main problem is different—it is that pupils can only assess themselves when they have a sufficiently clear picture of the targets that their learning is meant to attain. When pupils do acquire such an overview, they then become more committed and more effective as learners. Their own assessments become an object of discussion with their teachers and with one another. This promotes learning.

As teachers and students actively and intentionally engage in learning, the individual elements unite in a flurry of cognitive activity, working together and depending on each other. Their power comes from their combined effort.

(Black and others 2004, 8-21,

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Not every formative assessment tool is appropriate for every student, goal, or topic area, and so teachers will need to differentiate their formative assessment practice based on their experience with using the tool with their students. Furthermore, formative assessment practices do not necessarily exist in isolation from one another; many are often built into the lesson of the day or the weekly unit.

### Summative Assessment:

Summative assessment refers to the assessment of learning at a particular time point and is meant to summarize a learner's development. Summative assessments frequently come in the form of chapter or unit tests, weekly quizzes, or end-of-term tests. In contrast to formative assessment, summative assessment represents the state of a student's skills and knowledge at a given point in time, and is meant to assess the effectiveness of instruction and a student's learning progress. Such assessments are not necessarily used to inform instruction. Summative assessment can be used to measure the effectiveness of an instructional program.

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While both summative assessment and formative assessment are essential, the crucial distinction is between assessments to determine status of learning and assessment to promote greater learning.

### Characteristics of Formative and Summative Assessment

<table>
<thead>
<tr>
<th>Formative Assessment</th>
<th>Summative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purpose:</strong> To improve learning and achievement</td>
<td><strong>Purpose:</strong> To measure or audit attainment</td>
</tr>
<tr>
<td>Carried out while learning is in progress—day-to-day, minute-by-minute.</td>
<td>Carried out from time to time to create snapshots of what has happened.</td>
</tr>
<tr>
<td>Focused on the learning process and the learning progress.</td>
<td>Focused on the products of learning.</td>
</tr>
<tr>
<td>Viewed as an integral part of the teaching-learning process.</td>
<td>Viewed as something separate, an activity performed after the teaching-learning cycle.</td>
</tr>
<tr>
<td>Collaborative—Teachers and students know where they are headed, understand the learning needs, and use assessment information as feedback to guide and adapt what they do to meet those needs.</td>
<td>Teacher directed—Teachers assign what the students must do and then evaluate how well they complete the assignment.</td>
</tr>
<tr>
<td>Fluid—An ongoing process influenced by student need and teacher feedback.</td>
<td>Rigid—An unchanging measure of what the student achieved.</td>
</tr>
<tr>
<td>Teachers and students adopt the role of intentional learners.</td>
<td>Teachers adopt the role of auditors and students assume the role of the audited.</td>
</tr>
<tr>
<td>Teachers and students use the evidence they gather to make adjustments for continuous improvement.</td>
<td>Teachers use the results to make final “success or failure” decisions about a relatively fixed set of instructional activities.</td>
</tr>
</tbody>
</table>

(Moss and Brookhart 2009)

### Assessment Tools

The list below offers several assessment tools and strategies, many of which can be used both formatively and summatively. This list is by no means exhaustive. Furthermore, the various tools listed can be administered in a formal way, such as with a checklist of skills for student observation that is filled out for every student throughout.

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a week, or quite informally, such as with a “ticket-out-the-door” mini-assessment question that is used as a gauge of student understanding of that day’s or week’s major concept.

- **Student Observation** refers to in-classroom observation of students working on mathematics tasks, either independently or in groups. While many teachers already do this, walking around the room, actively listening to students, asking questions, directing discourse, and helping them where needed, they may not see this as a form of assessment. The instantaneous feedback to students about where to go next, what question they may want to ask themselves to gain insight into a problem, or simply correcting computational errors, results in this practice being a form of formative assessment. Teachers may focus their observations using checklists based on specific skills and concepts.

- **Graphic Organizers** such as flow charts and concept maps can be used to assess students’ understanding of mathematical concepts and connections between ideas. For instance, a teacher may post several terms in the classroom and ask students to define the terms in their own words and connect each term to as many others they can, indicating so with an arrow and a description of why the terms are connected. Teachers can ask students to provide examples of terms or concepts, to explain how and why a certain algorithm or skill works, or describe situations in which a given concept applies.

- **Student Interviews** can help teachers gain insight into student thinking and to guide them in providing differentiated instruction. When teachers formally or informally discuss mathematics with students, checking for understanding of concepts or procedures, they are potentially gaining a much better understanding of a student’s current ability than a paper-and-pencil test can tell them. Teachers could use such interviews as a means for assessing student progress on mastering a given standard, and the results of interviews can be factored into grading policies.

- **Journals and Learning Logs** are tools in which students do mathematical writing that serves to illuminate their current understandings. For example, a teacher may...
provide each student with a journal that is kept in the classroom, which is then used for students to solve an “exit problem” of the day. Or students may be asked to explain what they learned that given day or what they think the major idea of the lesson was. Such journals have a variety of uses. Teachers should not feel required to grade everything in the math journal; in fact, this may diminish its use as students feel they need to write a “correct response.” Instead, teachers can simply read all or some of their students’ journals to get feedback on student understanding.

- **Mathematics Portfolios** are a way to assess students’ understanding of big ideas, connections between ideas, procedural knowledge, and the Standards for Mathematical Practice. A project can be explored in groups over several class periods at the end of which a “portfolio” of all the students’ relevant work is included. Given the nature of the CA CCSSM and the emphasis on mathematical practices, tools such as these will be necessary to assess students’ development as problem-solvers and can be used to document students’ learning over time.

- **Self- and Peer-Evaluations** give students ownership of their learning and provide teachers with insight into students’ recognition of their own progress.

- **Short Tests and Quizzes**. Used to inform instruction, small-scale tests and quizzes can be used as formative assessments when seen as part of a unit or chapter. Such tests and quizzes can involve several different problem types and may or may not necessarily contribute to a student’s overall course grade. However, if the results of such tools are not used to inform future instruction, then they are not being used formatively.

- **Performance Tasks** consist of problems or scenarios that demand students engage in thinking about a problem, encourage them to justify their thinking, and often require students to engage with other students. Administered to individual students or to groups, performance tasks are often complex problem solving activities that require students to apply prior knowledge in a given situation or to extend current knowledge in new directions. The term “performance task” is a broad one and refers to in-classroom tasks or even to assessment items [see Smarter Balanced

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Assessments]. Teachers may monitor students’ progress on the task and give them immediate feedback as part of a larger formative assessment program.

The CA CCSSM require students to acquire a deeper conceptual understanding of mathematics. The introduction of the Standards for Mathematical Practice increases the complexity of gathering evidence to determine student proficiency. Oftentimes referred to as projects, oral presentations, and/or written responses to open-ended real-world problems, performance tasks require a student to demonstrate mathematical learning across several content and practice standards that are considered prerequisite skills for college and career readiness (Measured Progress/ETS Collaborative2012, 31). Various approaches can be utilized to determine student proficiency through performance tasks, including rating scales such as rubrics, checklists, and anecdotal records (Burden and Byrd 2009).

**On Using Rubrics:** A rubric is a type of rating scale that allows the teacher to determine mathematical learning along a continuum. By utilizing rubrics, teachers can quantify student learning while focusing upon the pre-determined key components of the performance task. Popham (2010) suggests that scoring rubrics have three key features: 1) evaluative criteria that indicate the quality of the student’s response (usually three or four); 2) descriptions of the qualitative differences in student performance for the evaluative criteria; and 3) whether the performance task will be scored holistically (e.g., a single overall score) or analytically (e.g., points are awarded for each of the performance indicators to provide students with more specific feedback).

Van de Walle (2005) provides an example of a generic four-point rubric (below) that can be used to first sort student responses into high – low categories before assigning a point on a scale. He suggests that sharing the rubric ahead of time with students “clearly conveys what is valued” in completing the performance task (Van de Walle 2005, 84).

<table>
<thead>
<tr>
<th>Rubric Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Excellent</td>
</tr>
<tr>
<td>3</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Fair</td>
</tr>
<tr>
<td>1</td>
<td>Poor</td>
</tr>
</tbody>
</table>

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### Scoring with a Four-Point Rubric

<table>
<thead>
<tr>
<th>Got It</th>
<th>Not Yet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence shows that the student essentially has the target concept or idea.</td>
<td>Student shows evidence of major misunderstanding, incorrect concept or procedure, or failure to engage in task.</td>
</tr>
<tr>
<td><strong>4</strong> Excellent: Full Accomplishment</td>
<td><strong>2</strong> Marginal: Partial Accomplishment</td>
</tr>
<tr>
<td>Strategy and execution meet the content, process, and qualitative demands of the task. Communication is judged by effectiveness, not length. May have minor errors.</td>
<td>Part of the task is accomplished, but there is a lack of evidence of understanding or evidence of not understanding. Direct input or further teaching is required.</td>
</tr>
<tr>
<td><strong>3</strong> Proficient: Substantial Accomplishment</td>
<td><strong>1</strong> Unsatisfactory: Little Accomplishment</td>
</tr>
<tr>
<td>Could work to full accomplishment with minimal feedback. Errors are minor, so teacher is confident that understanding is adequate to accomplish the objective.</td>
<td>The task is attempted and some mathematical effort is made. There may be fragments of accomplishment but little or no success.</td>
</tr>
</tbody>
</table>

The Smarter Balanced Assessment Consortium provides examples of rubrics that are based upon the CCSSM, such as the following sixth grade problem and scoring rubric, that demonstrate student learning for standard 6.EE.5, and mathematical practice standards 1, 2, and 4.
**Part A**

Ana is saving to buy a bicycle that costs $135. She has saved $98 and wants to know how much more money she needs to buy the bicycle.

The equation \(135 = x + 98\) models this situation, where \(x\) represents the additional amount of money Ana needs to buy the bicycle.

- When substituting for \(x\), which value(s), if any, from the set \(\{0, 37, 08, 135, 233\}\) will make the equation true?
- Explain what this means in terms of the amount of money needed and the cost of the bicycle.

**Scoring Rubric:** Responses to this item will receive 0-3 points, based on the following:

**3 points:** The student shows a thorough understanding of equations and inequalities in a contextual scenario, as well as a thorough understanding of substituting values into equations and inequalities to verify whether or not they satisfy the equation or inequality. The student offers a correct interpretation of the equality and the inequality in the correct context of the problem. The student correctly states that 37 will satisfy the equation and that the values from 53 to 250 will satisfy the inequality.

**2 points:** The students show a thorough understanding of substituting values into equations and inequalities to verify whether or not they satisfy the equation or inequality but limited understanding of equations or inequalities in a contextual scenario. The student correctly states that 37 will satisfy the equation and that the values from 53 to 250 will satisfy the inequality, but the student offers an incorrect interpretation of the equality or the inequality in the context of the problem.

**1 point:** The student shows a limited understanding of substituting values into equations and inequalities to verify whether or not they satisfy the equation or inequality and a limited understanding of equations and inequalities in a contextual scenario. The student correctly states that 37 will satisfy the equation, does not state that the values from 53 to 250 will satisfy the inequality, and offers incorrect interpretations of the equality and the inequality in the context of the problem. OR The student correctly states that the values from 53 to 250 will satisfy the inequality, does not state that 37 satisfies the equation, and offers incorrect interpretations of the equality and the inequality in the context of the problem.

**0 points:** The student shows little or no understanding of equations and inequalities in a contextual scenario and little or no understanding of substituting values into equations and inequalities to verify whether or not they satisfy the equation or inequality. The student offers incorrect interpretations of the equality and the inequality in the context of the problem, does not state that 37 satisfies the equation, and does not

**Part B**

Ana considered buying the $135 bicycle, but then she decided to shop for a different bicycle. She knows the other bicycle she likes will cost more than $150.

This situation can be modeled by the following inequality.

\[ x + 98 > 150 \]

- Which values, if any, from –250 to 250 will make the inequality true? If more than one value makes the inequality true, identify the least and greatest values that make the inequality true.
- Explain what this means in terms of the amount of money needed and the cost of the bicycle.

**Sample Top-Score Response:**

**Part A**

The only value in the set given that makes the equation true is 37.

This means that Ana will need exactly $37 more to buy the bicycle.

**Part B**

The values from 53 to 250 will make the inequality true.

This means that Ana will need from $53 to $250 to buy the bicycle.
bicycle. state the values from 53 to 250 will satisfy the equation.
• **Unit or Chapter Assessments** measure student learning of the content and skills in a unit or chapter. Such tests should include items that are linked to specific learning goals, be connected to the CA CCSSM, and pay attention to the Standards for Mathematical Practice. To effectively assess such goals, such tests should include various types of tasks, including multiple choice, selected response (possibly more than one response correct), short answer, and short performance tasks (see *Performance Tasks* above).

• **Diagnostic assessments** are often broad in scope, containing a range of topics that are prerequisites for success in a given unit, class, or grade level. Such assessments can also identify specific areas of difficulty for students that need to be addressed through intervention and can inform the placement of students into intervention programs.

• **Interim Assessments** can be administered on a relatively frequent basis and are used to measure the incremental learning of students throughout a given period of time. These tests identify specific performance standards students have or have not achieved and often reveal possible reasons why students have not yet progressed in certain areas. Interim assessments are frequently used as formative assessments as well.

• **State or National Assessments** are large-scale assessments used to gather information about the progress of academic systems and bodies of students as a whole. More information about the State of California’s assessment system is forthcoming. See the section below on the *Smarter Balanced Assessment Consortium’s* (Smarter Balanced) tests.

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### A Note On Grading

While a classroom grading policy is ultimately a local decision, a message is presented here about the overall purpose and direction of a grading policy. In *The Last Frontier: Tackling the Grading Dilemma*, from “Ahead of the Curve: The Power of Assessment to Transform Teaching and Learning,” author Ken O’Connor provides several guidelines for designing grading policies, summarized below.

- Rather than “calculating” one final grade based only on assessment methods (quizzes, tests, homework, etc.), grades should be based on and grades should be provided for specific performance standards linked to the CA CCSSM.
- O’Connor writes that individual achievement should be the primary attribute included in a student’s grade. Other aspects such as effort and participation can be graded but should not impact measures of achievement.
- Grading should be flexible enough to provide for sampling student performance, rather than including everything in a grade, and quality assessments with proper recording of student achievement should determine that performance.
- Finally, teachers should discuss with and involve students in assessment throughout the learning process.

### A Note on Homework

As with grading policies, whether and how to use homework as an instructional tool and assessment tool is a local decision. However, if homework is used in a course, it should have clear standards-based goals that students can achieve on their own. It should promote student ownership of their learning, instill a sense of competence, and it should be clear and accessible to students. Some reasons for assigning homework include prelearning of concepts, checking for understanding of classroom work, practice of skills and procedures, and processing of concepts developed in class. Appropriate homework feedback can serve a formative purpose if it provides students and teacher with direction for learning. For another example, teachers may indicate to students that they should work on problems 1 through 5 first; if these problems are not difficult then students can move on. However if a student has difficulty with these first five problems, then that should serve as a warning sign that the student needs to see the teacher for further instruction. Regardless,
teachers and administrators should consider a clear purpose for homework as a means for assessment and learning. (Van de Walle 2005)

**Smarter Balanced Assessment Consortium** (Smarter Balanced), **Common Core Assessments**. California’s participation in the Smarter Balanced Assessment Consortium has resulted in a statewide assessment program designed to measure students’ and schools’ progress towards meeting the goals of the CA CCSSM at Grades 3-8 and Grade 11. Smarter Balanced assessments will require students to think critically, solve problems, and show a greater depth of knowledge, and will assess the following four claims:

<table>
<thead>
<tr>
<th>Claim #1</th>
<th>Concepts &amp; Procedures: Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency. This claim addresses procedural skills and the conceptual understanding on which developing skills depend. It is important to assess how aware students are of how concepts link together and why mathematical procedures work the way they do. Central to understanding this claim is making the connection to these elements of the mathematical practices as stated in the CA CCSSM: MP.5, MP.6, MP.7, and MP.8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claim #2</td>
<td>Problem Solving: Students can solve a range of complex, well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies. Assessment items and tasks focused on Claim 2 include problems in pure mathematics and problems set in context. Problems are presented as items and tasks that are well-posed (that is, problem formulation is not necessary) and for which a solution path is not immediately obvious. These problems require students to construct their own solution pathway rather than follow a provided one. Such problems will therefore be unstructured, and students will need to select appropriate conceptual and physical tools to use.</td>
</tr>
</tbody>
</table>

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Claim #3  Communicating Reasoning: Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

Claim 3 refers to a recurring theme in the CA CCSSM content and practice standards—the ability to construct and present a clear, logical, convincing argument. For older students, this may take the form of a rigorous, deductive proof based on clearly stated axioms. For younger students, this will involve more informal justifications. Assessment tasks that address this claim will typically present a claim and ask students to provide, for example, a justification or counterexample.

Claim #4  Modeling and Data Analysis: Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

Modeling is the bridge across the “school math”/”real world” divide that has been missing from many mathematics curricula and assessments. It is the twin of mathematical literacy, the focus of the Programme for International Student Assessment (PISA) international comparison tests in mathematics. CA CCSSM features modeling as both a mathematical practice at all grades and a content focus in higher mathematics.

Some of the features of the Smarter Balanced assessment program are listed below.

More information about the assessment program can be found at smarterbalanced.org.

- **Computer-Based Testing.** Schools with the capability to do so will administer tests electronically to every student in their purview. Computer-based testing will allow for smoother test administration, more rapid reporting of results, and the ability to utilize computer-adaptive testing.

- **Computer Adaptive Testing.** The Smarter Balanced assessments make use of a system that monitors a student’s progress while taking the assessment and gives them harder or easier problems depending on the student’s performance on the current item. In this way, the computer system can adjust to higher and lower
performing students to give more accurate results regarding their mathematics performance.

- **Varied Items.** The Smarter Balanced tests allow for several types of items intended to measure different learning outcomes. For instance, a selected response item may have two correct choices out of four; a student only selecting one of those correct items would indicate a different understanding of a concept than a student who selected both of the correct responses. Constructed-response questions will be featured, as well as performance assessment tasks (which include extended-response questions) that will measure students’ abilities to solve problems and use mathematics in context, thereby measuring students’ progress towards employing the mathematical practice standards in addition to demonstrating knowledge of mathematics content. Finally, the assessments will feature technology-enhanced tasks that will aim to provide evidence of mathematical practices where selected and constructed response questions may not.