

Smarter Balanced Assessment System: Connecting the Mathematics Claims to Classroom Instruction Grades K-5



Connecticut State Department of Education
Fall 2014



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Note: Each participant will receive a copy of the K-12 Mathematics *Common Core Standards* flip book as well as the *Principles to Actions* e-book as long as the assurance form is completed.

Learning Targets

- I understand the types of learning activities and tasks that will support student mastery of the Standards for Mathematics Content and develop student expertise with the Standards for Mathematical Practice.
- I understand how my classroom instruction supports student learning.
- I understand how classroom activities and tasks align with the summative assessment.



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These learning targets should be posted on chart paper for the duration of the workshop.

Unlike instructional objectives, which are about instruction, derived from content standards, written in teacher language, and used to guide teaching during a lesson or across a series of lessons, **learning targets** frame a lesson from the student point of view.

A learning target helps students grasp the lesson's purpose--why it is crucial to learn this chunk of information, on this day, and in this way.

With this in mind, the three learning targets stated on this slide inform participants of the learning goals based on the scope of this half-day presentation.

Facilitator, please note that the types of activities found within this presentation support different curricular needs, whether it be developing understanding of the mathematics **content or developing expertise with the mathematical practices**. They are not stand alone activities that should be done just to check off a standard, but should be a part of a larger unit of instruction.

Success Criteria

- I can explain how the Connecticut Core Standards (CCS) for Mathematics connect to the Smarter Balanced Claims.
- I can meet the scope of the Content Standards and Practice Standards through best practices and by incorporating a variety of strategies and activities in my instruction.



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When presenting this slide, inform participants that these two bullet point frame the scope of learning for this presentation. The success criteria are the Learning Targets written in a student-friendly way, often are posted beginning with the words "I CAN..." indicators that the teacher and the students can use to check their learning against as they work to meet the learning goals. After the completion of a lesson (or in this case, the presentation), students (participants) should revisit the success criteria and be able to tell whether they have met the criteria. Students (participants) should then be part of the development of next steps in planning how they continue to move their learning forward.

The Success Criteria can be written on a flipchart and remain posted during this workshop. The criteria are included on the evaluation form.

Before We Begin...



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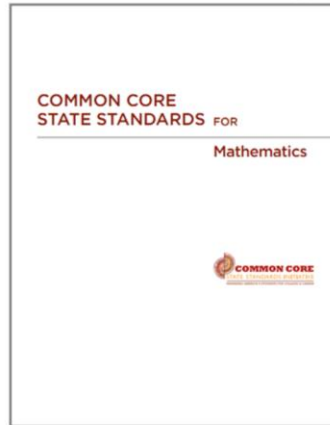


FYI – The Common Core State Standards (CCSS) and Connecticut Core Standards (CCS) are used interchangeably. In Connecticut, we have fully adopted the Common Core State Standards. In order to show our full support of these standards, in Connecticut we refer to them as the Connecticut Core Standards. Therefore, the Common Core State Standards ARE the Connecticut Core Standards.

The CCS Require Three Shifts in Mathematics

Handout
1

- **Focus** strongly where the standards focus
- **Coherence: Think** across grades and **link** to major topics within grades
- **Rigor:** In major topics, pursue **conceptual understanding**, procedural skill and **fluency**, and **application** with equal intensity



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Slide 5

Key Shifts of the Common Core State Standards:

There is a handout from AchievetheCore.com that provides an explanation of the shifts. It is not necessary to review the handout, but let participants know that a handout that addresses the key shifts is included in their folder. As facilitator, you should remind participants that the shifts do include the following:

- 1) Focus strongly where the Standards focus**
 - These standards are a move away from providing a mile-wide, inch-deep curriculum.
 - We focus deeply on the **major work** of each grade so that students can gain strong foundations and develop:
 - solid conceptual understanding
 - a high degree of procedural skill and fluency
 - the ability to apply the math they know to solve problems inside and outside the math classroom
- 2) Coherence: think across grades, and link to major topics within grades**
 - **Thinking across grades:**
 - The Standards are designed around coherent progressions from grade to grade
 - Learning is connected across grades
 - Students can build new understanding onto foundations built in previous years
 - Each standard is not a new event, but an extension of previous learning
 - **Linking to major topics:**
 - Additional or supporting topics shouldn't detract from the focus of the grade but are incorporated within the grade level focus.
- 3) Rigor: in major topics with equal intensity pursue-**
 - **Conceptual understanding:**
 - The Standards call for conceptual understanding of key concepts
 - Students should see math as more than a set of mnemonics or discrete procedures
 - **Procedural skill and fluency:**
 - The Standards call for speed and accuracy in calculation.
 - Providing instruction based on developing understanding of the underlying properties of operations and the relationships across operations will eventually lead to students committing core functions, such as single digit multiplication to memory.
 - **Application:**
 - The Standards call for students to use math flexibly for applications in problem-solving contexts both within and outside mathematics content.

Key Areas of Focus in Mathematics

Grade	Focus Areas in Support of Rich Instruction and Expectations of Fluency and Conceptual Understanding
K–2	Addition and subtraction - concepts, skills, and problem solving and place value
3–5	Multiplication and division of whole numbers and fractions – concepts, skills, and problem solving
6	Ratios and proportional reasoning; early expressions and equations
7	Ratios and proportional reasoning; arithmetic of rational numbers
8	Linear algebra and linear functions



Shift #1 references “the major work” of the grade. The key areas of focus in mathematics are described by grade band. (Read the grade-band key areas of focus from slide)

Note that this chart summarizes the critical areas of focus and the information aligns with the major, supporting and additional work identified by assessment consortia content specifications and the K-8 Publishers’ Criteria. We will have the opportunity to examine the grade level foci during our work today.

Shift #3: Rigor

Required Fluencies for Grades K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Add/subtract within 20 (know single-digit sums from memory) Add/subtract within 100
3	3.OA.7 3.NBT.2	Multiply/divide within 100 (know single-digit products from memory) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations



Shift #3 references required fluencies for Grades K-6.

- Throughout the K-6 standards in CCSSM there are also individual content standards that set expectations for fluency in computation (e.g., fluent multiplication and division within the times tables in Grade 3).
- Such standards are culminations of progressions of learning, often spanning several grades, involving conceptual understanding, thoughtful practice, and extra support where necessary.

The Standards for Mathematical Content

COMMON CORE STATE STANDARDS

Operations and Algebraic Thinking

3.OA

Represent and solve problems involving multiplication and division.

1. Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5×7 .*
2. Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.*
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem!
4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 \times ? = 48$, $5 = \square \div 3$, $6 \times 6 = ?$.*

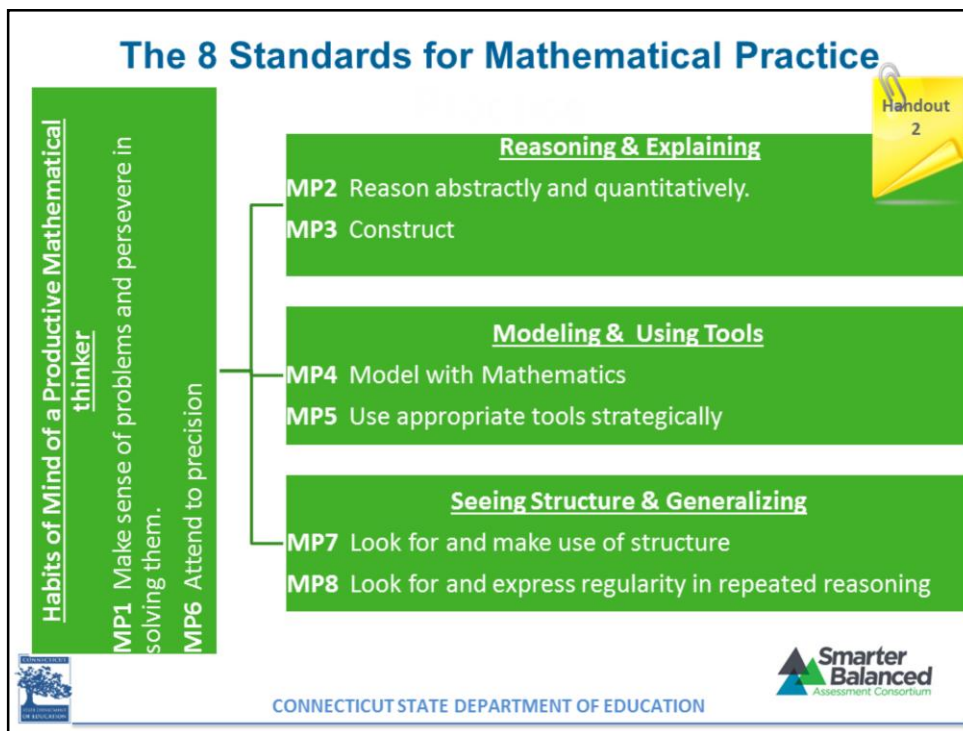


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As you know, the CCS for Mathematics is comprised of two equally important components, the Standards for Mathematical Content and the Standards for Mathematical Practice.

The Standards for Mathematical Content specify the mathematics content that should be taught at each grade level, or in the case of high school, the mathematics that all students should study in order to be college and career ready upon graduation from high school.



This is an overview of the 8 Standards for Mathematical Practice. This template was created by Dr. Bill McCallum, lead head writer of the CCSS mathematics.

Remind participants that these eight Standards for Mathematical Practice (SMP) describe expertise that every teacher of mathematics should strive to develop in their students. The standards describe student behaviors.

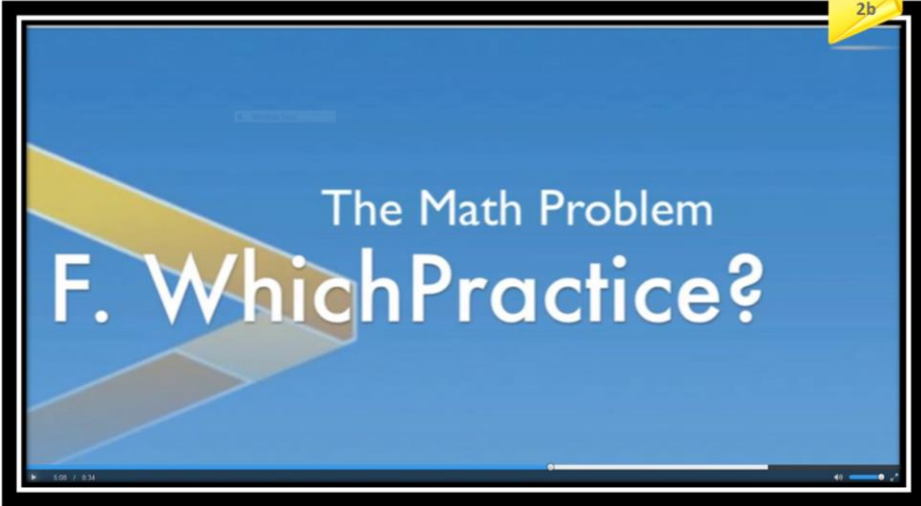
These practice standards describe varieties of expertise that mathematics educators AT ALL LEVELS [Kindergarten through HS] should seek to develop in their students.

These “habits of mind” mathematical practices encompass NCTM’S Mathematical process standards and the National Research Council’s mathematical proficiency strands. They carry across all grade levels.

The mathematically proficient student should have such a well-grounded understanding of how to employ the Standards for Mathematical Practice that they become Habits of Mind.

There is a handout in your packet that provides an overview of the 8 Practice Standards. This document describes the student behaviors for each Practice Standard. We will be looking for these required student behaviors as we engage in classroom activities and tasks.

Standards for Mathematical Practice



Handout 2b

The Math Problem
F. Which Practice?

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Smarter
Balanced
Assessment Consortium

You will need to have drop box installed on your computer to show this series of videos. Advance to marker 5:08 to play only clip F at this time. Have participants view this snippet and record their choice of the practice on the “Going Deeper” handout. Video from Debbie Waggoner’s site-<http://www.debbiewaggoner.com/math-practice-standards.html>

<http://www.debbiewaggoner.com/math-practice-standards.html> . ["Going Deeper" with Big Bang Theory.](#)

Reminders...

Keep in mind that the CCS for Mathematics:

- are **NOT** discrete skills to be taught in isolation.
- define both content and practices that should be included in instruction.

Cloning, drilling and killing is **not** an effective instructional practice.

High quality instruction → Improved student achievement



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This presentation is **not** about starting with a standardized test and trying to figure out how to prepare your students. **Cloning, drilling and killing is not an effective instructional practice.**

This presentation will focus on how the CCS Standards for Mathematical Content, Standards for Mathematical Practice and the 8 Mathematics Teaching Practices from NCTM's *Principles to Actions* are embodied in the Smarter Balanced Mathematics Claims.

High quality instruction focused on developing students' habits of mind with the Practice Standards is transferable to the Smarter Balanced assessments.

From this point forward we are asking **participants to be in the position of learners**. We will be modeling for you ways to support content, develop expertise with the Standards for Mathematical Practice and incorporate the 8 Mathematics Teaching Practices into your daily instruction.

Much of this may be validating. You may see many of the best practices you are already using in your classroom. We hope to show you multiple pathways to integrating the standards into your instruction. By the end of this presentation, we will specifically connect how these instructional practices connect to the claims of the Smarter Balanced assessment.

Remember, if you are teaching a curriculum aligned to the Connecticut Core Standards , you are preparing your students for college and career readiness. The Smarter Balanced resources such as the Digital Library and the Interim Assessments (addressed later on) can help teachers adjust and modify teaching and learning. The summative assessment will take care of itself.

NCTM Principles to Actions: Ensuring Mathematical Success for All



The primary purpose of Principles to Actions is to fill the gap between the adoption of rigorous standards and the enactment of practices, policies, programs, and actions required for successful implementation of those standards.

NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM



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The National Council of Teachers of Mathematics (NCTM) recently published *Principles to Actions: Ensuring Mathematical Success for All*. Each participant will receive this e-book publication.

(Read the slide for the primary purpose of Principles to Action)

Guiding Principles for School Mathematics

1. Teaching and Learning

2. Access and Equity

3. Curriculum

4. Tools and Technology

5. Assessment

6. Professionalism

Essential
Elements
of Effective
Mathematics
Programs

NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: Executive Summary <http://www.nctm.org/PrinciplestoActions/>



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Principles to Actions Exec. Summary: <http://www.nctm.org/PrinciplestoActions/> Also see link for the Executive Summary in Resources

NCTM's *Principles to Actions* addresses and documents the realities that exist in too many classrooms, schools, and districts across our nation, including:

- Too much focus on learning procedures without any connection to meaning, understanding, or the applications that require these procedures.
- Too many students are limited by the lower expectations and narrower curricula of remedial tracks from which few ever emerge.
- Too many teachers have limited access to the instructional materials, tools, and technology that they need.

Three aspects of *Principles to Actions* are new, provocative, and important.

1. *Principles to Actions* devotes the largest section to Teaching and Learning, the first Guiding Principle, and describes and illustrates eight Mathematics Teaching Practices that research indicates need to be consistent components of every mathematics lesson.
2. For each Guiding Principle, *Principles to Actions* offers commentary and a table that address productive and unproductive beliefs as part of a realistic appraisal of the obstacles that we face, as well as suggestions for overcoming these obstacles. A listing the productive and unproductive beliefs can be found on page 11 of the book.

3. Principles to Actions issues a forceful call to action, asserting that all of us who are stakeholders have a role to play and important actions to take if we are finally to recognize our critical need for a world where the mathematics education of our students draws from research, is informed by common sense and good judgment, and is driven by a nonnegotiable belief that we must develop mathematical understanding and self-confidence in **all** students.

Make all participants aware that the *Principles to Actions* e-book has been sent to their work email as a supportive resource for standards-based instruction.

Eight Mathematics Teaching Practices

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. Build procedural fluency from conceptual understanding
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking

NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM, p.10

<http://www.nctm.org/PrinciplestoActions/>



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Principles to Actions outlines eight Mathematics Teaching Practices that provide a framework for strengthening the teaching and learning of mathematics.

This research-informed framework reflects learning principles and knowledge of mathematics teaching that has accumulated over the last two decades.

The eight Mathematics Teaching Practices represent a core set of high-leverage practices and essential teaching skills necessary to promote deep learning of mathematics.

Turn to page 3 in the *Principles to Action* Executive Summary.

The eight practices are... (read from slide).

We will incorporate these teaching practices into our discussion about the relationship between the CCS Standards for Mathematical Content, the Standards for Mathematical Practice and the Smarter Balanced Claims.

Standards for Mathematical Practice



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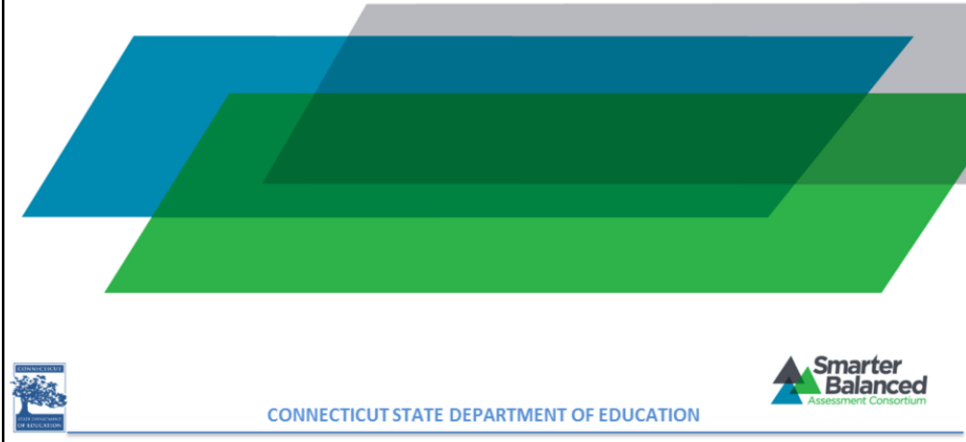
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<https://www.dropbox.com/s/0xquhbcx9nwj8k8/Math%20Practice%20Standards.mov>
Video from Debbie Waggoner's site-<http://www.debbiewaggoner.com/math-practice-standards.html> . "Going Deeper" with Big Bang Theory.

Advance the Big Bang Theory videos to marker 3:39 for this clip which ends at 4:28.

Have participants enter the SMP on their recording sheet, Handout 2b.

The Mathematics Claims



The Smarter Balanced Claims are summary statements about the knowledge and skills students will be expected to demonstrate on the assessment related to a particular aspect of the CCS for Mathematics.

Claims for the Mathematics Summative Assessment

Overall Claim for Grades 3-8

Students can demonstrate **progress toward** college and career readiness in mathematics.

Overall Claim for Grade 11

Students can demonstrate college and career readiness in mathematics.

Claim #1 – Concepts and Procedures

"Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency."

Claim #2 – 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."

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 #4 - Modeling and Data Analysis

"Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems."

From the [Smarter Balanced Mathematics Content Specifications](#)



The Overall Claims are specific to grades 3-8 (progressing towards college and career readiness) and grade 11 (demonstrate college and career readiness). The claims are summary statements about the knowledge and skills students will be expected to demonstrate on the assessment related to a particular aspect of the CT Core Standards for Mathematics. **The Overall Claim scale score will be reported along with an associated achievement level (1,2,3,4)**

The four Mathematics Claims under the Overall Claim across grades 3-8 and 11 are:

- Claim 1 – Concepts and Procedures. Claim 1 items measure the extent to which students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.
- Claim 2 – Problem Solving. Claim 2 items measure the extent to which students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.
- Claim 3 – Communicating Reasoning. Claim 3 items measure the extent to which students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.
- Claim 4 – Modeling and Data Analysis. Claim 4 items measure the extent to which students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

Claims 2 and 4 will be reported as one score.

For additional information about the Smarter Balanced Claims, refer to the Smarter Balanced Mathematics Content Specifications available on the Smarter Balanced Web site.

Overall Claim and Mathematics Teaching Practices

Overall Claim	Mathematics Teaching Practice
<p>Grades 3-8:</p> <ul style="list-style-type: none"> Students can demonstrate progress toward college and career readiness in mathematics. <p>Grade 11:</p> <ul style="list-style-type: none"> Students can demonstrate college and career readiness in mathematics. 	<p>Establishing Mathematics Goals to Focus Learning</p> <p>Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses goals to guide instructional decisions.</p> <p>Elicit and use evidence of student thinking</p> <p>Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning</p>

Just as the Overall Claim is a summary statement about what students know and can do by then end of the school year, the Mathematics Teaching Practices, Establishing Mathematics Goals to Focus Learning and Elicit and use evidence of student thinking, are practices that have overarching implications for instruction throughout the year.

By engaging in a shared understanding among teachers of the mathematics that students are learning and how this mathematics develops along the learning progressions, both prior learning and where it is going, teachers are better able to make decisions to guide instruction .

The establishment of clear goals not only guides teachers’ decision making during a lesson, but also focuses students’ attention on monitoring their own progress toward the intended learning outcomes.

Learning goals situated within mathematics learning progressions and connected to the “big ideas” of mathematics provide a stronger bases for teachers’ instructional decisions.

From Principles to Action, page 53:

“The gathering of evidence of student thinking should neither be left to chance nor occur sporadically. Preparation of each lesson needs to include intentional and systematic plans to elicit evidence that will provide “a constant steam of information

about how student learning is evolving toward the desired goal” (Heritage 2008, p.6).

Teacher and Student Actions

Establish mathematics goals to focus learning Teacher and student actions	
What are teachers doing?	What are students doing?
<p>Establishing clear goals that articulate the mathematics that students are learning as a result of instruction in a lesson, over a series of lessons, or throughout a unit.</p> <p>Identifying how the goals fit within a mathematics learning progression.</p> <p>Discussing and referring to the mathematical purpose and goal of a lesson during instruction to ensure that students understand how the current work contributes to their learning.</p> <p>Using the mathematics goals to guide lesson planning and reflection and to make in-the-moment decisions during instruction.</p>	<p>Engaging in discussions of the mathematical purpose and goals related to their current work in the mathematics classroom (e.g., What are we learning? Why are we learning it?)</p> <p>Using the learning goals to stay focused on their progress in improving their understanding of mathematics content and proficiency in using mathematical practices.</p> <p>Connecting their current work with the mathematics that they studied previously and seeing where the mathematics is going.</p> <p>Assessing and monitoring their own understanding and progress toward the mathematics learning goals.</p>

<http://www.nctm.org/PrinciplesToActions/>
 NCTM. (2014). Principles to Actions: Ensuring Mathematical Success
 for All. Reston, VA: NCTM p. 16



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The actions listed in this table summarize what teachers and students are doing in mathematics classrooms that use evidence of student thinking to assess, support, and extend learning.

Note for participants that each of the Mathematics Teaching Practices (MTP) is presented in this manner of illustrating teacher and student actions in *Principles to Actions*. Also note the connection to the 2014 CCT rubric. The evidence to support the indicators and attributes of the CCT are directly aligned with the teaching practices we will be discussing today.

Teacher and Student Actions

Elicit and use evidence of student thinking Teacher and student actions	
What are <i>teachers</i> doing?	What are <i>students</i> doing?
<p>Identifying what counts as evidence of student progress toward mathematics learning goals.</p> <p>Eliciting and gathering evidence of student understanding at strategic points during instruction.</p> <p>Interpreting student thinking to assess mathematical understanding, reasoning, and methods.</p> <p>Making in-the-moment decisions on how to respond to students with questions and prompts that probe, scaffold, and extend.</p> <p>Reflecting on evidence of student learning to inform the planning of next instructional steps.</p>	<p>Revealing their mathematical understanding, reasoning, and methods in written work and classroom discourse.</p> <p>Reflecting on mistakes and misconceptions to improve their mathematical understanding.</p> <p>Asking questions, responding to, and giving suggestions to support the learning of their classmates.</p> <p>Assessing and monitoring their own progress toward mathematics learning goals and identifying areas in which they need to improve.</p>

<http://www.nctm.org/PrinciplesToActions/>
NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM p. 56



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The actions listed in this table provide guidance on what teachers and students do in eliciting and using evidence of student thinking in the Mathematics Classroom.

Making the Classroom Connection

- Standards for Mathematical Practice
- Smarter Balanced Claims
- Mathematics Teaching Practices



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To formalize and solidify our goals for this session, we will be engaging in activities and using Handout # 4 throughout to document the connections among the eight Standards for Mathematical Practice; the four Smarter Balanced Claims; and the eight Mathematics Teaching Practices from NCTM's *Principles to Actions*: Exec. Summary: <http://www.nctm.org/PrinciplestoActions/> .

Claim 1

Concepts and Procedures



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We will now take a closer look at each of the Mathematics Claims and how the Connecticut Core Standards (CCS) for Mathematics connect to the Smarter Balanced Claims for Mathematics.

Claim 1: Concepts and Procedures

“Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.”



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Claim 1 items measure the extent to which students are able to explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Central to understanding this claim is making the connection to these elements of the mathematical practices as stated in the CCS for Mathematics.

- MP5. Use appropriate tools strategically.**
- MP6. Attend to precision.**
- MP7. Look for and make use of structure.**
- MP8. Look for and express regularity in**

repeated reasoning.

Smarter Balanced Assessment Targets

- Provide more detail about the range of content and Depth of Knowledge levels.
- Intended to support the development of high-quality items and tasks that contribute evidence to the claims.



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Each Claim is accompanied by a set of assessment targets that provide more detail about the range of content and Depth of Knowledge levels. The targets are intended to support the development of high-quality items and tasks that contribute [evidence to the claims](#).

(to determine the level of student understanding)

Smarter Balanced Cognitive Rigor Matrix

Depth of Thinking (Webb) + Type of Thinking (Revised Bloom)	DOK Level 1 Recall & Reproduction	DOK Level 2 Basic Skills & Concepts	DOK Level 3 Strategic Thinking & Reasoning	DOK Level 4 Extended Thinking
Remember	- Recall conversions, terms, facts			
Understand	- Evaluate an expression - Locate points on a grid or number on number line - Solve a one-step problem - Represent math relationships in words, pictures, or symbols	- Specify, explain relationships - Make basic inferences or logical predictions from data/observations - Use models (diagrams) to explain concepts - Make and explain estimates	- Use concepts to solve non-routine problems - Use supporting evidence to justify conjectures, generalizations, or connect ideas - Explain reasoning when more than one response is possible - Explain phenomena in terms of concepts	- Relate mathematical concepts to other content areas, other domains - Develop generalizations of the results obtained and the strategies used and apply them to new problem situations
Apply	- Follow simple procedures - Calculate, measure, apply a rule (e.g., rounding) - Apply algorithm or formula - Solve linear equations - Make conversions	- Select a procedure and perform it - Solve routine problem applying multiple concepts or decision points - Retrieve information to solve a problem - Translate between representations	- Design investigation for a specific purpose or research question - Use reasoning, planning, and supporting evidence - Translate between problem & symbolic notation when not a direct translation	- Initiate, design, and conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results
Analyze	- Retrieve information from a table or graph to answer a question - Identify a pattern/trend	- Categorize data, figures - Organize, order data - Select appropriate graph and organize & display data - Interpret data from a simple graph - Extend a pattern	- Compare information within or across data sets or texts - Analyze and draw conclusions from data, citing evidence - Generalize a pattern - Interpret data from complex graph	- Analyze multiple sources of evidence or data sets
Evaluate			- Cite evidence and develop a logical argument - Compare/contrast solution methods - Verify reasonableness	- Apply understanding in a novel way, provide argument or justification for the new application
Create	- Brainstorm ideas, concepts, problems, or perspectives related to a topic or concept	- Generate conjectures or hypotheses based on observations or prior knowledge and experience	- Develop an alternative solution - Synthesize information within one data set	- Synthesize information across multiple sources or data sets - Design a model to inform and solve a practical or abstract situation



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Smarter Balanced has incorporated Webb’s DOK levels into the Smarter Balanced Cognitive Rigor matrix in the Smarter Balanced Content Specifications. Claim 1 items will be at DOK levels 1 and 2. In terms of Bloom’s Types of Thinking, Claim 1 items will require understanding and application skills.
Hess’ Cognitive Rigor Matrix

Claim 1 Assessment Targets

GRADE 3 Summative Assessment Targets Providing Evidence Supporting Claim #1
Claim #1: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.
Content for this claim may be drawn from any of the Grade 3 clusters represented below, with a much greater proportion drawn from clusters designated "m" (major) and the remainder drawn from clusters designated "a/s" (additional/supporting) – with these items fleshing out the major work of the grade. Sampling of Claim #1 assessment targets will be determined by balancing the content assessed with items and tasks for Claims #2, #3, and #4. ⁵ Grade level content emphases are summarized in Appendix A and CAT sampling proportions for Claim 1 are given in Appendix B.
Operations and Algebraic Thinking
Target A [m]: Represent and solve problems involving multiplication and division.⁶ (DOK 1) Items/tasks for this target require students to use multiplication and division within 100 to solve straightforward, one-step contextual word problems in situations involving equal groups, arrays, and measurement quantities such as length, liquid volume, and masses/weights of objects. These problems should be of the equal-groups and arrays-situation types, but can include more difficult measurement quantity situations. All of these items/tasks will code straightforwardly to standard 3.OA.3. Few of these tasks coding to this standard will make the method of solution a separate target of assessment. Other tasks associated with this target will probe student understanding of the meanings of multiplication and division (3.OA.1,2). ⁷
Non-contextual tasks that explicitly ask the student to determine the unknown number in a multiplication or division equation relating three whole numbers (3.OA.4) will support the development of items that provide a range of difficulty necessary for populating an adaptive item bank (see section <i>Understanding Assessment Targets in an Adaptive Framework</i> , below, for further explanation).
Target B [m]: Understand properties of multiplication and the relationship between multiplication and division. (DOK 1) Whereas Target A focuses more on the practical uses of multiplication and division, Target B focuses more on the mathematical properties of these operations, including the mathematical relationship between multiplication and division.



From the Smarter Balanced Mathematics Content Specifications

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As outlined in the Smarter Balanced Mathematics Content Specifications, the Claim 1 Assessment Targets provide more detail about the range of content and Depth of Knowledge levels that are assessed in Claim 1.



The Assessment Targets were written to support the development of high-quality items and tasks that contribute evidence to the claims.

The Assessment Targets for Claim 1 are derived from the cluster headings of the content standards for the Common Core State Standards.

Targets for Claim 1 – concepts and procedures – are derived from the content standards for Common Core State standards. Use of more fine-grained descriptions would risk a tendency to atomize the content, which might lead to assessments that would not meet the intent of the standards. It is important to keep in mind the importance of developing items and tasks that reflect the richness of the mathematics in the CCSS-M.

Claim 1 and the Mathematics Teaching Practices

Claim 1	Mathematics Teaching Practices
Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency	<p>Use and connect mathematical representations</p> <p>Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.</p> <p>Build procedural fluency from conceptual understanding</p> <p>Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.</p>

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Classroom instruction that incorporates the mathematics teaching practices, “Use and connect mathematical representations” and “Build procedural fluency from conceptual understanding” will provide opportunities for students to develop the conceptual understandings and carry out mathematical procedures with precision and fluency that are expected for Claim 1.

When teachers employ the practice of using and connecting mathematical representations, students will be engaged in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.

Likewise, when teachers employ the practice of building procedural fluency from conceptual understanding, students, over time, will become skillful in using procedures flexibly as they solve contextual and mathematical problems.

The Standards call for speed and accuracy in calculation. Teachers should structure class time and/or homework time for students to practice core functions such as single-digit multiplication so that students have access to more complex concepts and procedures. Note that this is not memorization absent understanding. This is the outcome of a carefully laid out learning progression.

At the same time, we can't expect fluency to be a natural outcome without addressing

it specifically in the classroom and in our materials. Some students might require more practice than others, and that should be attended to.

Additionally, there is not one approach to get to speed and accuracy that will work for all students. All students, however, will need to develop a way to get there.

Teacher and Student Actions

Use and connect mathematical representations Teacher and student actions

What are teachers doing?	What are students doing?
<p>Selecting tasks that allow students to decide which representations to use in making sense of the problems.</p> <p>Allocating substantial instructional time for students to use, discuss, and make connections among representations.</p> <p>Introducing forms of representations that can be useful to students.</p> <p>Asking students to make math drawings or use other visual supports to explain and justify their reasoning.</p> <p>Focusing students' attention on the structure or essential features of mathematical ideas that appear, regardless of the representation.</p> <p>Designing ways to elicit and assess students' abilities to use representations meaningfully to solve problems.</p>	<p>Using multiple forms of representations to make sense of and understand mathematics.</p> <p>Describing and justifying their mathematical understanding and reasoning with drawings, diagrams, and other representations.</p> <p>Making choices about which forms of representations to use as tools for solving problems.</p> <p>Sketching diagrams to make sense of problem situations.</p> <p>Contextualizing mathematical ideas by connecting them to real-world situations.</p> <p>Considering the advantages or suitability of using various representations when solving problems.</p>

<http://www.nctm.org/PrinciplesToActions/>

NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM p. 29



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The teacher and student actions listed in this table provide a summary of what teachers and students do in using and connecting mathematical representations in teaching and learning mathematics.

Teacher and Student Actions

Build procedural fluency from conceptual understanding Teacher and student actions

What are teachers doing?	What are students doing?
<p>Providing students with opportunities to use their own reasoning strategies and methods for solving problems.</p> <p>Asking students to discuss and explain why the procedures that they are using work to solve particular problems.</p> <p>Connecting student-generated strategies and methods to more efficient procedures as appropriate.</p>	<p>Making sure that they understand and can explain the mathematical basis for the procedures that they are using.</p> <p>Demonstrating flexible use of strategies and methods while reflecting on which procedures seem to work best for specific types of problems.</p> <p>Determining whether specific approaches generalize to a broad class of problems.</p>

NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM p.47-48

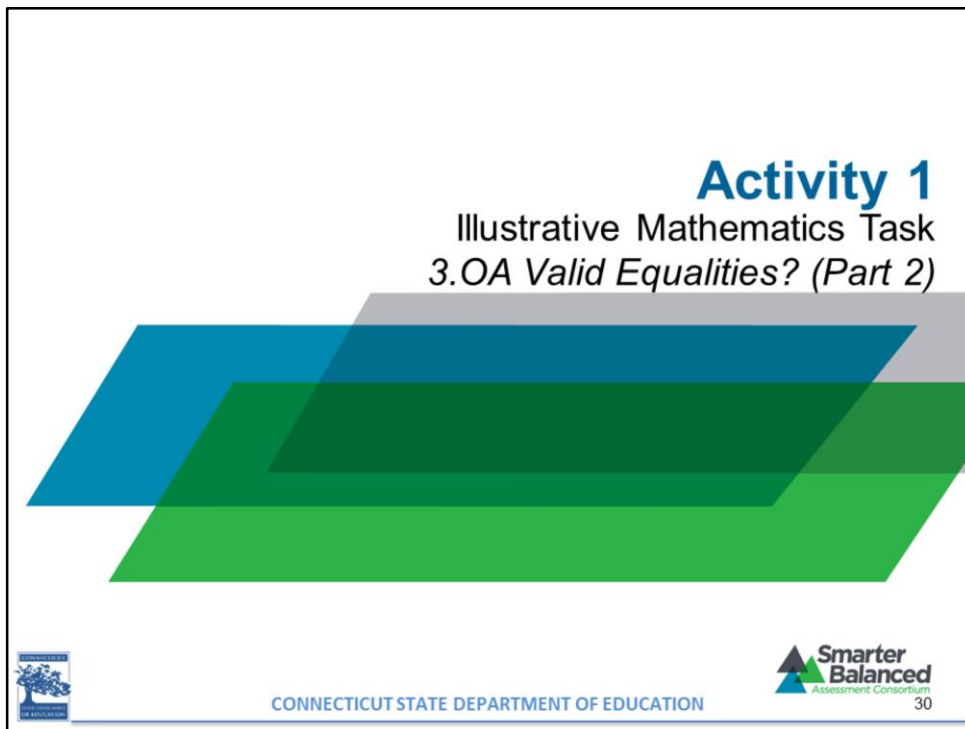


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The actions listed in this table summarize what teachers and students are doing in mathematics classrooms to build procedural fluency from conceptual understanding and problem-solving experiences.

The slide features a title 'Activity 1' in a large blue font, followed by 'Illustrative Mathematics Task' and '3.OA Valid Equalities? (Part 2)' in a smaller black font. Below the text is a graphic of three overlapping trapezoidal shapes in shades of blue and green. At the bottom left is the Connecticut State Department of Education logo, at the bottom center is the text 'CONNECTICUT STATE DEPARTMENT OF EDUCATION', and at the bottom right is the Smarter Balanced Assessment Consortium logo with the number '30' below it.

Activity 1
Illustrative Mathematics Task
3.OA Valid Equalities? (Part 2)

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We will now work on a task that addresses build procedural fluency from conceptual understanding.

This task is from Illustrative Mathematics and is a follow-up task to a first grade task: 1.OA Valid Inequalities.

On the surface, both tasks can be completed with sound procedural fluency in addition and multiplication. However, these tasks present the opportunity to delve much more deeply into equivalence and strategic use of mathematical properties. These tasks add clarity to the often misunderstood or neglected concept of equivalence.

Both tasks are examples of what classroom instruction should look like when attending to building procedural fluency from conceptual understanding.

Activity 1



Decide if the equations are true or false.
Explain your answer.

- a) $4 \times 5 = 20$
- b) $34 = 7 \times 5$
- c) $3 \times 6 = 9 \times 2$
- d) $5 \times 8 = 10 \times 4$
- e) $6 \times 9 = 5 \times 10$
- f) $2 \times (3 \times 4) = 8 \times 3$
- g) $8 \times 6 = 7 \times 6 + 6$
- h) $4 \times (10 + 2) = 40 + 2$



<https://www.illustrativemathematics.org/illustrations/1821>

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Facilitator Note: Direct participants to use Handout 3 for this activity. Ask participants to work through each question without looking at the solutions on page 2 of the handout. Once finished, they should read the solutions on page 2 and compare them to the explanations they provided.

Give groups about 3-5 minutes to share their responses to the question “Is there another way to know whether this equation is true?” Group members should look at the solutions provided on page 2 of the handout and share different explanations.

Providing the opportunity for students to share their thinking will not only allow each student to demonstrate their conceptual understanding of the underlying mathematics, but will allow for other students to hear different approaches that might build on their understanding of the underlying mathematics.

When students are asked to answer a question, elicit evidence of their understanding of the underlying mathematics by asking “HOW DO YOU KNOW?” or “EXPLAIN YOUR THINKING.”

Grade 3 **Domain OA:** Operations and Algebraic Thinking

Cluster Understand properties of multiplication and the relationship between multiplication and division. Standard Apply properties of operations as strategies to multiply and divide.* Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then

$15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)

Bringing It Back to the Standards



Using the “Bringing it Back to the Standards and the Teaching Practices” graphic organizer, identify which standards and teaching practices were addressed in Activity 1:

- Standards for Mathematical Content
- Standards for Mathematical Practice
- Mathematics Teaching Practices (including teacher/student actions)



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Note to facilitator: Each table should work with one copy of Handout #4, “Bringing it Back to the Standards and the Teaching Practices” graphic organizer.

Inform participants that they may refer to Handouts 2 (Practice Standards) and the Principles to Action Executive Summary to jot down the standards and teaching practices addressed in this activity.

For this particular activity, under “Standards for Mathematical Content,” participants should have noted:

- Domain: OA – Operations and Algebraic Thinking
- Cluster Heading: 3.OA.B : (Understand properties of multiplication and the relationship between multiplication and division.)
- Standard: 3.OA.B.5 (ask a participant to read the standard language from the flip book)

Under SMP:

- 1 **Make sense of problems and persevere in solving them.**
- 2 **Reason abstractly and quantitatively.**
- 3 Construct viable arguments and critique the reasoning of others.
- 4 Model with mathematics.
- 5 Use appropriate tools strategically.
- 6 **Attend to precision.**
- 7 **Look for and make use of structure.**

8 Look for and express regularity in repeated reasoning.

Under Mathematical Teaching Practices: 2, 3, 4, 6

1. Establish mathematics goals to focus learning.
2. **Implement tasks that promote reasoning and problem solving.**
3. **Use and connect mathematical representations**
4. **Facilitate meaningful mathematical discourse**
5. Pose purposeful questions
6. **Build procedural fluency from conceptual understanding**
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking

This activity should be part of a larger unit of study aligned to the domain Operations and Algebraic Thinking.”

This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.

Bringing it Back to the Assessment

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Which expression is equal to 3×7 ?

- (A) $(2 \times 7) + (1 \times 7)$
- (B) $(7 \times 5) - 2$
- (C) $(3 \times 4) + (3 \times 5)$
- (D) $(3 \times 4) \times 3$



From the Smarter Balanced Grade 3 Practice Test

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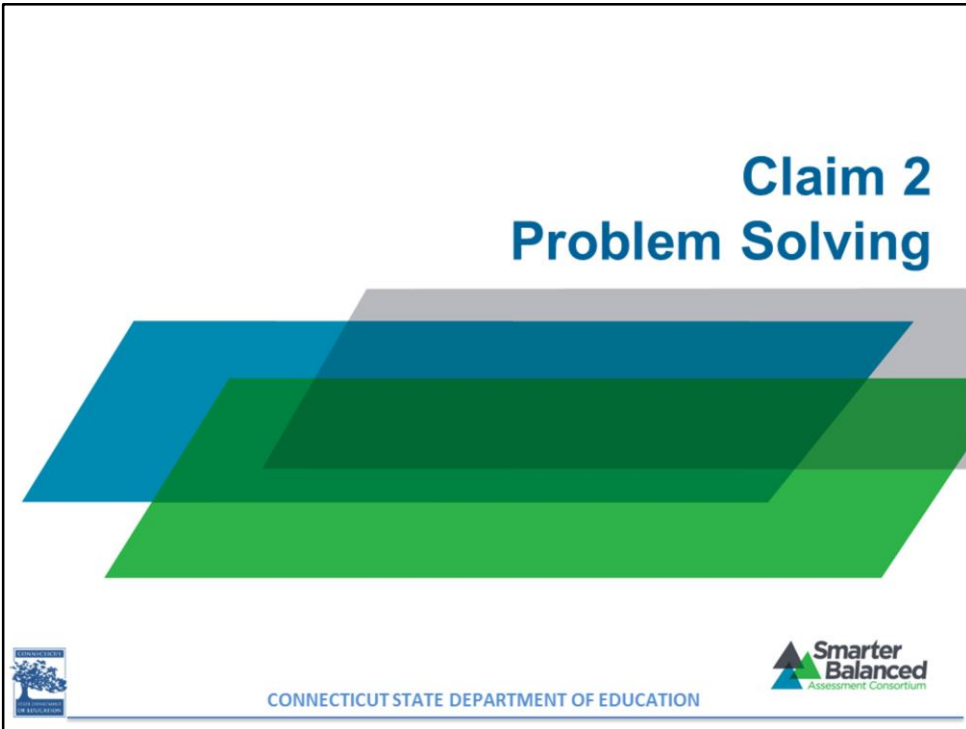
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This item is from the Smarter Balanced Grade 3 Practice Test. It is a Claim 1 item aligned to Operations and Algebraic Thinking Target B “Understand properties of multiplication and the relationship between multiplication and division.” Note that this is the cluster heading from the CCS.

Think about the evidence a teacher can collect from simply looking at the student response to this question. Even if the student selects the correct answer (A), during instruction, a teacher should ask the question, “How do you know?” The teacher might also ask, “Why do you think the other answers are incorrect?”

Cloning, drilling and killing exercises, where the student is presented with a number of items similar to this one, do not elicit the same level of evidence about the student’s understanding of the underlying mathematics. Rather, providing students with the opportunity to engage in a few examples with the expectation that they need to explain their thinking, is a far more effective teaching strategy to improve student learning.

Claim 2 Problem Solving



Let's move on to Claim 2: Problem Solving

Claim 2: 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.”



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Claim 2 items and tasks measure the extent to which students can solve a range of complex, well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.

Keep in mind that not all word problems are Claim 2. Word problems that are procedural are tagged to Claim 1.

Though not exclusive, MP1, MP5, MP7, and MP8 are particularly relevant for Claim 2 items.

Rationale for Claim 2

- 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 less structured than items and tasks presented under Claim 1. Students will need to select appropriate conceptual and physical tools to use.



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Claim 2 items may be pure mathematics or set in context.

As opposed to problems tagged to Claim 4, Claim 2 items are well posed, meaning that the students are **not** required to formulate a model to solve the problem, however, the solution path should not be obvious (this is Claim 1).

Tell participants to refer to Handout 2 that describes the student behaviors for each Practice Standard noted on the slide. We will be looking for these student behaviors as we engage in classroom activities and tasks.

Students are required to construct their own solution path. In some cases, there may be one solution path with multiple correct answers, or several solution paths that lead to a single correct answer.

Claim 2 Assessment Targets

Target A: Apply mathematics to solve well-posed problems in pure mathematics and arising in everyday life, society, and the workplace. (DOK 2, 3)

Target B: Select and use appropriate tools strategically. (DOK 1, 2)

Target C: Interpret results in the context of a situation. (DOK 2)

Target D: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas). (DOK 1, 2, 3)



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Unlike Claim 1 assessment targets which are grade-level specific, the Claim 2, 3 and 4 assessment targets are common across all grades.

As you can see, the language of the targets are drawn from the Standards for Mathematical Practice.

Claim 2 Content Standards by Grade Level						
Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	High School
3.OA.A	4.OA.A	5.NBT.B	6.RP.A	7.RP.A	8.EE.B	N-Q.A
3.OA.D	4.NBT.B	5.NF.A	6.NS.A	7.NS.A	8.EE.C	A-SSE.A
3.NBT.A*	4.NF.A	5.NF.B	6.NS.C	7.EE.A	8.F.A	A-SSE.B
3.NF.A	4.NF.B	5.MD.A*	6.EE.A	7.EE.B	8.F.B*	A-CED.A
3.MD.A	4.NF.C	5.MD.C	6.EE.B	7.G.A*	8.G.A	A-REI.2
3.MD.B*	4.MD.A*	5.G.A*	6.EE.C	7.G.B*	8.G.B	A-REI.B
3.MD.C	4.MD.C*		6.G.A*		8.G.C*	A-REI.C
3.MD.D*						A-REI.D
						F-IF.A
						F-IF.B
						F-IF.C
						F-BF.A
						G-SRT.C
						S-ID.C
						S-CP.A

* Denotes additional and supporting clusters


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This table was developed for item writers and identifies CCS domains and content clusters for Claim 2. Items and tasks can center on a single cluster listed, or synthesize across listed clusters within a grade. Note that at the high school level, some clusters that were not included in the Claim 1 targets are included as content to be assessed in Claim 2.


This information is provided in the Smarter Balanced Mathematics Content Specifications.

Claim 2 and the Mathematics Teaching Practices

Claim 2	Mathematics Teaching Practices
<p>Students can solve a range of complex, well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.</p>	<p>Implement tasks that promote reasoning and problem solving</p> <p>Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and that allow for multiple entry points and varied solution strategies.</p>



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Classroom instruction that incorporates the mathematics teaching practice, “Implement tasks that promote reasoning and problem solving” will provide opportunities for students to develop mathematical reasoning and problem solving skills that are expected for Claim 2.

From Principles to Action (page 17):

“To ensure that students have the opportunity to engage in high-level thinking, teachers must regularly select and implement tasks that promote reasoning and problem solving. These tasks encourage reasoning and access to the mathematics through multiple entry points, including the use of different representations and tools, and they foster the solving of problems through varied solution strategies.”

Teacher and Student Actions

Implement tasks that promote reasoning and problem solving Teacher and student actions

What are <i>teachers</i> doing?	What are <i>students</i> doing?
<p>Motivating students' learning of mathematics through opportunities for exploring and solving problems that build on and extend their current mathematical understanding.</p> <p>Selecting tasks that provide multiple entry points through the use of varied tools and representations.</p> <p>Posing tasks on a regular basis that require a high level of cognitive demand.</p> <p>Supporting students in exploring tasks without taking over student thinking.</p> <p>Encouraging students to use varied approaches and strategies to make sense of and solve tasks.</p>	<p>Persevering in exploring and reasoning through tasks.</p> <p>Taking responsibility for making sense of tasks by drawing on and making connections with their prior understanding and ideas.</p> <p>Using tools and representations as needed to support their thinking and problem solving.</p> <p>Accepting and expecting that their classmates will use a variety of solution approaches and that they will discuss and justify their strategies to one another.</p>

NCTM. (2014). Principles to Actions: Ensuring Mathematical Success for All. Reston, VA: NCTM p. 24



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The actions listed in this table provide a summary of what teachers and students need to do when implementing tasks that promote reasoning and problem solving in the mathematics classroom.

Activity 2

The Locker Game and The Very Hungry Caterpillar
Illustrative Mathematics



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The Locker Game



The 20 students in Mr. Wolf's 4th grade class are playing a game in a hallway that is lined with 20 lockers in a row.

- The **first** student starts with the first locker and goes down the hallway and opens all the lockers.
- The **second** student starts with the second locker and goes down the hallway and shuts every other locker.
- The **third** student stops at every third locker and opens the locker if it is closed or closes the locker if it is open.
- The **fourth** student stops at every fourth locker and opens the locker if it is closed or closes the locker if it is open.

This process continues until all 20 students in the class have passed through the hallway.

1. Which lockers are still open at the end of the game? Explain your reasoning.
2. Which lockers were touched by only two students? Explain your reasoning.
3. Which lockers were touched by only three students? Explain your reasoning.
4. Which lockers were touched the most?

<https://www.illustrativemathematics.org/illustrations/938>



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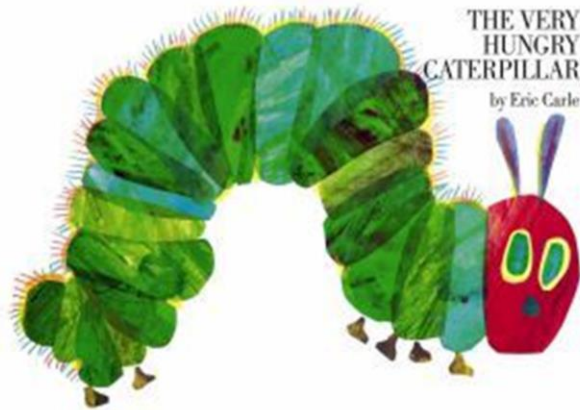
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Facilitator Note: There are two different tasks here. Choose either The Locker Game or The Very Hungry Caterpillar. Copies of the book should still be in the library of each RESC. They were provided when the last K-5 Mathematics Model Curriculum was rolled out.

Use **The Locker Game**, Handout 5 for grades 3-5.

Use **The Very Hungry Caterpillar**, Handout 6 for grades K-2.

The Very Hungry Caterpillar



<https://www.illustrativemathematics.org/illustrations/1150>



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Participants will need three ten frames, 30 Unifix cubes or counters and a blank piece of paper.

Instruct all to listen to the story, then work in pairs to determine how many things the caterpillar ate.

Bringing It Back to the Standards



Using the “Bringing it Back to the Standards and the Teaching Practices” graphic organizer, identify which standards and teaching practices were addressed in Activity 2:

- Standards for Mathematical Content
- Standards for Mathematical Practice
- Mathematics Teaching Practices (including teacher/student actions)



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Note to facilitator: Each table should work with one copy of Handout #4, “Bringing it Back to the Standards and the Teaching Practices” graphic organizer.

Inform participants that they may refer to Handouts 2 (Practice Standards) and the Principles to Action Executive Summary to jot down the standards and teaching practices addressed in this activity.

For this particular activity, under “Standards for Mathematical Content,” participants should have noted:

The Locker Game-Content 4.OA.B.4

Under SMP:

- 1 Make sense of problems and persevere in solving them.**
- 2 Reason abstractly and quantitatively.**
- 3 Construct viable arguments and critique the reasoning of others.
- 4 Model with mathematics.**
- 5 Use appropriate tools strategically.
- 6 Attend to precision.
- 7 Look for and make use of structure.**
- 8 Look for and express regularity in repeated reasoning.**

Under Mathematical Teaching Practices:

1. Establish mathematics goals to focus learning.
- 2. Implement tasks that promote reasoning and problem solving.**

3. Use and connect mathematical representations
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. **Build procedural fluency from conceptual understanding**
7. **Support productive struggle in learning mathematics**
8. Elicit and use evidence of student thinking

The Very Hungry Caterpillar-Content 1.OA.A.2; 1.OA.A.5; 1.OA.A.7; 1.NBT.B.2

Under SMP:

- 1 Make sense of problems and persevere in solving them.
- 2 **Reason abstractly and quantitatively.**
- 3 Construct viable arguments and critique the reasoning of others.
- 4 **Model with mathematics.**
- 5 **Use appropriate tools strategically.**
- 6 Attend to precision.
- 7 **Look for and make use of structure.**
- 8 **Look for and express regularity in repeated reasoning.**

Under Mathematical Teaching Practices:

1. Establish mathematics goals to focus learning.
2. **Implement tasks that promote reasoning and problem solving.**
3. **Use and connect mathematical representations**
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. **Build procedural fluency from conceptual understanding**
7. Support productive struggle in learning mathematics
8. **Elicit and use evidence of student thinking**

This activity should be part of a larger unit of study aligned to the domain Operations and Algebraic Thinking.

This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.

Bringing it Back to the Assessment

6



Connor is buying tickets to a concert. The concert he and his friends want to see costs \$4.75 per ticket. Connor has \$26.00 total.

What is the **greatest** number of tickets Connor can buy?

- (A) 4
- (B) 5
- (C) 6
- (D) 7



From the Smarter Balanced Grade 5 Practice Test

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This item is from the Smarter Balanced Grade 5 Practice Test. It is a Claim 2 item aligned to Target C, interpret results in the context of a situation.

Content: 5.NBT.B.7

SMP: 2

DOK: 2

What might a student do to find the correct response?

Think about the evidence a teacher can collect from simply looking at the student response to this question. A teacher should ask, “Is B the correct answer?”, during instruction, a teacher should ask the question, “How do you know?” The teacher might also ask, “Why do you think the other answers are incorrect?” Students should be provided an opportunity to share the strategies that they used to solve this problem.

Note: Calculator is not available at grades 3, 4 and 5.

Claim 3 Communicating Reasoning



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Now we will look at Claim 3, Communicating Reasoning.

Claim 3: Communicating Reasoning

“Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.”



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Claim 3 items and tasks measure the extent to which students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

Though not exclusive, MP3 and MP6 are particularly relevant for Claim 3 items.

Rationale for Claim 3

- Claim 3 refers to a recurring theme in the CCS for Mathematics 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 or a proposed solution to a problem and will ask students to provide an example, a justification, an explanation, or a counterexample.



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The Smarter Balanced assessments will attend thoroughly to those places in the content standards that call explicitly for communicating mathematics reasoning. For example, many content standards call for students to explain, justify, or illustrate.

This may look differently across grade levels, for example, in high school students may need to construct a deductive proof based on clearly stated axioms, where younger students will need to provide more informal justifications.

Typically, students are presented with a claim or a proposed solution to a problem and will be asked to provide an example, a justification, or a counterexample.

Targets for Claim 3

Target A: Test propositions or conjectures with specific examples. (DOK 2).

Target B: Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. (DOK 3, 4).

Target C: State logical assumptions being used. (DOK 2, 3)

Target D: Use the technique of breaking an argument into cases. (DOK 2, 3)

Target E: Distinguish correct logic or reasoning from that which is flawed and—if there is a flaw in the argument—explain what it is. (DOK 2, 3, 4)

Target F: Base arguments on concrete referents such as objects, drawings, diagrams, and actions. (DOK 2, 3)

Target G: At later grades, determine conditions under which an argument *does* and *does not* apply. (DOK 3, 4)



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Like Claim 2, the assessment targets for Claim 3 are common across all grades.

As you can see, the language of the targets are drawn from the Standards for Mathematical Practice.



Claim 3 Standards by Grade Level						
Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	HS
3.OA.B	4.OA.3	5.NBT.2	6.RP.A	7.RP.2	8.EE.1	N-RN.A
3.NF.A	4.NBT.A	5.NBT.6	6.RP.3	7.NS.A	8.EE.5	N-RN.B
3.NF.1	4.NBT.5	5.NBT.7	6.NS.A	7.NS.1	8.EE.6	N-RN.3
3.NF.2	4.NBT.6	5.NF.1	6.NS.1	7.NS.2	8.EE.7a	A-SSE.2
3.NF.3	4.NF.A	5.NF.2	6.NS.C	7.EE.1	8.EE.7b	A-APR.1
3.MD.A	4.NF.1	5.NF.B	6.NS.5	7.EE.2	8.EE.8a	A-REI.A
3.MD.7	4.NF.2	5.NF.3	6.NS.6		8.F.1	A-REI.1
	4.NF.3a	5.NF.4	6.NS.7		8.F.2	A-REI.2
	4.NF.3b	5.NF.7a	6.EE.A		8.F.3	A-REI.10
	4.NF.3c	5.NF.7b	6.EE.3		8.G.1	A-REI.11
	4.NF.4a	5.MD.C	6.EE.4		8.G.2	F-IF.1
	4.NF.4b	5.MD.5a	6.EE.B		8.G.4	F-IF.5
	4.NF.C	5.MD.5b	6.EE.6		8.G.5	F-IF.9
	4.NF.7	5.G.B*	6.EE.9		8.G.6	G-CO.C
		5.G.4*			8.G.8	G-CO.9
						G-CO.10
						G-CO.11
						A-APR.B
						A-APR.4
						A-APR.6
						A-REI.C
						F-BF.3
						F-BF.4a
						F-TF.1
						F-TF.2
						F-TF.8
						G-CO.A
						G-CO.B
						G-SRT.A
						G-SRT.B

Like the table we looked at earlier for Claim 2, this table was developed for item writers and identifies CCS domains and content clusters for Claim 3. Items and tasks can center on a single cluster listed, or synthesize across listed clusters within a grade. Note that at the high school level, some clusters that were not included in the Claim 1 targets are included as content to be assessed in Claim 3.

This information is provided in the Smarter Balanced Mathematics Content Specifications.

Claim 3 and the Mathematics Teaching Practices

Claim 3	Mathematics Teaching Practices
Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.	<p>Facilitate meaningful mathematical discourse Effective teaching of mathematics facilitates discourse among students in order to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.</p> <p>Pose purposeful questions Effective teaching of mathematics uses purposeful questions to assess and advance student reasoning and sense making about important mathematical ideas and relationships.</p>

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Classroom instruction that incorporates the mathematics teaching practices, “Facilitate meaningful mathematical discourse” and “Pose purposeful questions” will provide opportunities for students to build shared understanding of mathematical ideas by analyzing and comparing various approaches and arguments as well as assess and advance student reasoning and sense making which is expected in Claim 3.

From Principles to Action (page 29 and 35):

“Mathematical discourse includes the purposeful exchange of ideas through classroom discussion, as well as through other forms of verbal, visual, and written communication.”

“Purposeful questions allow teachers to discern what students know and adapt lessons to meet varied levels of understanding, help students make important mathematical connections, and support students in posing their own questions.”

Teacher and Student Actions

Facilitate meaningful mathematical discourse Teacher and student actions	
What are teachers doing?	What are students doing?
<p>Engaging students in purposeful sharing of mathematical ideas, reasoning, and approaches, using varied representations.</p> <p>Selecting and sequencing student approaches and solution strategies for whole-class analysis and discussion.</p> <p>Facilitating discourse among students by positioning them as authors of ideas, who explain and defend their approaches.</p> <p>Ensuring progress toward mathematical goals by making explicit connections to student approaches and reasoning.</p>	<p>Presenting and explaining ideas, reasoning, and representations to one another in pair, small-group, and whole-class discourse.</p> <p>Listening carefully to and critiquing the reasoning of peers, using examples to support or counterexamples to refute arguments.</p> <p>Seeking to understand the approaches used by peers by asking clarifying questions, trying out others' strategies, and describing the approaches used by others.</p> <p>Identifying how different approaches to solving a task are the same and how they are different.</p>

NCTM. (2014). Principles to Actions: Ensuring Mathematical Success for All. Reston, VA: NCTM p. 35



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The actions listed in this table provide guidance on what teachers and students do as they engage in meaningful mathematical discourse in the mathematics classroom.

Teacher and Student Actions

Pose purposeful questions Teacher and student actions	
What are teachers doing?	What are students doing?
<p>Advancing student understanding by asking questions that build on, but do not take over or funnel, student thinking.</p> <p>Making certain to ask questions that go beyond gathering information to probing thinking and requiring explanation and justification.</p> <p>Asking intentional questions that make the mathematics more visible and accessible for student examination and discussion.</p> <p>Allowing sufficient wait time so that more students can formulate and offer responses.</p>	<p>Expecting to be asked to explain, clarify, and elaborate on their thinking.</p> <p>Thinking carefully about how to present their responses to questions clearly, without rushing to respond quickly.</p> <p>Reflecting on and justifying their reasoning, not simply providing answers.</p> <p>Listening to, commenting on, and questioning the contributions of their classmates.</p>



NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM p. 41


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The actions listed in this table provide guidance on what teachers and students do when using questions purposefully in the mathematics classroom.

Activity 3
Composing and Decomposing Numbers
Grade 2



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The next activity is a grade 2 activity from Illustrative Mathematics and annotated by Achieve the Core.

Activity 3



Lamar wants to make the number 261. He has plenty of hundreds blocks and ones blocks to work with, but only 4 tens blocks.

His friend Jose said,

You can still make 261 with the blocks you have.

Show or Explain how Lamar can make 261.

<http://achievethecore.org/page/613/three-composing-decomposing-problems-detail-pg>



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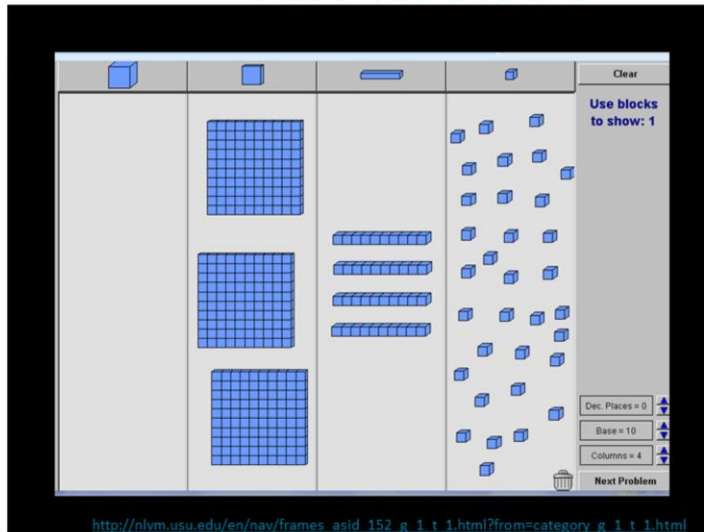
Facilitator Note: There are three problems in this set (A, B & C). We are focusing on problem B

Participants will need base ten blocks or pictures to complete this task. The National Library of Virtual Manipulatives can also be used to guide participants through completing the activity. You will need to upload Java to do so.

http://nlvm.usu.edu/en/nav/frames_asid_152_g_1_t_1.html?from=grade_g_1.html .

Allow participants 2 minutes to think about possible solutions before advancing to next slide.

NLVM Base Ten Blocks



http://nlvm.usu.edu/en/nav/frames_asid_152_g_1_t_1.html?from=category_g_1_t_1.html



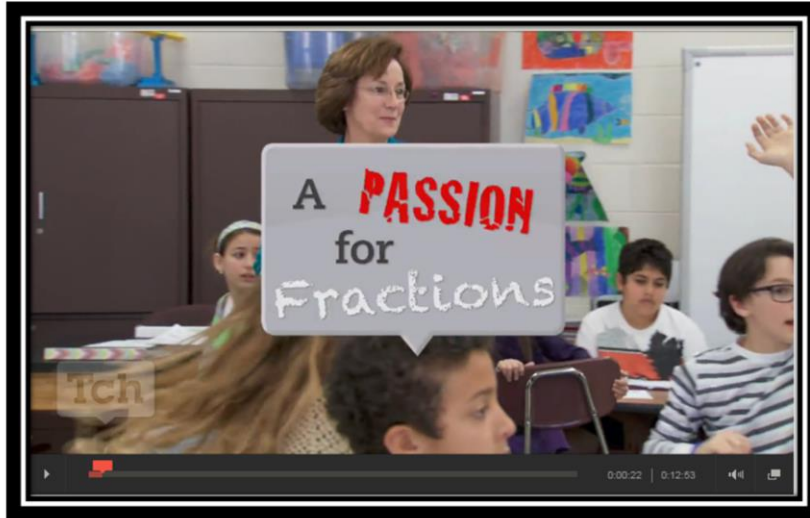
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This slide demonstrates the use of base ten blocks from the National Library of Virtual Manipulatives. Use Google Chrome instead of IE if you plan to access this. Connection to ELA/Literacy Standards... The importance of close reading of this problem (Lamar has only 4 tens blocks). Click on the block and drag it into the appropriate box below.

A Passion for Fractions



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A Passion for Fractions https://www.teachingchannel.org/videos/multiplying-fractions-lesson/?utm_source=newsletter20141011

Show participants this video. Have participants record the information on their handout #4. Stop at 10:35 to allow time for discussion of the Mathematics Teaching Practices that are noted.

Content: 5.NF.B.4b

Practice.MP2 Math.Practice.MP3

Bringing It Back to the Standards



Using the “Bringing it Back to the Standards and the Teaching Practices” graphic organizer, identify which standards and teaching practices were addressed in Activity 2:

- Standards for Mathematical Content
- Standards for Mathematical Practice
- Mathematics Teaching Practices (including teacher/student actions)



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Note to facilitator: Each table should work with one copy of Handout #4, “Bringing it Back to the Standards and the Teaching Practices” graphic organizer. Much of this information was actually provided during the video.

Inform participants that they may refer to Handouts 2 (Practice Standards) and the Principles to Action Executive Summary to jot down the standards and teaching practices addressed in this activity.

For this particular activity, under “Standards for Mathematical Content,” participants should have noted the bolded practices:

Lamar activity: Content 2 NBT.A.1

Under SMP:

- 1 Make sense of problems and persevere in solving them.**
- 2 Reason abstractly and quantitatively.**
- 3 Construct viable arguments and critique the reasoning of others.**
- 4 Model with mathematics.**
- 5 Use appropriate tools strategically.**
- 6 Attend to precision.**
- 7 Look for and make use of structure.
- 8 Look for and express regularity in repeated reasoning.

Under Mathematical Teaching Practices:

1. Establish mathematics goals to focus learning.
2. **Implement tasks that promote reasoning and problem solving.**
3. **Use and connect mathematical representations**
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. Build procedural fluency from conceptual understanding
7. Support productive struggle in learning mathematics
8. **Elicit and use evidence of student thinking**

This activity should be part of a larger unit of study aligned to the domain Number and Operations in Base Ten.

This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.

Facilitator Notes: Have participants watch the video and complete Handout 5 at the table. 10 minutes

A Passion for Fractions: Content 5.NF. B. 4b

Under SMP:

- 1 Make sense of problems and persevere in solving them.
- 2 Reason abstractly and quantitatively.
- 3 Construct viable arguments and critique the reasoning of others.
- 4 Model with mathematics.
- 5 Use appropriate tools strategically.
- 6 Attend to precision.
- 7 Look for and make use of structure.
- 8 Look for and express regularity in repeated reasoning.

Under Mathematical Teaching Practices:

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. Build procedural fluency from conceptual understanding
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking

This activity should be part of a larger unit of study aligned to the domain Number and Operations-Fractions

This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.

Bringing it Back to the Assessment

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Select **all** the numbers that make this inequality true.

$$2\frac{1}{8} > \square + 1 + \frac{1}{8}$$

$\frac{1}{8}$

$\frac{4}{8}$

$\frac{10}{8}$

$\frac{16}{8}$



From the Smarter Balanced Grade 4 Practice Test

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This item is from the Smarter Balanced Grade 4 Practice Test. It is a Claim 3 item aligned to Target D, use the technique of breaking an argument into cases.

Content: 4.NF.B.3

SMP: 7

DOK: 3

Think about the evidence a teacher can collect from simply looking at the student response to this question. Even if the student selects the correct answers $\frac{1}{8}$ and $\frac{4}{8}$, during instruction, a teacher should ask the question, “How do you know?” The teacher might also ask, “Why do you think the other answers are incorrect?”

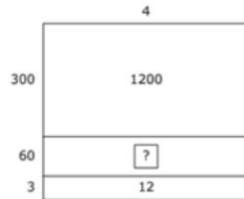
During instruction students should be asked to justify their selections using models such as number lines, and fraction strips or bars.

Bringing it Back to the Assessment

9



Jasmine solves the equation $\square \div 4 = 363$ using this area model.



Which statement explains how Jasmine should solve for the missing number in the model?

- (A) Jasmine should divide 60 by 4.
- (B) Jasmine should divide 1200 by 12.
- (C) Jasmine should multiply 3 times 60.
- (D) Jasmine should multiply 4 times 60.

From the Smarter Balanced Grade 5 Practice Test



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This item is from the Smarter Balanced grade 5 practice test. It is a claim 3 item aligned to target A, test propositions or conjectures with specific examples.

Domain: NBT

Content: 5.NBT.B.6

SMP: 1,3

DOK: 3

Facilitator notes: Give each table 5 minutes to discuss what each choice reveals about a student's understanding. What does that mean for instruction?

Think about the evidence a teacher can collect from simply looking at the student response to this question. Even if the student selects the **correct answer d**, during instruction, a teacher should ask the question, "How do you know?" The teacher might also ask, "Why do you think the other answers are incorrect?"

Claim 4 Modeling and Data Analysis



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Now we will look at Claim 4, Modeling and Data Analysis.

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.”



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Claim 4 items and tasks measure the extent to which students can analyze complex, real-world scenarios and construct and use mathematical models to interpret and solve problems.

Note to facilitator: **Read this definition of modeling drawn directly from the standards.**

“Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decision-making.” (p.72, CCSSM)

As such, modeling is the bridge across the “school math”/“real world” divide that has been missing from many mathematics curricula and assessments . Modeling is the twin of mathematical literacy, the focus of the PISA international comparison tests in mathematics. CCSSM features modeling as both a mathematical practice at all grades and a content focus in high school. (Smarter Balanced Content Specifications pg. 71) Though not exclusive, MP2, MP4, and MP5 are particularly relevant for Claim 4 items.

Rationale for Claim 4

- In the real world, problems do not come neatly “packaged.” Real-world problems are complex and often contain insufficient or superfluous data.
- Assessment tasks will involve *formulating* a problem that is tractable using mathematics; that is, formulating a model. This will usually involve making assumptions and simplifications.
- Students will need to select from the data at hand or estimate data that are missing. (Such tasks are therefore distinct from the well-formulated problem-solving tasks described in Claim 2.)
- Students will identify variables in a situation and construct relationships between them. Once students have formulated the problem, they will tackle it (often in a decontextualized manner) before interpreting their results and then checking the results for reasonableness.



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A key feature of items and tasks in Claim 4 is that the student is confronted with a contextualized, or “real world” situation and must decide which information is relevant and how to represent it.

“Real world” situations do not necessarily mean questions that a student might really face; it means that mathematical problems are embedded in a practical, application context.

Read the slide. This language comes directly from the Smarter Balanced Mathematics Content Specifications.

In this way, items and tasks in Claim 4 differ from those in Claim 2, because while the goal is clear, the Claim 4 problems themselves are not yet fully formulated (well-posed) in mathematical terms.

Items/tasks in Claim 4 assess student expertise in choosing appropriate content and using it effectively in formulating models of the situations presented and making appropriate inferences from them.

Claim 4 items and tasks should sample across the content domains, with many of these involving more than one domain.

Items and tasks of this sort require students to apply mathematical concepts at a

significantly deeper level of understanding of mathematical content than is expected by Claim 1.

Targets for Claim 4

Target A: Apply mathematics to solve problems arising in everyday life, society, and the workplace. (DOK 2, 3)

Target B: Construct, autonomously, chains of reasoning to justify mathematical models used, interpretations made, and solutions proposed for a complex problem. (DOK 2, 3, 4)

Target C: State logical assumptions being used. (DOK 1, 2)

Target D: Interpret results in the context of a situation. (DOK 2, 3)

Target E: Analyze the adequacy of and make improvements to an existing model or develop a mathematical model of a real phenomenon. (DOK 3, 4)

Target F: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas). (DOK 1, 2, 3)

Target G*: Identify, analyze and synthesize relevant external resources to pose or solve problems. (DOK 3, 4)



*Assessed in Performance Tasks only

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Like Claims 2 and 3, the assessment targets for Claim 4 are common across all grades.

As you can see, the language of the targets are drawn from the Standards for Mathematical Practice.

Claim 4 Clusters and Standards

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	HS
3.OA.A	4.OA.A	5.NBT.B	6.RP.A	7.RP.A	8.EE.3	N-Q.A
3.OA.D	4.NF.B	5.NF.A	6.NS.A	7.NS.A	8.EE.4	A-SSE.B
3.MD.A	4.MD.A*	5.NF.B	6.NS.C	7.EE.B	8.EE.B	A-CED.A
3.MD.C	4.MD.B*	5.MD.A*	6.EE.B	7.G.A*	8.EE.C	A-REI.A
3.MD.D*	4.MD.C*	5.MD.B*	6.EE.C	7.G.B*	8.F.B*	A-REI.B
		5.MD.C	6.G.A*	7.SP.A*	8.G.B	F-IF.B
		5.G.A*	6.SP.A*	7.SP.B*	8.G.C*	F-IF.C
			6.SP.B*	7.SP.C*	8.SP.A*	F-BF.A
						S-ID.A
						S-ID.B
						S-IC.1
						S-IC.B
						A-REI.C
						F-LE.A
						F-LE.B
						F-TF.5
						G-GMD.3
						G-MG

*Denotes additional and supporting clusters



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Like the tables we looked at earlier for Claims 2 and 3, this table was developed for item writers and identifies CCS domains and content clusters for Claim 4. Items and tasks can center on a single cluster listed, or synthesize across listed clusters within a grade. Note that at the high school level, some clusters that were not included in the Claim 1 targets are included as content to be assessed in Claim 4.

This information is provided in the Smarter Balanced Mathematics Content Specifications.

Claim 4 and the Mathematics Teaching Practices

Claim 4	Mathematics Teaching Practices
Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.	Support Productive Struggle in Learning Mathematics Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.

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Classroom instruction that incorporates the mathematics teaching practice, “[Support Productive Struggle in Learning Mathematics](#)” will provide opportunities for students to engage in productive struggles as they grapple with mathematical ideas and relationships that is needed to formulate the problems to be solved for Claim 4.

From Principles to Action (page 48):

“Such instruction embraces a view of students’ struggles as opportunities for delving more deeply into understanding the mathematical structure of problems and relationships among mathematical ideas, instead of simply seeking correct solutions. In contrast to productive struggle, unproductive struggle occurs when students “make no progress towards sense-making, explaining, or proceeding with a problem or task at hand (Warshauer 2011).”

“Teaching that embraced and uses productive struggle leads to long-term benefits, with students more able to apply their learning to new problem situations (Kapur 2010).”

Teacher and Student Actions

Support productive struggle in learning mathematics Teacher and student actions

What are <i>teachers</i> doing?	What are <i>students</i> doing?
<p>Anticipating what students might struggle with during a lesson and being prepared to support them productively through the struggle.</p> <p>Giving students time to struggle with tasks, and asking questions that scaffold students' thinking without stepping in to do the work for them.</p> <p>Helping students realize that confusion and errors are a natural part of learning, by facilitating discussions on mistakes, misconceptions, and struggles.</p> <p>Praising students for their efforts in making sense of mathematical ideas and perseverance in reasoning through problems.</p>	<p>Struggling at times with mathematics tasks but knowing that breakthroughs often emerge from confusion and struggle.</p> <p>Asking questions that are related to the sources of their struggles and will help them make progress in understanding and solving tasks.</p> <p>Persevering in solving problems and realizing that it is acceptable to say, "I don't know how to proceed here," but it is not acceptable to give up.</p> <p>Helping one another without telling their classmates what the answer is or how to solve the problem.</p>



NCTM. (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM p. 52

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This table summarizes teacher and student actions that embrace struggle as a natural aspect of learning in the mathematics classroom.

Activity 4

Comparing Money Raised

Grade 4



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Now we will look at a grade 4 activity from Illustrative Mathematics and annotated by Achieve the Core. It focuses on students ability to model a mathematical scenario by using drawings and equations.

Activity 4



C. Luis raised \$45 for the animal shelter, which was 3 times as much money as Anthony raised. How much money did Anthony raise?



<https://www.illustrativemathematics.org/illustrations/263>

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Facilitator Note: Handout 7 has four examples marked A, B, C and D. We will only be looking only at task C from this activity as an example of claim 4.

This is a grade 4 activity that is aligned with the major work of the grade: Operations and Algebraic Thinking.

Facilitator Note: Ask participants to identify why this is an example of Claim 4. Items and tasks measure the extent to which students can analyze complex, real-world scenarios and construct and use mathematical models to interpret and solve problems. They may also pick Target A or E.

Give groups 3-5 minutes to take a look at tasks A and B to determine which claims these tasks are aligned to. Task A is aligned to Claim 1 because it is procedural and Task B is aligned to Claim 2 because there are multiple approaches. A student could determine the answer using multiplication or division or even addition and subtraction.

Task D which is also found on the handout is another task that would be aligned to claim 4. (It is not necessary to have participants work through this task if time does not allow.)

Bringing it Back to the Assessment

9

Christy has \$60 to spend on plants.

She buys a peach tree for \$23 and a plum tree for \$19.

She wants to buy one more plant.

- Drag the numbers to the boxes and the symbols to the circles to create an equation to show how much money Christy has left to spend.
- Select one plant she **could** buy with the money she has left.

=

Grapevines, \$16
 Apple tree, \$18
 Pear tree, \$20
 Cherry tree, \$22

From the Smarter Balanced Grade 3 Practice Test



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Facilitator Notes: Give participants 2 minutes to read and independently solve this problem using a hard copy of the slide. Direct their attention away from the copy of the power point for this activity.

This item is from the Smarter Balanced Grade 3 Practice Test. It is a Claim 4 item aligned to target D, Interpret results in the context of a situation.

Content: 3.OA.D.8

SMP: 4, 6

DOK: 3

Bringing it Back to the Assessment

9

Christy has \$60 to spend on plants.

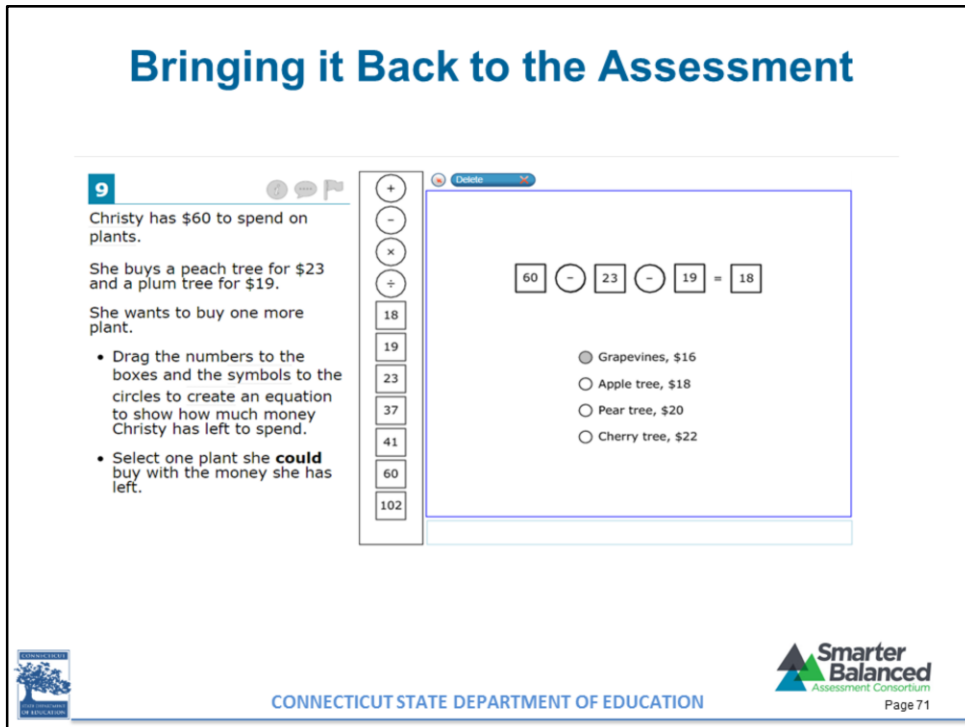
She buys a peach tree for \$23 and a plum tree for \$19.

She wants to buy one more plant.

- Drag the numbers to the boxes and the symbols to the circles to create an equation to show how much money Christy has left to spend.
- Select one plant she **could** buy with the money she has left.

$60 - 23 - 19 = 18$

- Grapevines, \$16
- Apple tree, \$18
- Pear tree, \$20
- Cherry tree, \$22



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Show this slide and inform them this is one possible correct answer. This problem has other correct responses. Have the participants discuss at their tables the other correct responses, and reflect on what is happening in their classrooms to support students' ability to respond to this type of question.

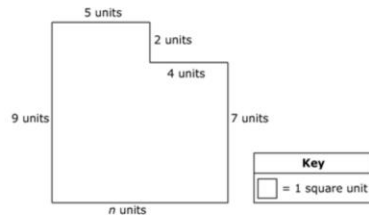
This is a one point problem and students must enter a correct equation and choose a correct plant to get the point. There is more than one possibility.

Bringing it Back to the Assessment

16



Juan draws a polygon with a perimeter of 36 units. He covers the area of the polygon with tiles that are each 1 square unit.



Part A: Enter an equation that could be used to find the value of n in the first response box.

Part B: Enter the number of tiles Juan uses to cover the polygon in the second response box.



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Facilitator Note: This should take 5 minutes to complete and 5 minutes to discuss. Use, only if time allows, to demonstrate a domain that has not yet been addressed. What do third graders need to know and be able to do in order to provide accurate answers?

This is from the Grade 3 Smarter Balanced Practice Test. It is a Claim 4 item aligned to Target C- state logical assumptions being used.

Grid paper is available for use participants think about and discuss how classroom instruction might prepare students to successfully respond to this prompt.

Please note: graph paper is not provided on the test until grade 6 and above.

Content: 3.MD.D.8; 3.MD.C.7b,d

SMP: 4

DOK: 4

Supporting Students Who Will Take the Smarter Balanced Assessments



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What else should teachers do to support students who will take the Smarter Balanced assessments?

Support for Students

- Providing high quality instruction throughout the year.
- Provide opportunities for students to engage with the Smarter Balanced Practice Tests and Training Tests.
 - Practice Tests are available by grade level
 - Practice Tests are available by grade-band
- Available on the Smarter Balanced Web site
<http://www.smarterbalanced.org/practice-test/>



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Besides providing high quality instruction throughout the year, teachers should also provide students with opportunities to engage with the Smarter Balanced Practice and Training Tests. The Practice and Training Tests are available on the Smarter Balanced Web site.

Purpose of the Practice Tests

- Allows teachers, students, parents, and other interested parties to experience a full grade-level assessment
- Provides an opportunity for students to become familiar with the keyboard commands and embedded universal tools, designated supports, and accommodations
- Provides an opportunity for students who use assistive technology to test the functionality prior to testing



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Practice Tests

- Grade-level scoring guides are available for download
- Important Limitations
 - The Practice Tests do not encompass the full range of content that students will encounter on the operational assessments in 2015, and **should not be used to guide instructional decisions.**



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Training Tests

- The Training Tests are designed to provide students and teachers with opportunities to quickly familiarize themselves with the software and navigational tools that they will use on the Smarter Balanced Assessments.
- The Training Tests are organized by grade bands (grades 3 to 5, 6 to 8, and high school) and each test contains 14-15 questions.
- The questions were selected to provide students with an opportunity to practice a range of question types.
- The Training Tests do not contain performance tasks. Similar to the Practice Test, the Training Tests includes all embedded universal tools, designated supports, and accommodations.



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How Does the Smarter Balanced Assessment System Support Instruction?



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The Smarter Balanced Assessment System

The Smarter Balanced Assessment System includes:

- Digital Library resources to help educators implement the *formative assessment process* to improve teaching and learning
- *interim assessments* to check student progress throughout the year and help teachers plan and improve instruction
- year-end *summative assessments* that are used for accountability purposes



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Along with the summative assessment that is used for accountability, the Smarter Balanced Assessment System also includes a Digital Library which contains tools and resources to support the formative assessment process.

The system also includes an interim assessment component which is can be used throughout the year to gauge student progress toward mastery of the skills measured by the summative assessment and to assess targeted concepts at strategic points during the school year.

Questions



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Success Criteria

- I can explain how the Connecticut Core Standards (CCS) for Mathematics connect to the Smarter Balanced Claims.
- I can meet the scope of the Content Standards and Practice Standards through best practices and by incorporating a variety of strategies and activities in my instruction.



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These are the Success Criteria we began with today.

Ask participants to reflect on how well they met the success criteria as they complete the workshop evaluations.

Thank you!

Resources

- CT Core Standards: <http://ctcorestandards.org/>
- Connecticut Dream Team 2014 ELA Resources: http://ctcorestandards.org/?page_id=869
- Connecticut Dream Team 2014 Mathematics Resources: http://ctcorestandards.org/?page_id=4566
- iCONN.org – Connecticut's **research** engine



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This slide includes some resources. CT Core Standards is updated weekly and is a comprehensive location for resources and professional development

Resources

- Smarter Balanced Assessment Consortium:
<http://www.smarterbalanced.org/>
- Link to CSDE Student Assessment Smarter Balanced page:
<http://www.sde.ct.gov/sde/cwp/view.asp?a=2748&q=334488>
- Achieve the Core: <http://achievethecore.org/>



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* Please see the Resources page in your folder for a more extensive listing.