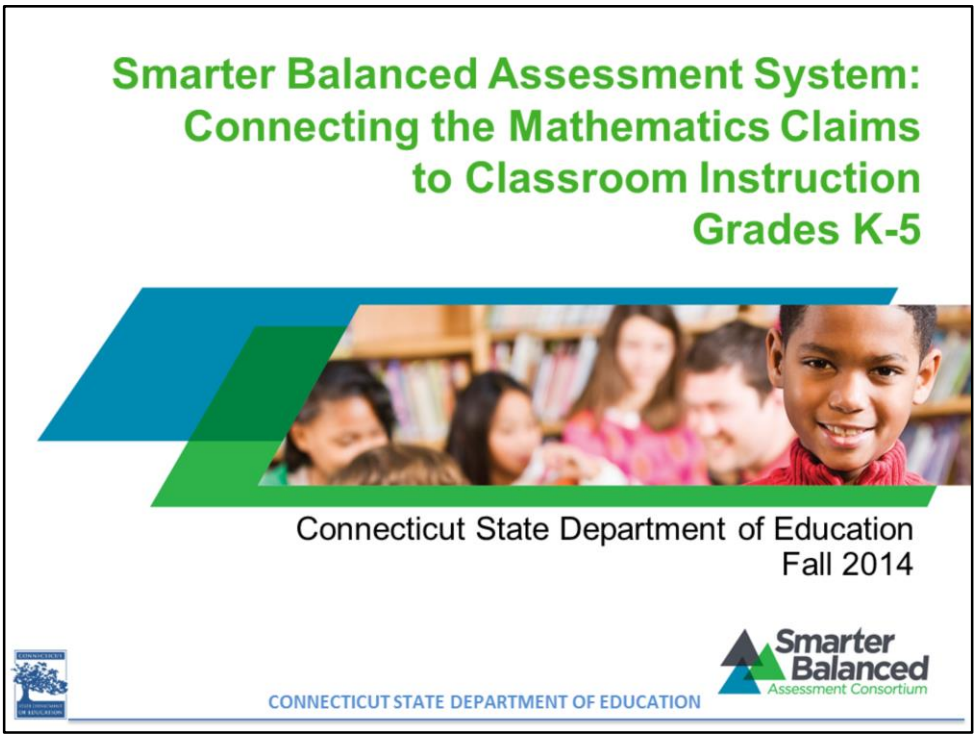
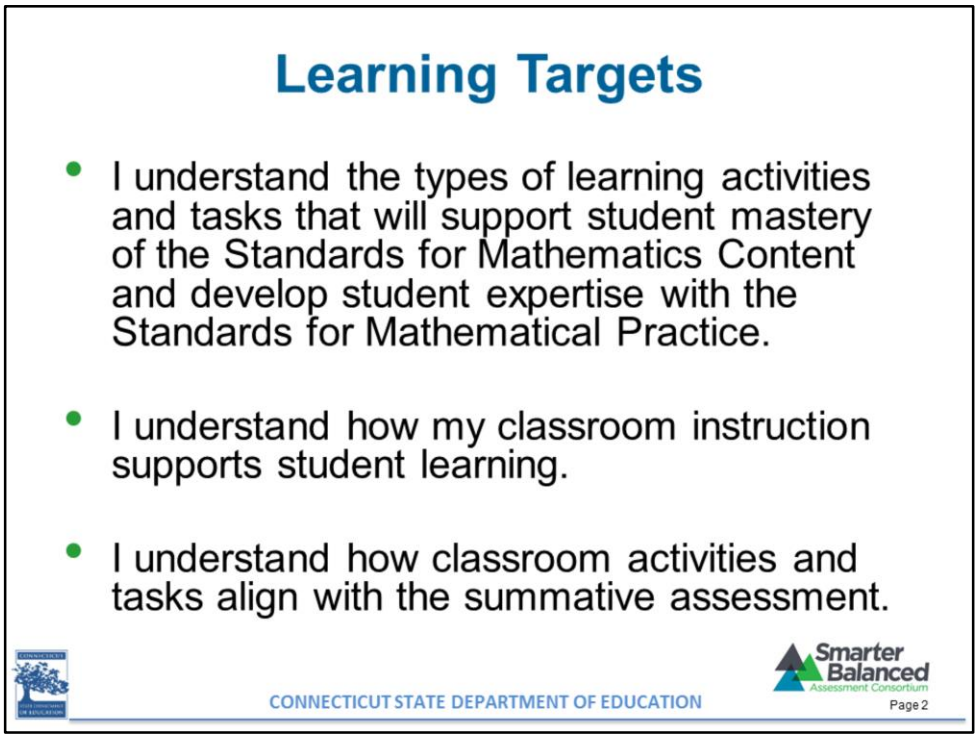


Note: Each participant will receive a copy of the K-12 Mathematics *Common Core Standards* flip book as well as the *Principles to Actions* e-book as long as the assurance form is completed.



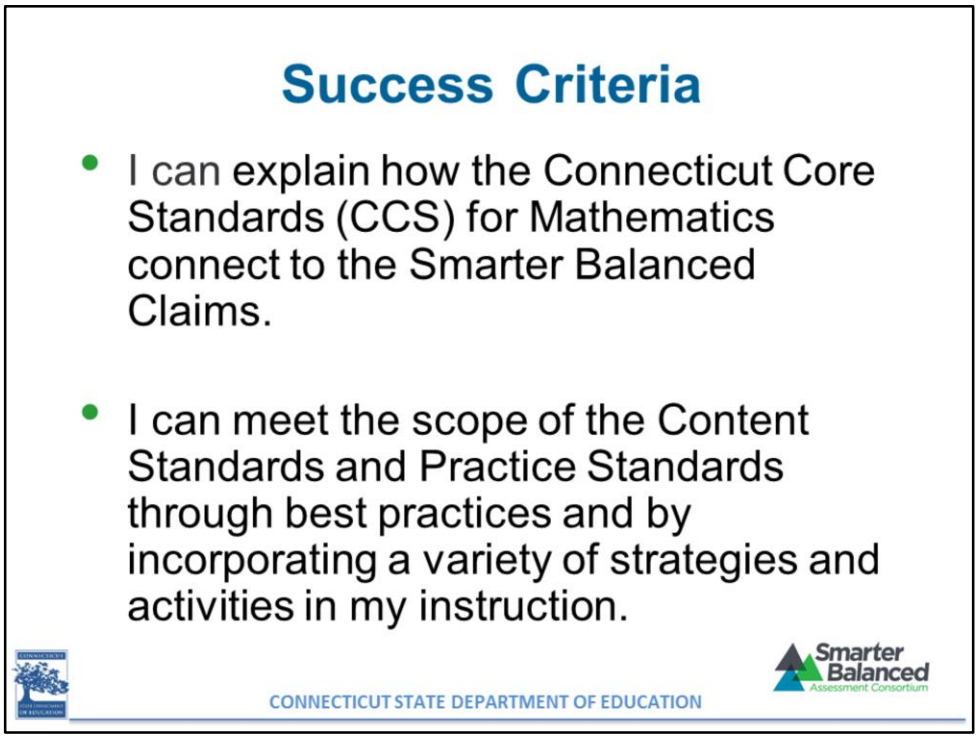
These learning targets should be posted on chart paper for the duration of the workshop.

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.

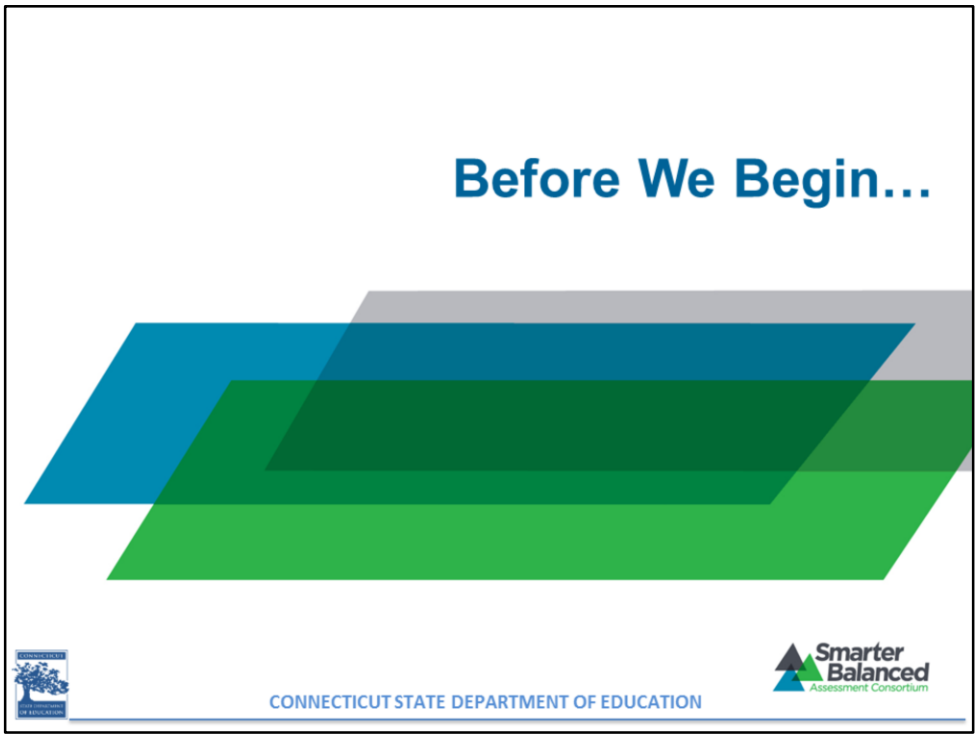
With this in mind, the three learning targets stated on this slide inform participants of the learning goals based on the scope of this half-day presentation.

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.

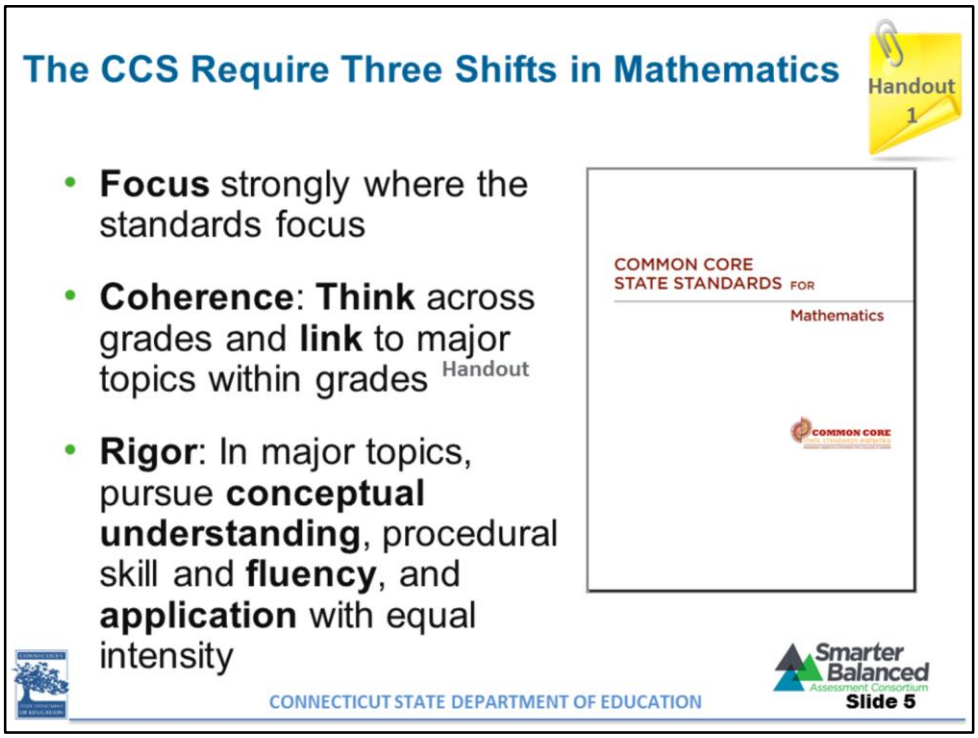


When presenting this slide, inform participants that these two bullet point frame the scope of learning for this presentation. The success criteria are the Learning Targets written in a student-friendly way, often are posted beginning with the works "I CAN..." indicators that the teacher and the students 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.



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.



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

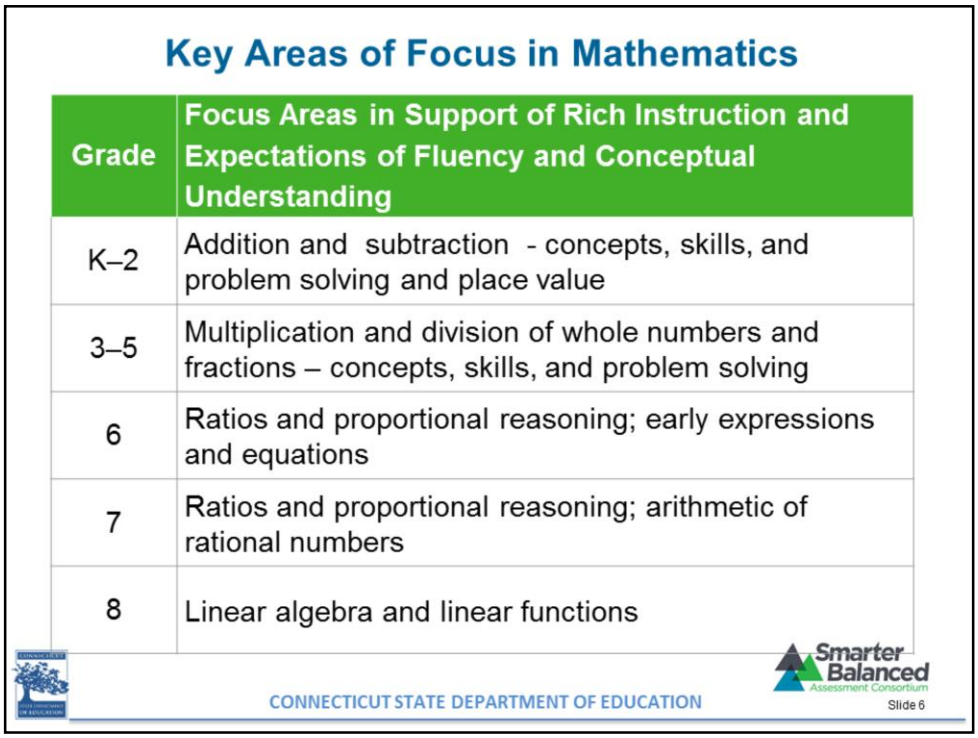
2) Coherence: think across grades, and link to major topics within grades

- **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-

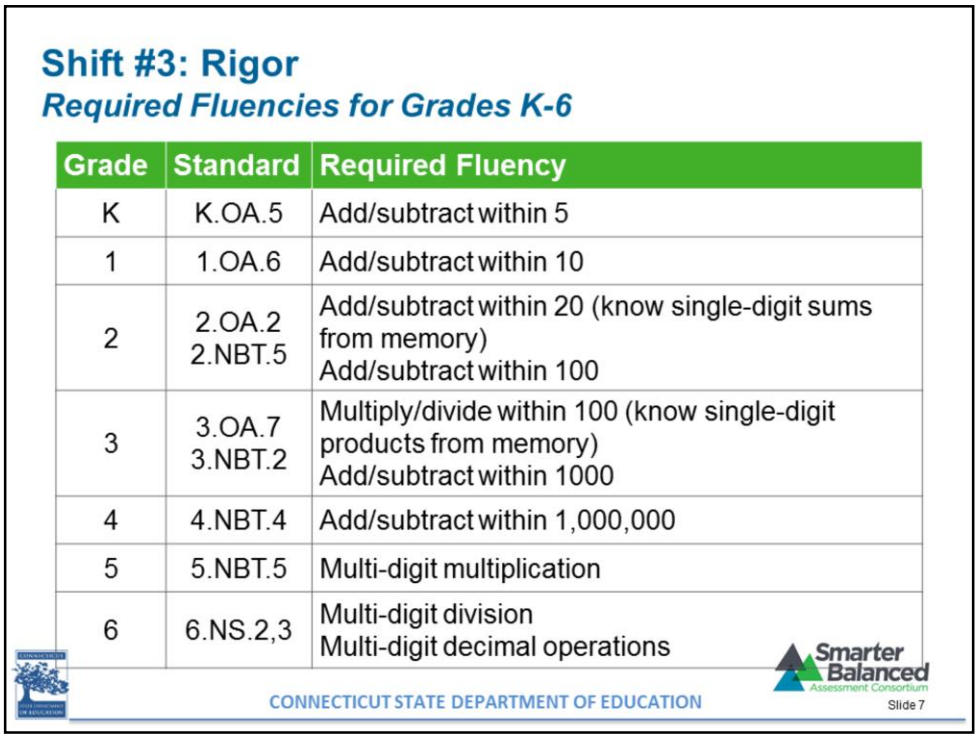
- **Conceptual understanding:**
  - The Standards call for conceptual understanding of key concepts
  - Students should see math as more than a set of mnemonics or discrete procedures
- **Procedural skill and fluency:**
  - The Standards call for speed and accuracy in calculation.
  - Providing instruction 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.



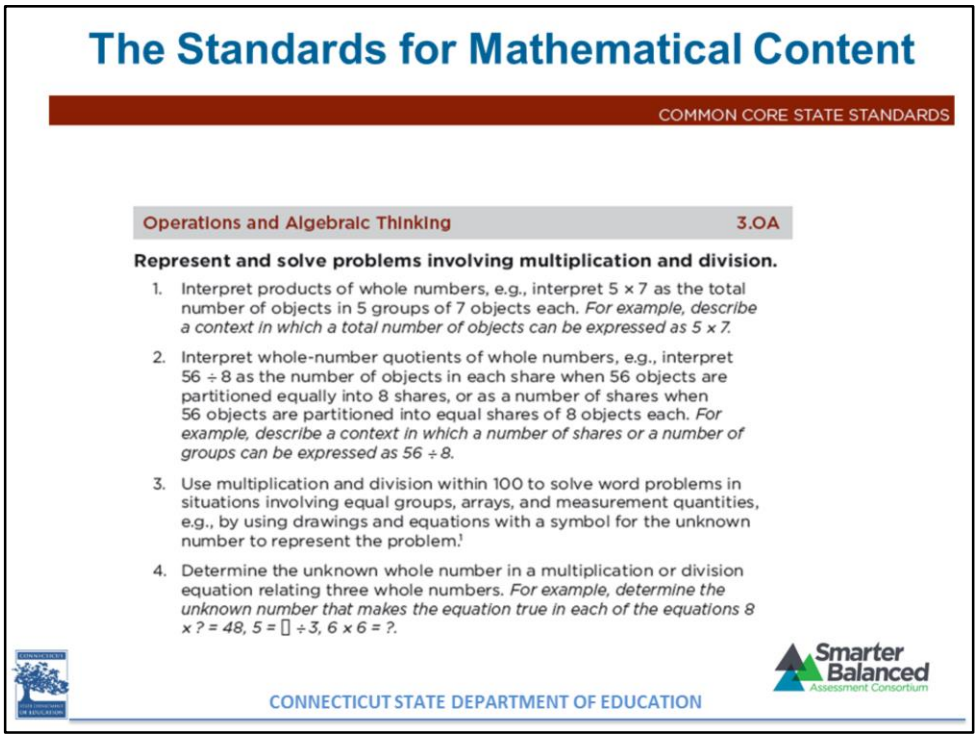
Shift #1 references "the major work'" of the grade. The key areas of focus in mathematics are described by grade band. (Read the grade-band key areas of focus from slide)

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.



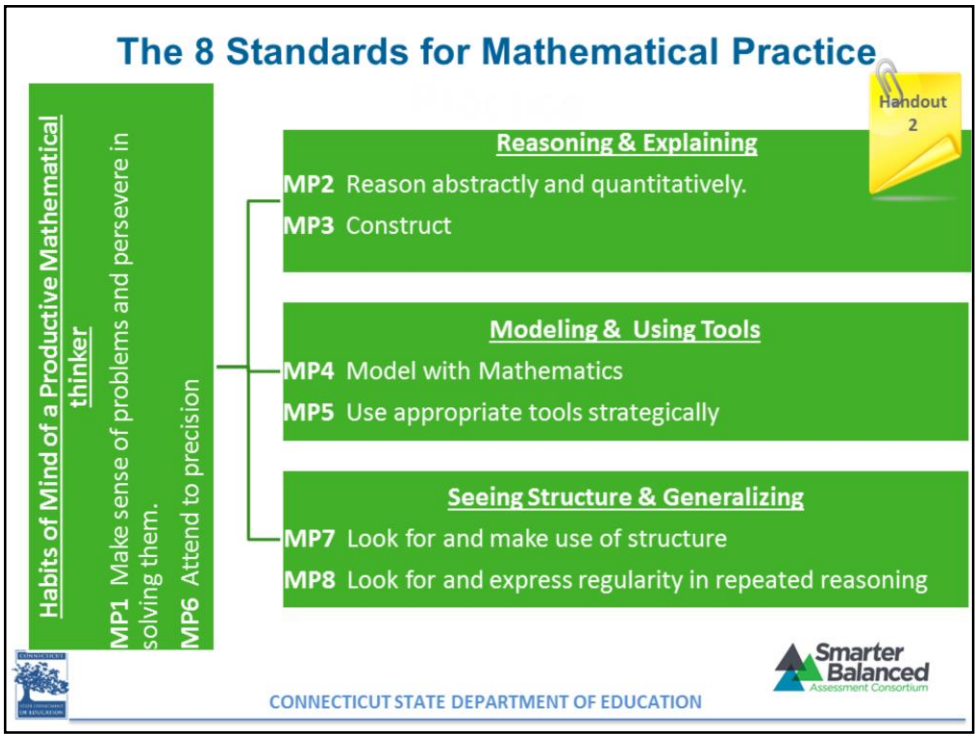
Shift #3 references required fluencies for Grades K-6.

- 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.



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.



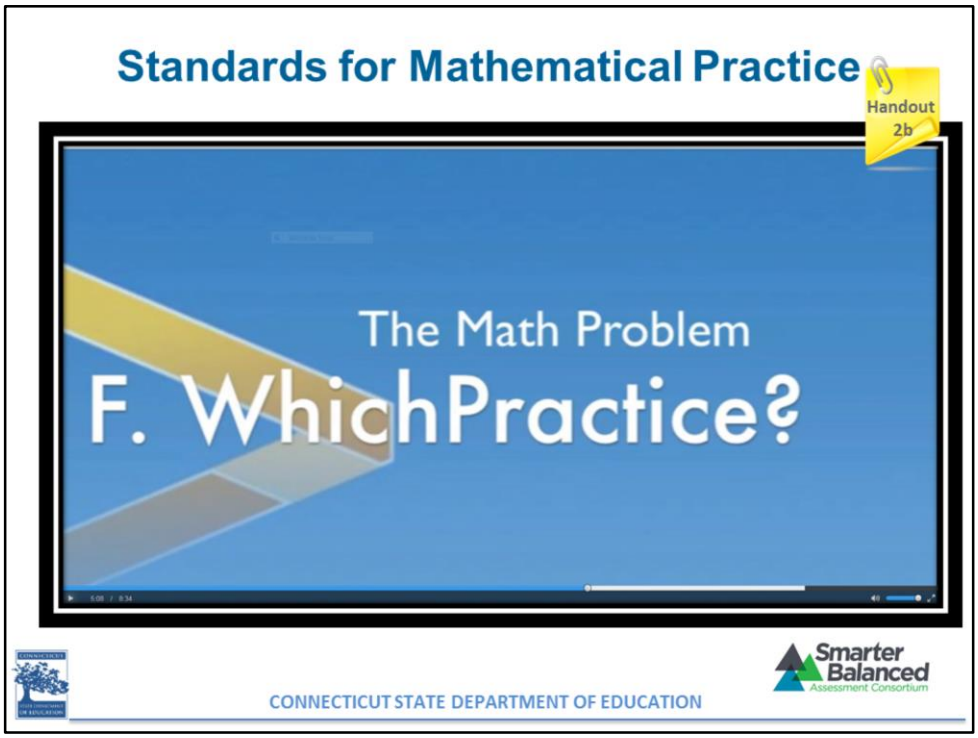
This is an overview of the 8 Standards for Mathematical Practice. This template was created by Dr. Bill McCallum, lead head writer of the CCSS mathematics.
Remind participants that these eight Standards for Mathematical Practice (SMP) describe expertise that every teacher of mathematics should strive 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.

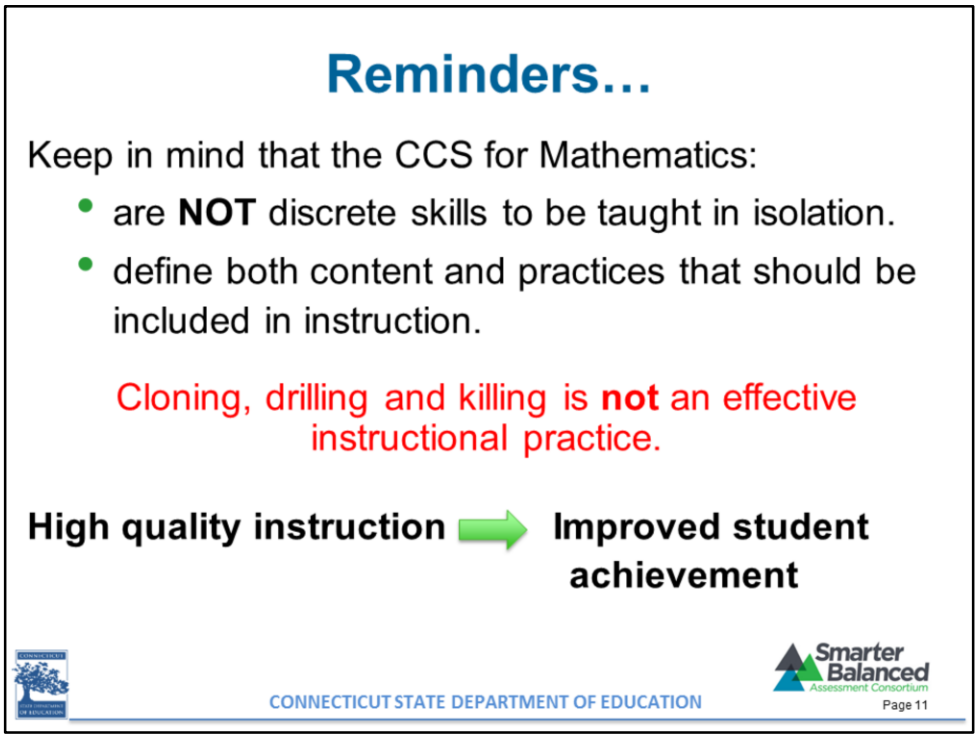
The mathematically proficient student should have such a well-grounded understanding of how to employ the Standards for Mathematical Practice that they become Habits of Mind.

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.



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.



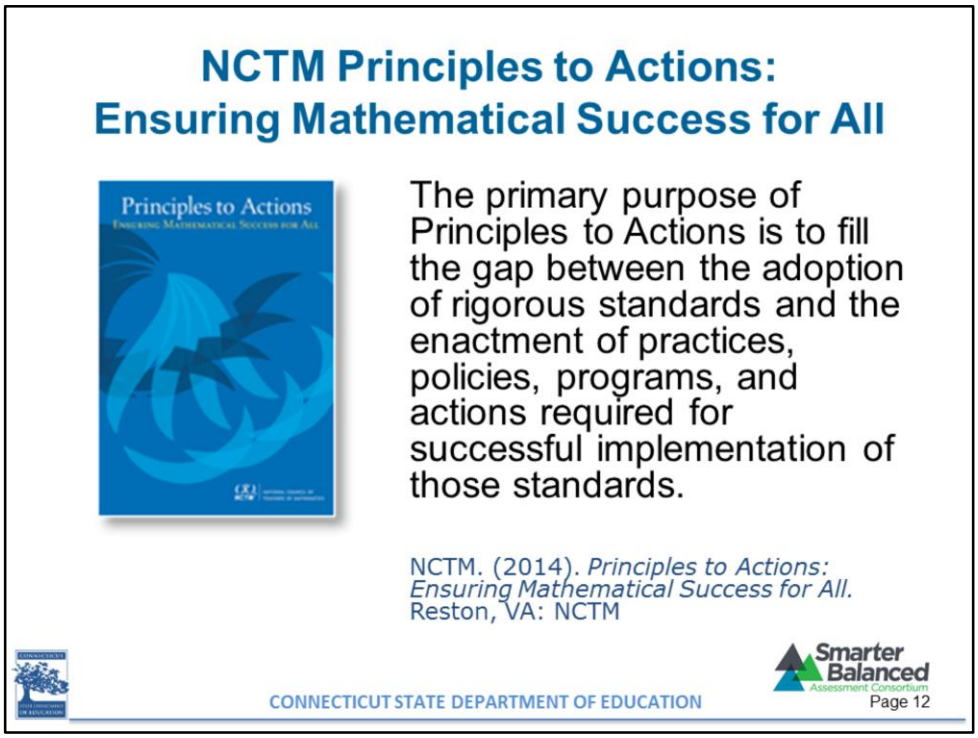
This presentation is **not** about starting with a standardized test and trying to figure out how to prepare your students. Cloning, drilling and killing is **not** an effective instructional practice.
This presentation will focus on how the CCS Standards for Mathematical Content, Standards for Mathematical 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.

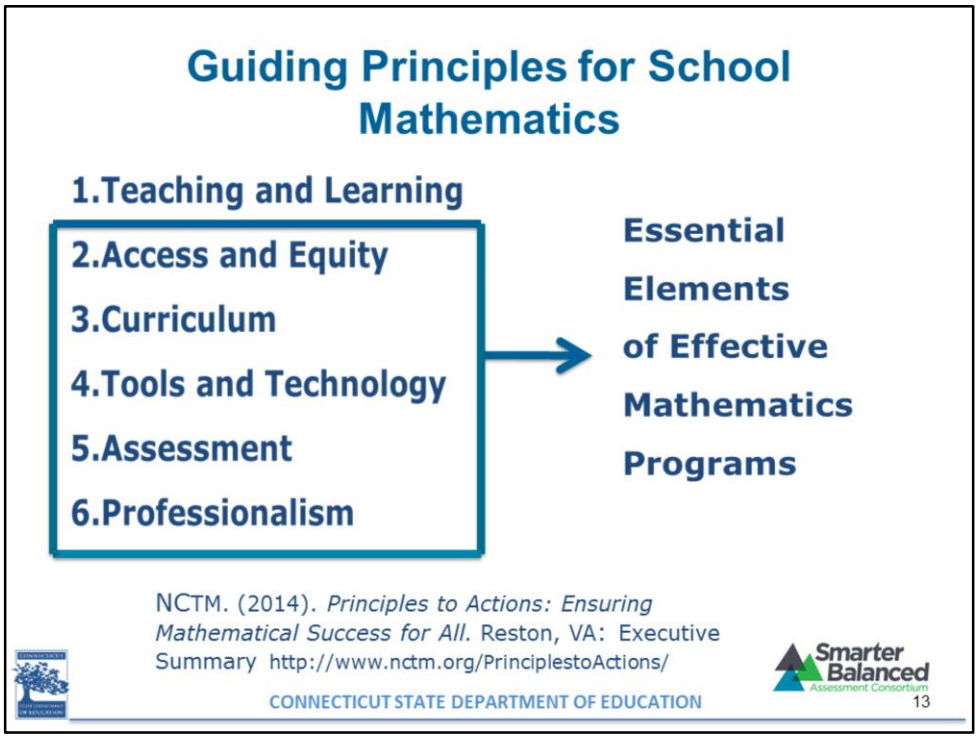
Much of this may be validating. You may see many of the best practices you are already using in your classroom. We hope to show you multiple pathways to integrating the standards into your instruction. By the end of this presentation, we will specifically connect how these instructional practices connect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



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)



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.

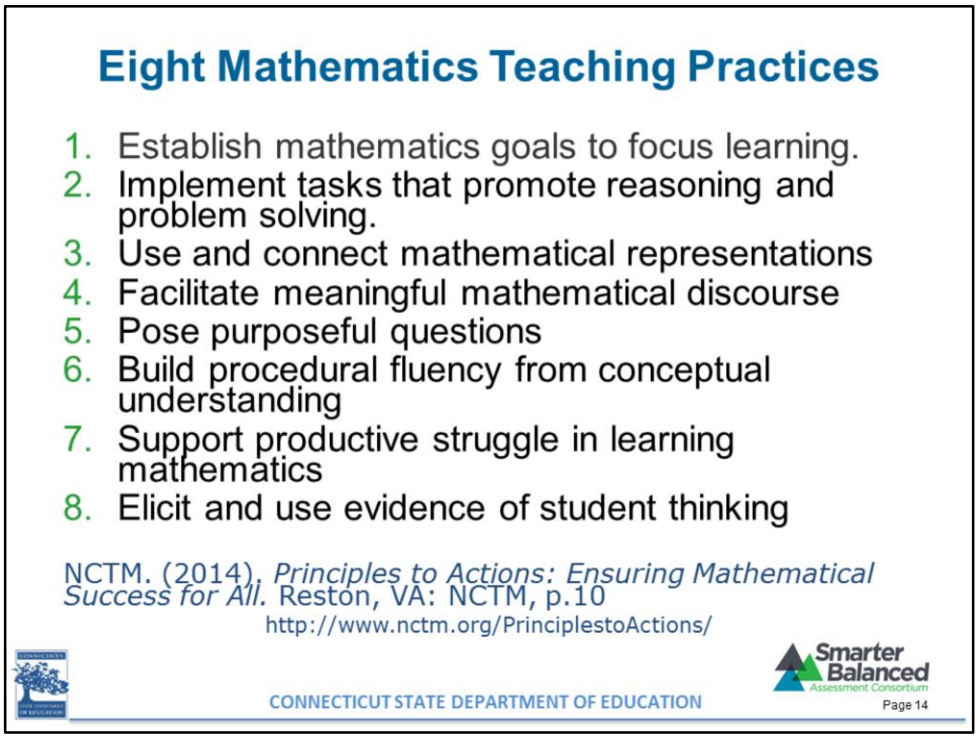
Three aspects of Principles to Actions are new, provocative, and important.

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.



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

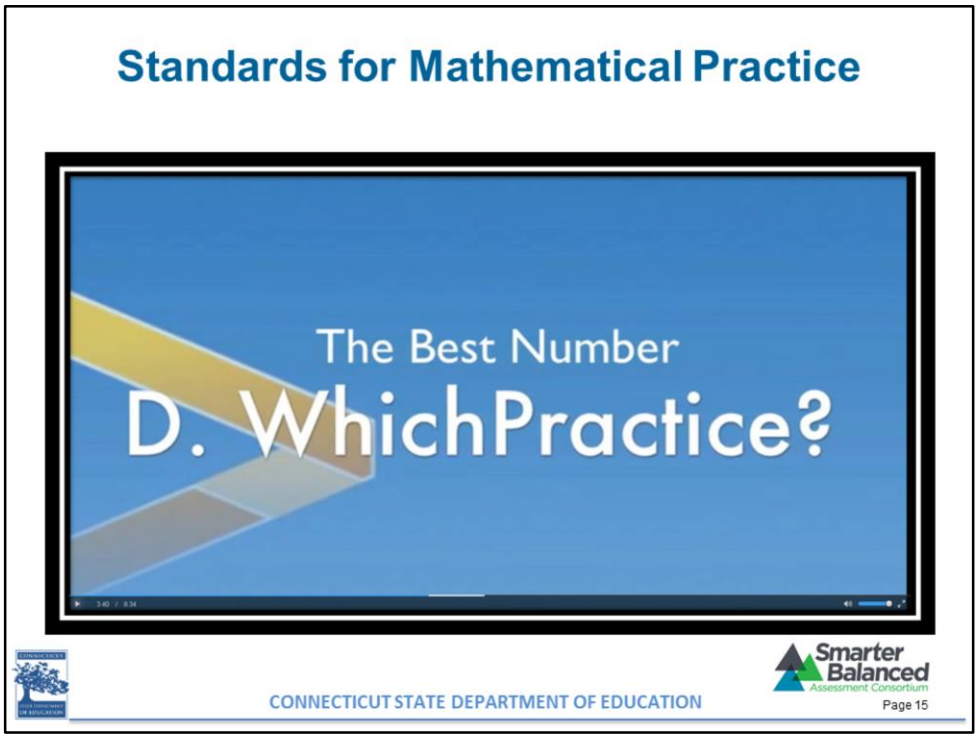
This research-informed framework reflects learning principles and knowledge of mathematics teaching that has accumulated over the last two decades.

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.

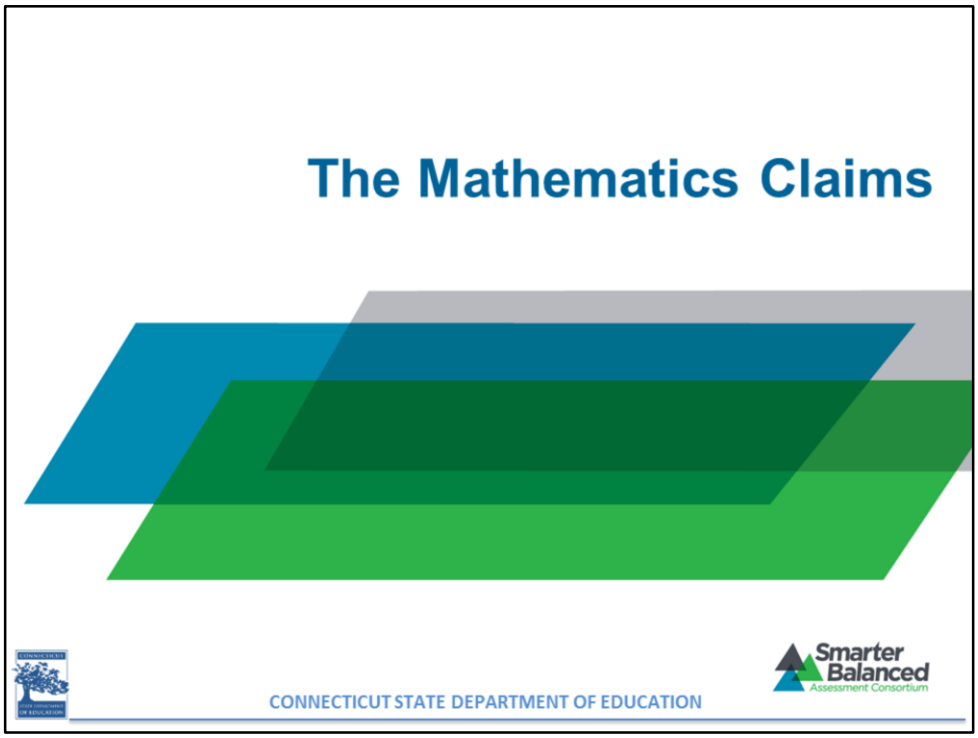
The eight practices are… (read from slide).

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.

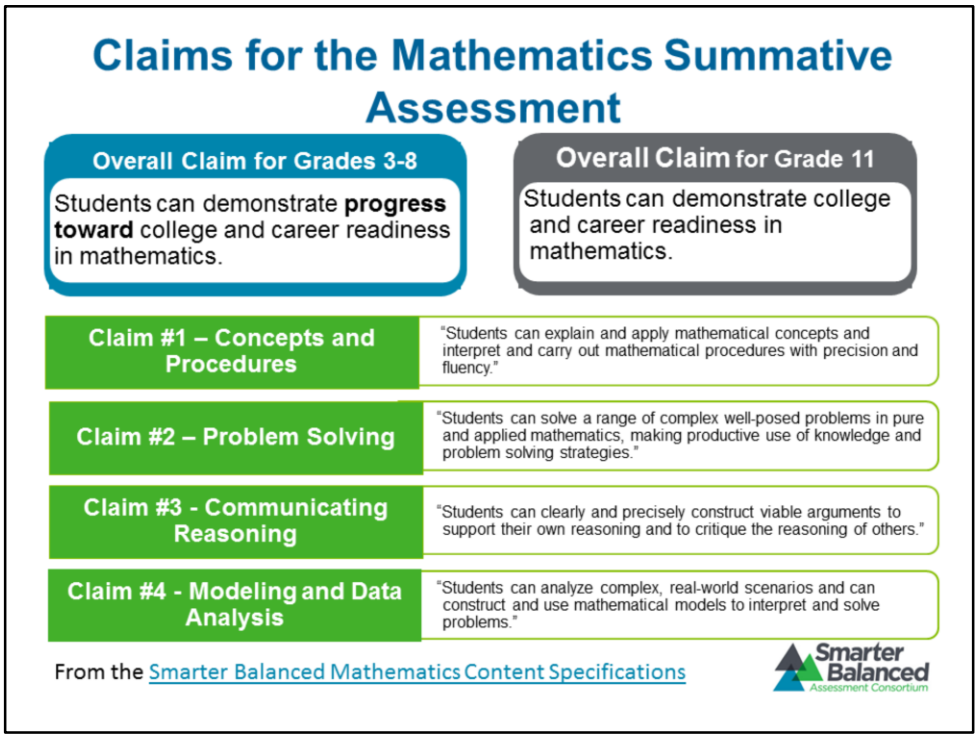


https://www.dropbox.com/s/0xquhbcx9nwj8k8/Math%20Practice%20Standards.mov
Video from Debbie Waggoner's site-http://www.debbiewaggoner.com/math-practice-standards.html . "Going Deeper" with Big Bang Theory.
Advance the Big Bang Theory videos to marker 3:39 for this clip which ends at 4:28.

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



The 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.



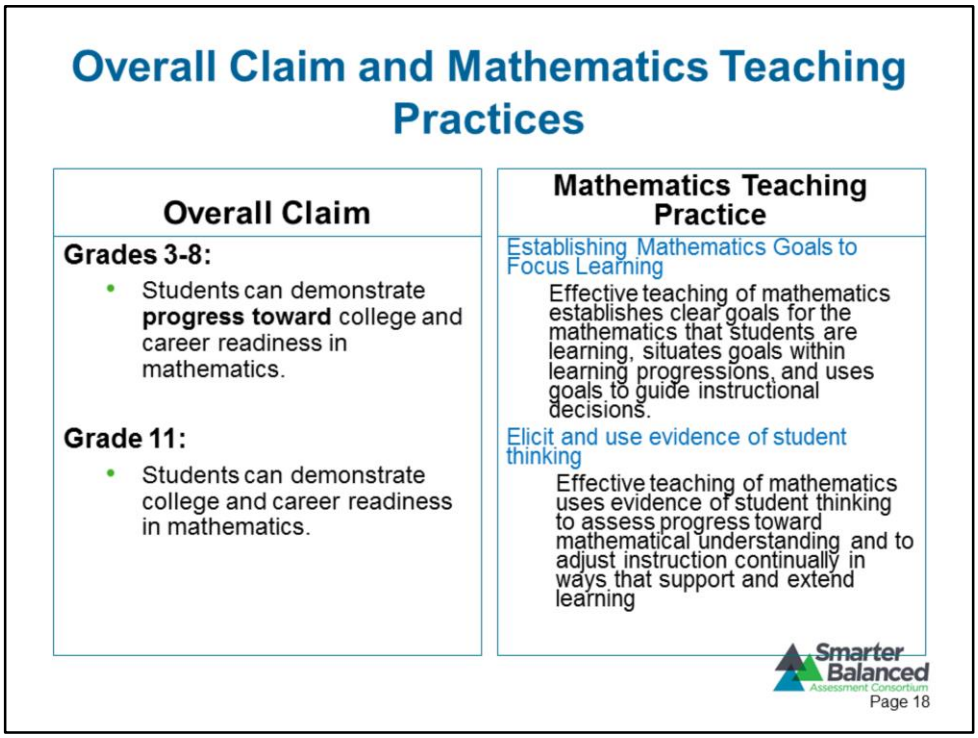
The Overall Claims are specific to grades 3-8 (progressing towards college and career readiness) and grade 11 (demonstrate college and career readiness). The claims are summary statements about the knowledge and skills students will be expected to demonstrate on the assessment related to a particular 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.



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.

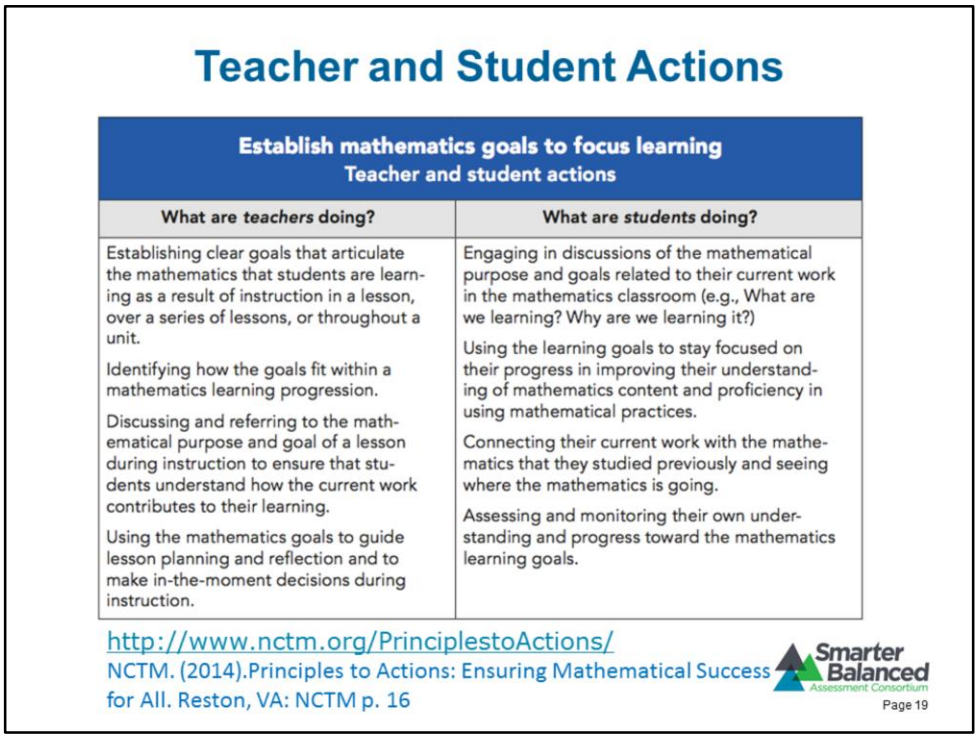
By engaging in a shared understanding among teachers of the mathematics that students are learning and how this mathematics develops along the learning progressions, both prior learning and where it is going, teachers are better able to make decisions to guide instruction .

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.

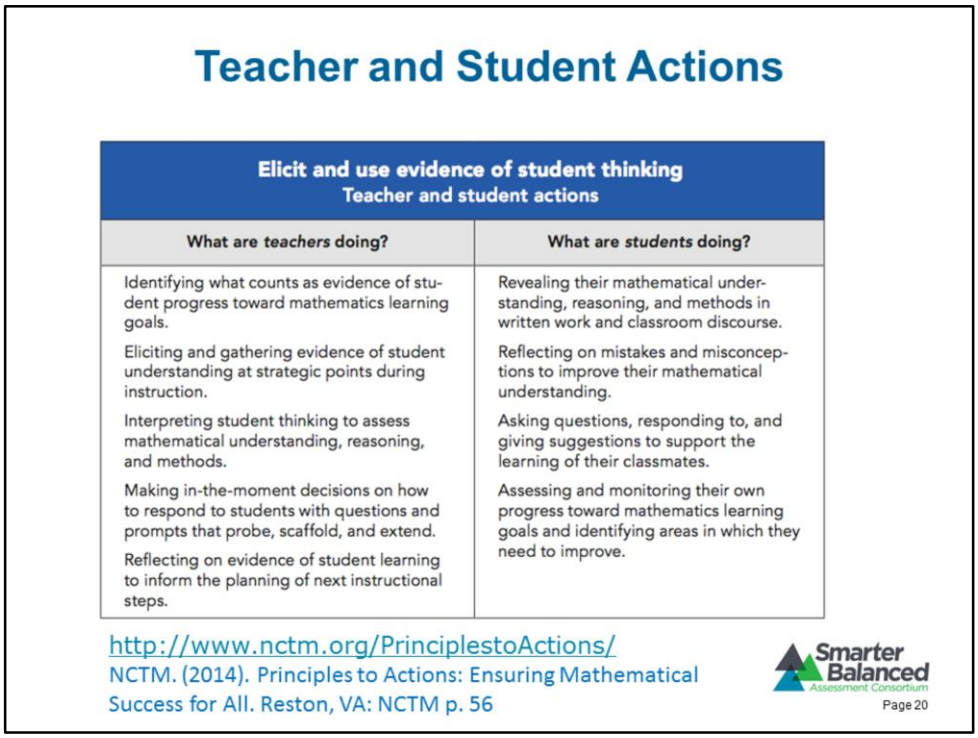
From Principles to Action, page 53:
"The gathering of evidence of student thinking should neither be left to chance nor occur sporadically. Preparation of each lesson needs to include intentional and systematic plans to elicit evidence that will provide "a constant steam of information

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



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.

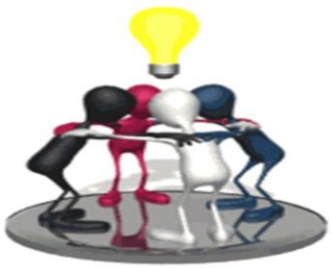
Note for participants that each of the Mathematics Teaching Practices (MTP) is presented in this manner of illustrating teacher and student actions in *Principles to Actions.* Also note the connection to the 2014 CCT rubric. The evidence to support the indicators and attributes of the CCT are directly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



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

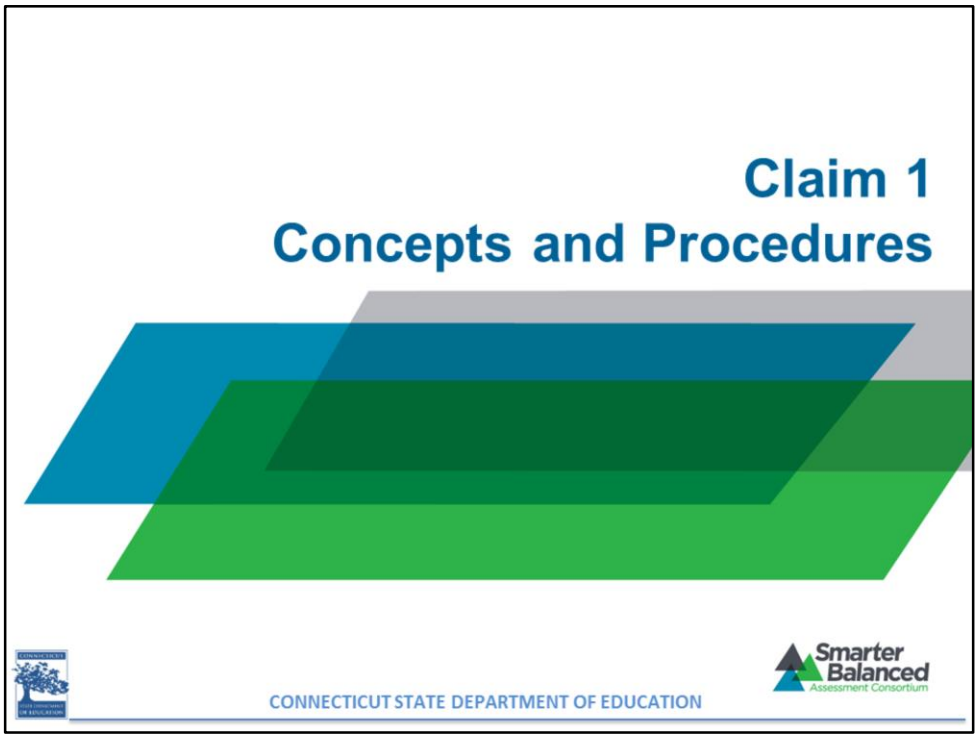
- Standards for Mathematical Practice
- Smarter Balanced Claims
- Mathematics Teaching Practices



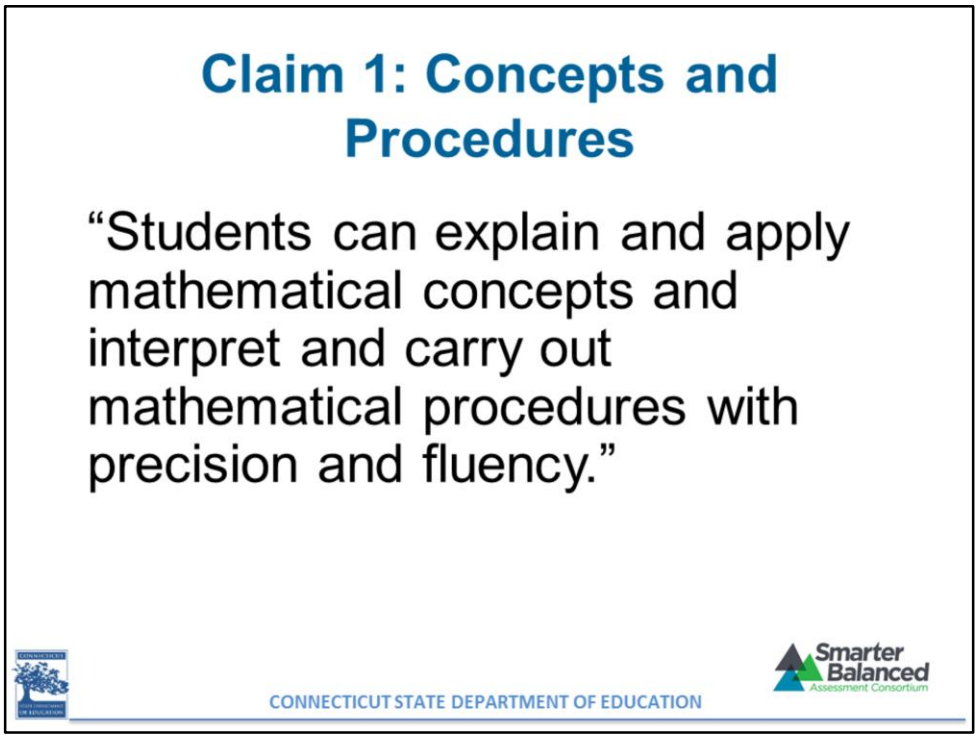
Smarter Balanced Assessment Consortium

Page 21

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/ .



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.

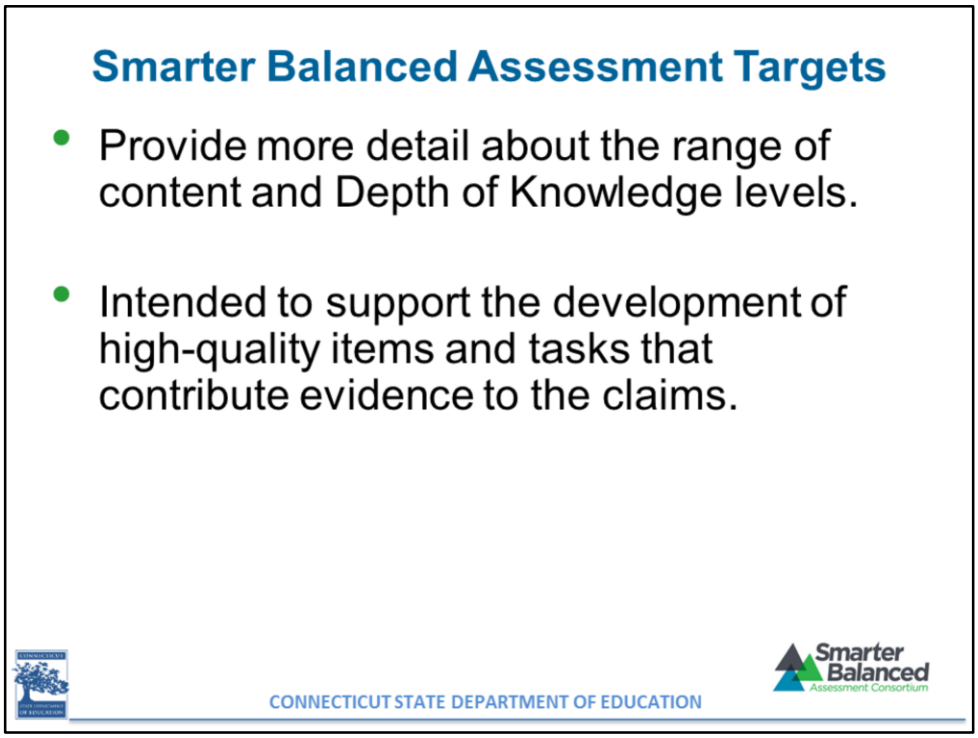


Claim 1 items measure the extent to which students are able to explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

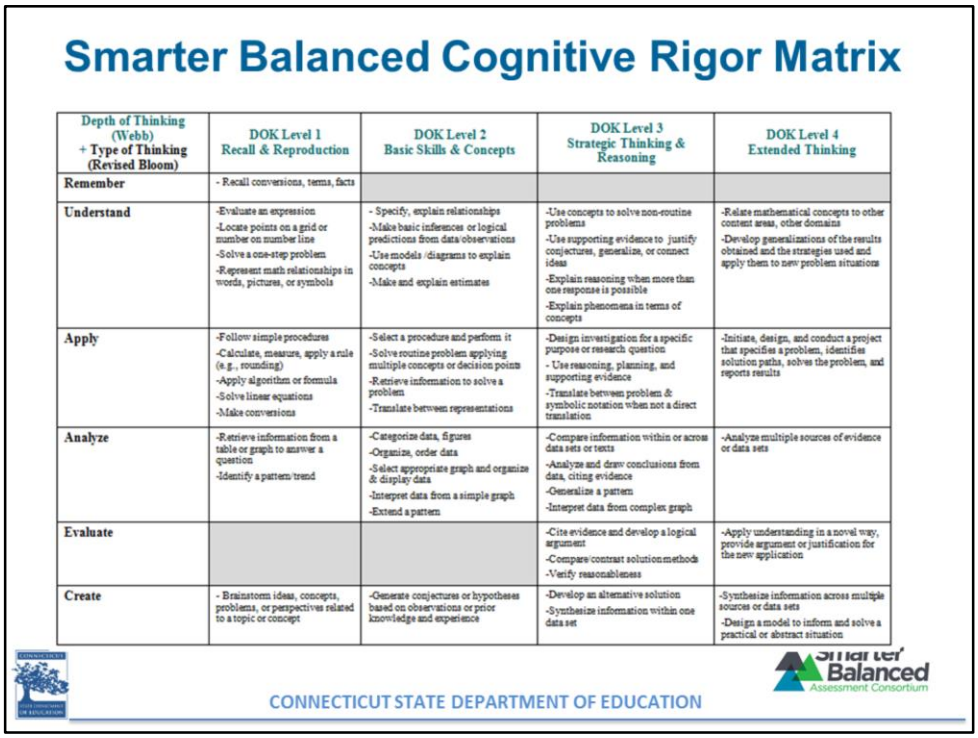
Central to understanding this claim is making the connection to these elements of the mathematical practices as stated in the CCS for Mathematics.

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.

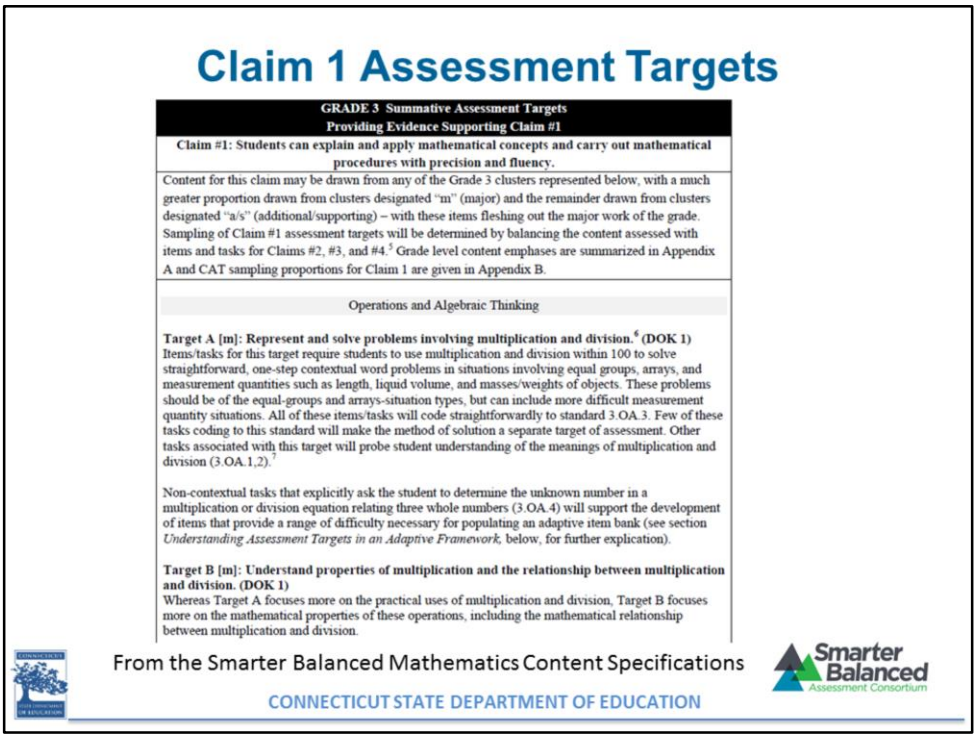


Each Claim is accompanied by a set of assessment targets that provide more detail about the range of content and Depth of Knowledge levels. The targets are intended to support the development of high-quality items and tasks that contribute evidence to the claims.
(to determine the level of student understanding)



Smarter Balanced 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

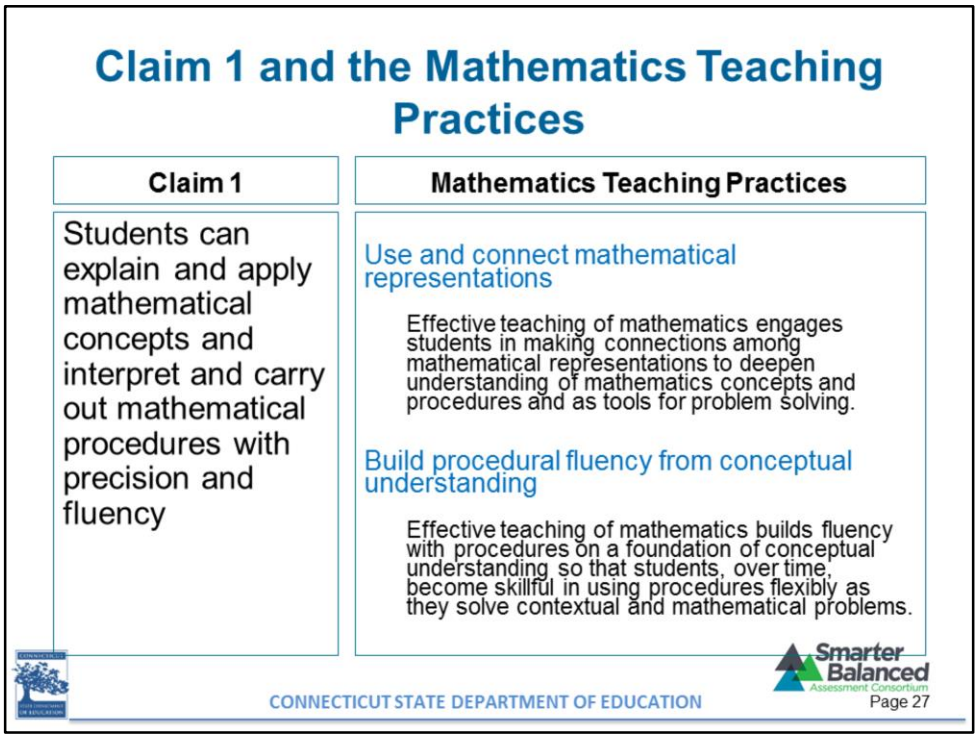


As outlined in the Smarter Balanced Mathematics Content Specifications, the Claim 1 Assessment Targets provide more detail about the range of content and Depth of Knowledge levels that are assessed in Claim 1.

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.



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.

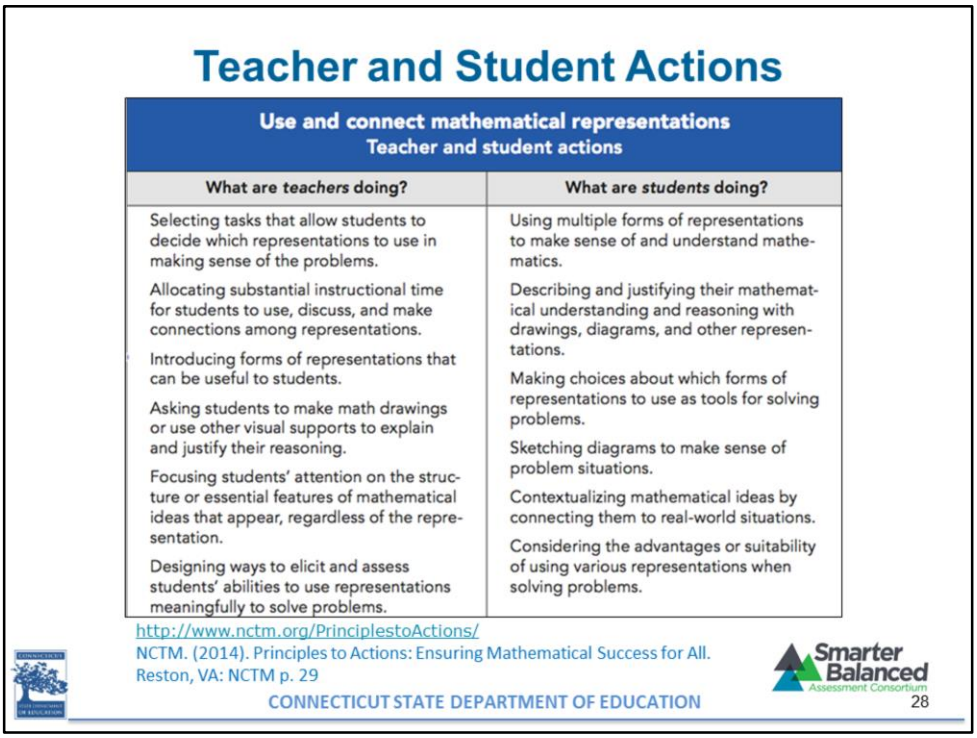
Likewise, when teachers employ the practice of building procedural fluency from conceptual understanding, students, over time, will become skillful in using procedures flexibly as they solve contextual and mathematical problems.

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.

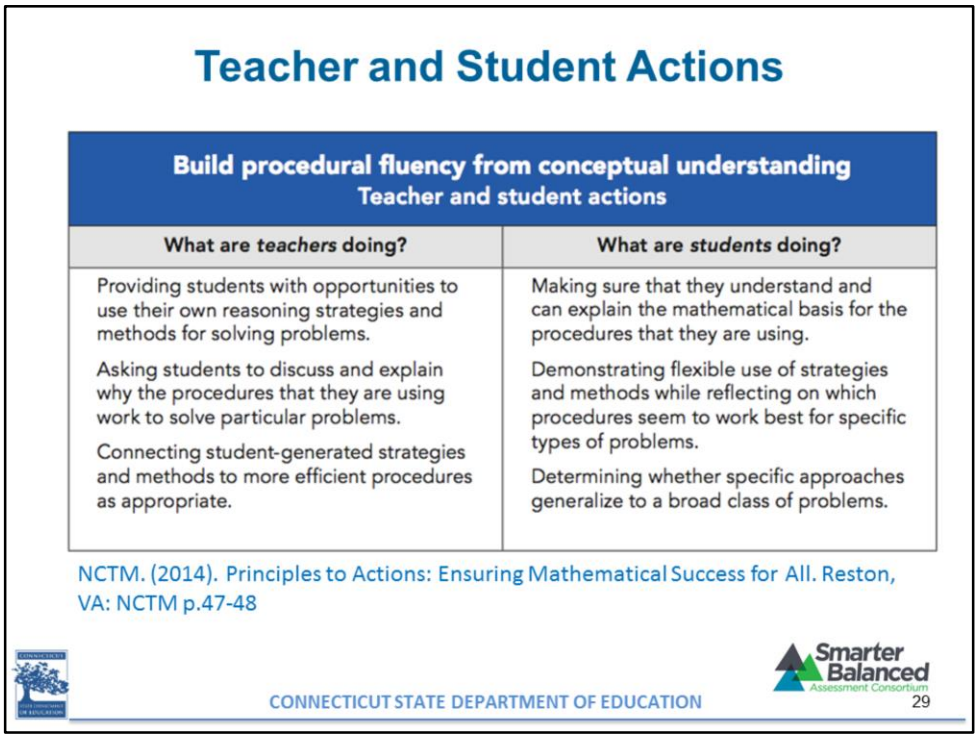
At the same time, we can't expect fluency to be a natural outcome without addressing

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

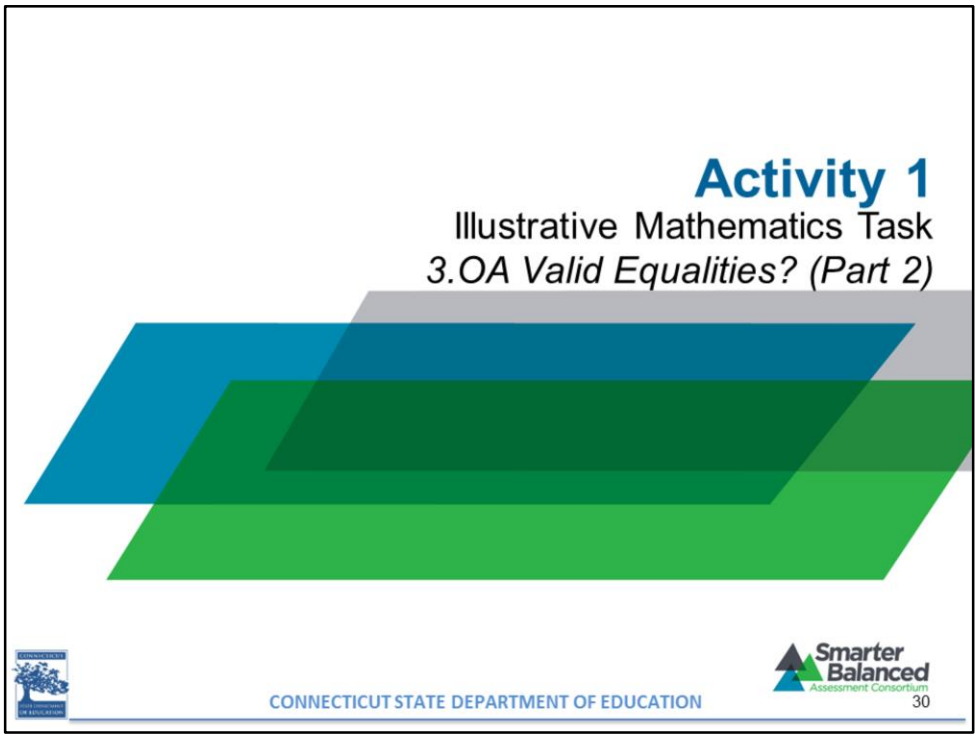
Additionally, there is not one approach to get to speed and accuracy that will work for all students. All students, however, will need to develop a way to get there.



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.



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.

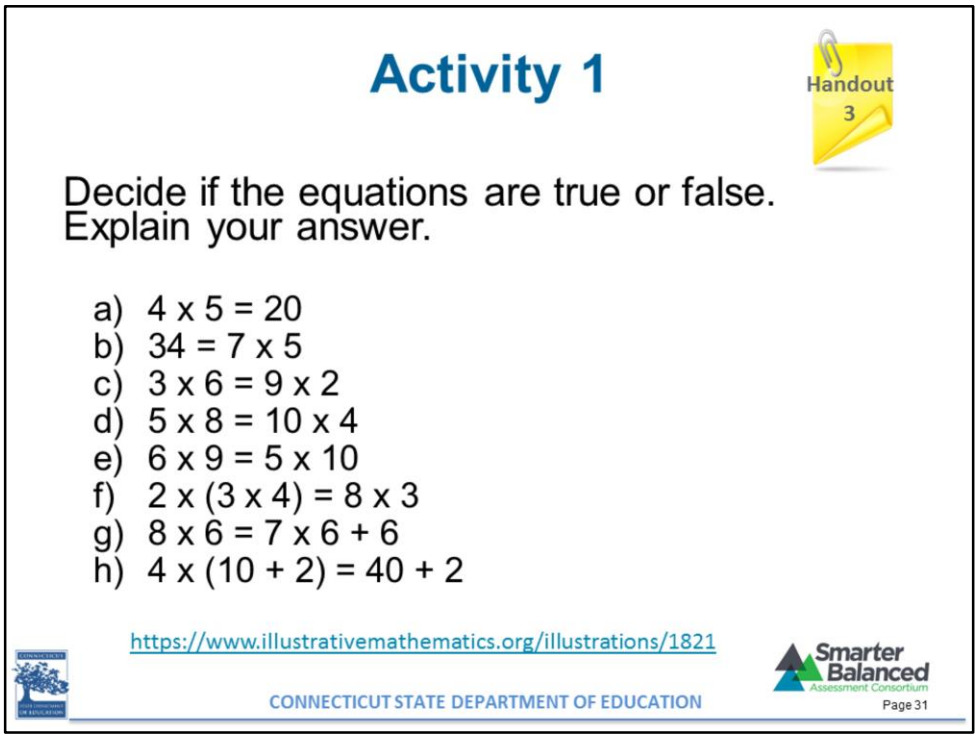


We will now work on a task that addresses build procedural fluency from conceptual understanding.

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.



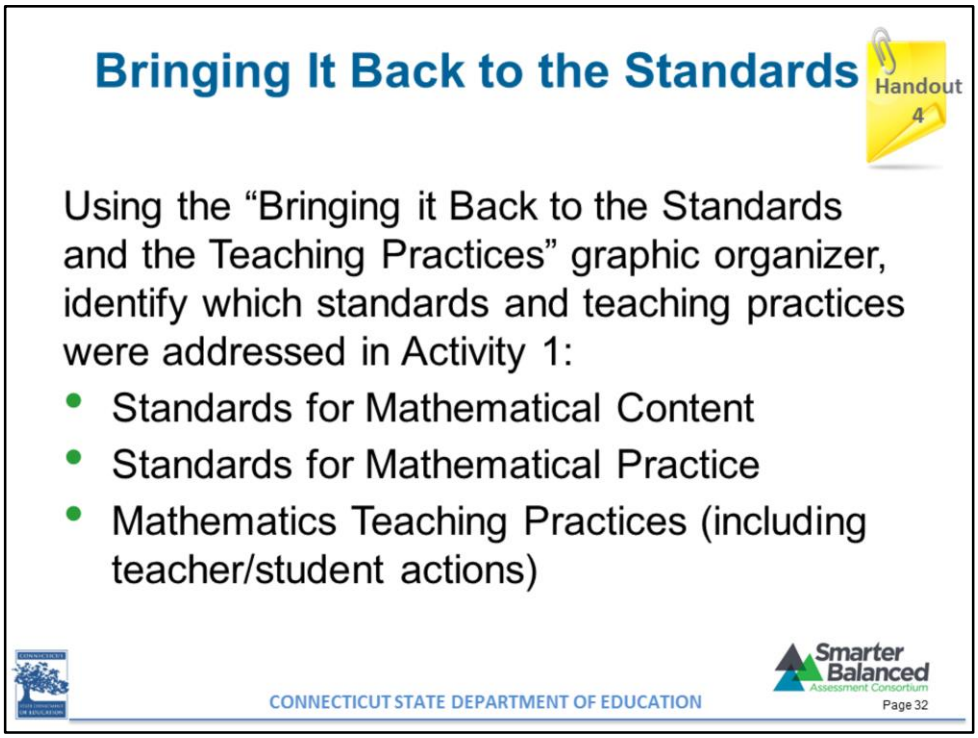
Facilitator Note: Direct participants to use Handout 3 for this activity. Ask participants to work through each question without looking at the solutions on page 2 of the handout. Once finished, they should read the solutions on page 2 and compare them to the explanations they provided.

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 6×4=24 is known, then 4×6=24 is also known. (Commutative property of multiplication.) 3×5×2 can be found by 3×5=15, then

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



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 an 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.**

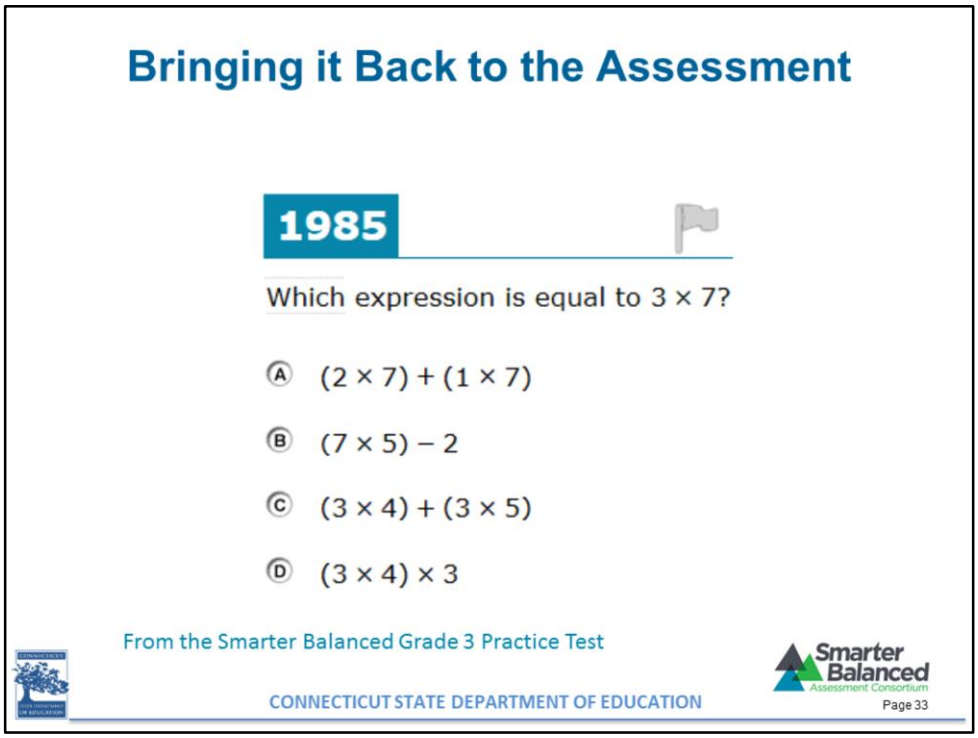
8 **Look for and express regularity in repeated reasoning.**

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."

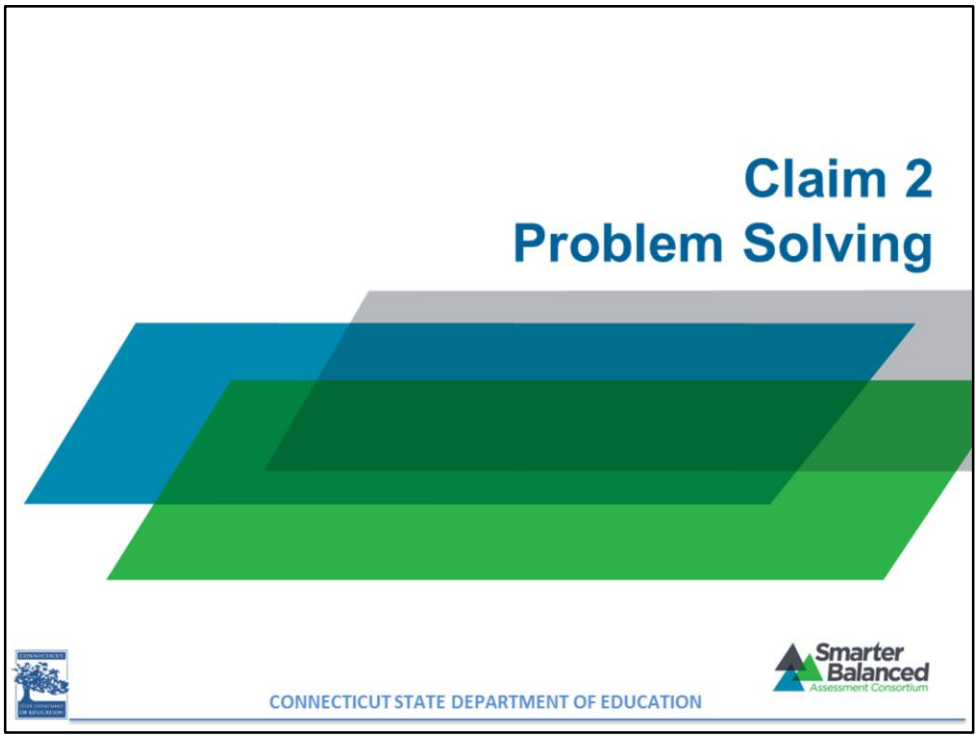
This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.



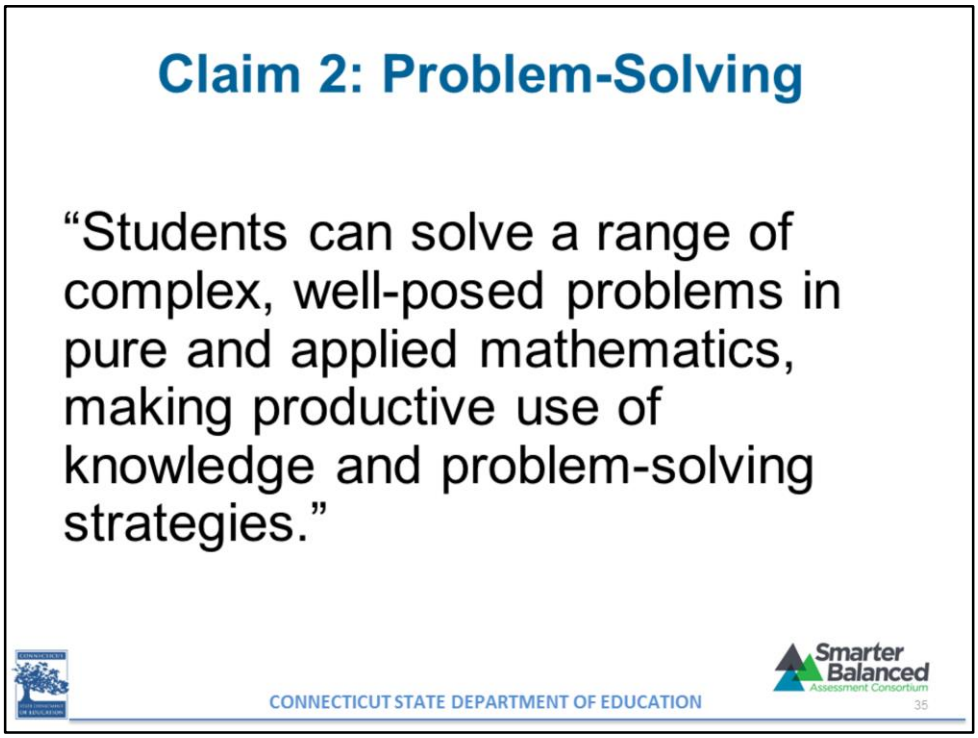
This item is from the Smarter Balanced Grade 3 Practice Test. It is a Claim 1 item aligned to Operations and Algebraic Thinking Target B "Understand properties of multiplication and the relationship between multiplication and division." Note that this is the cluster heading from the CCS.

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.

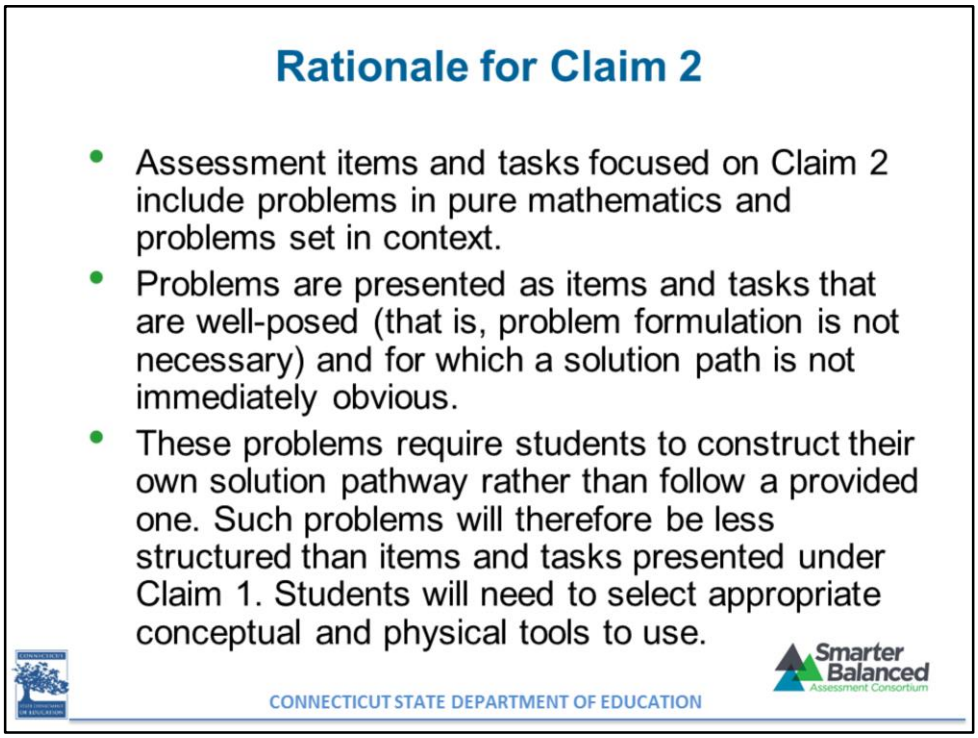


Let's move on to Claim 2: Problem Solving



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.

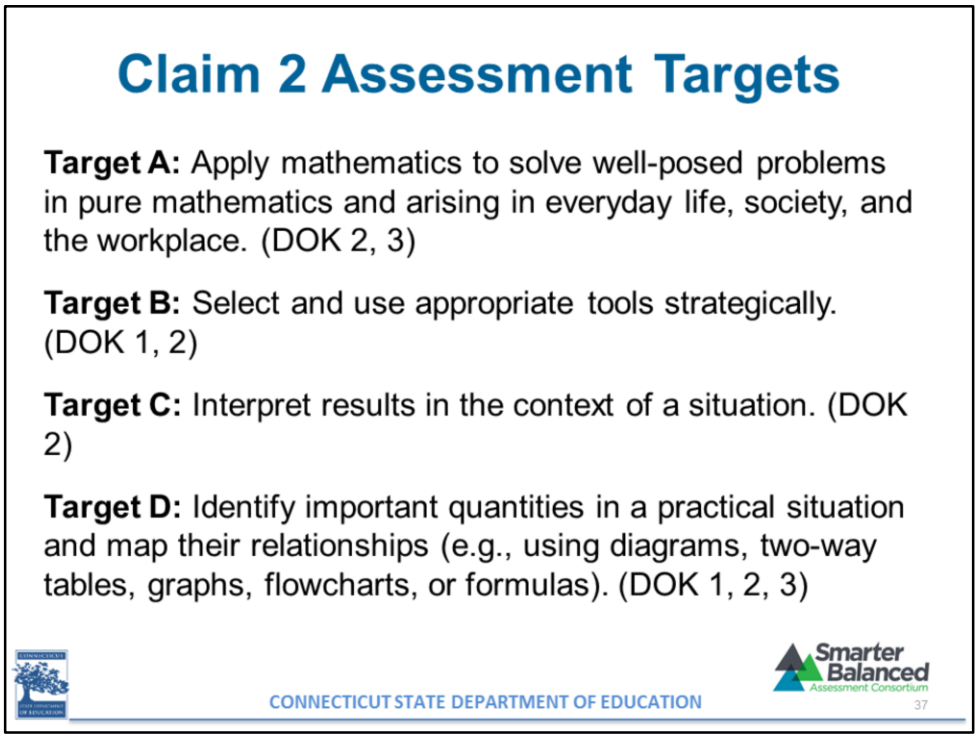
Keep in mind that not all word problems are Claim 2. Word problems that are procedural are tagged to Claim 1.
Though not exclusive, MP1, MP5, MP7, and MP8 are particularly relevant for Claim 2 items.



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

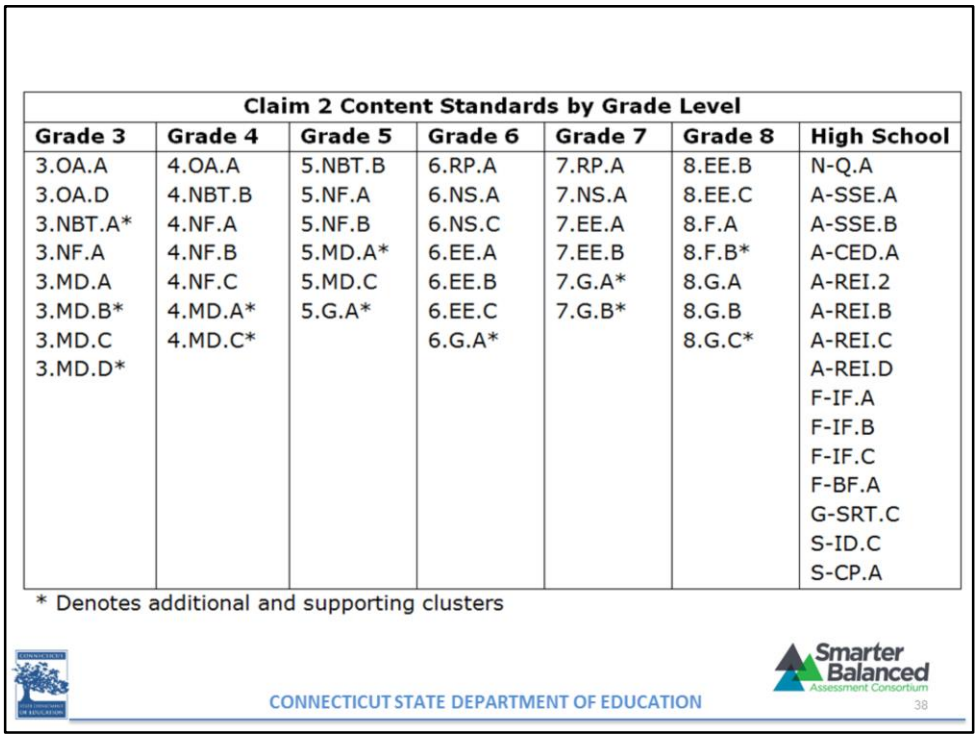
As opposed to problems tagged to Claim 4, Claim 2 items are well posed, meaning that the students are **not** required to formulate a model to solve the problem, however, the solution path should not be obvious (this is Claim 1).
Tell participants to refer to Handout 2 that describes the student behaviors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



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

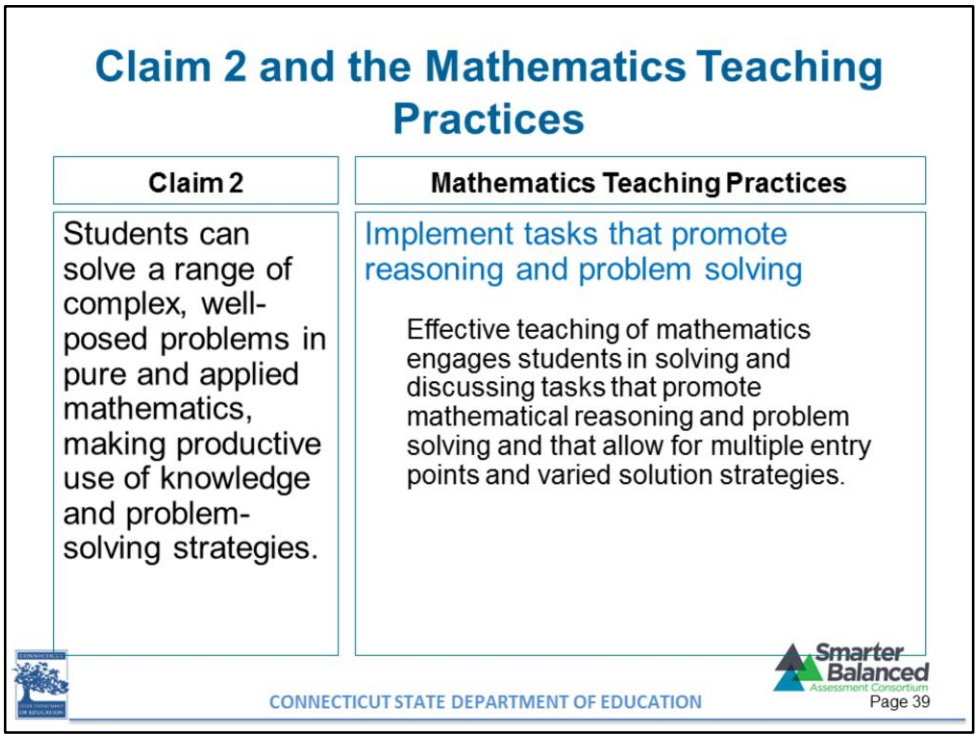
As you can see, the language of the targets are drawn from the Standards for Mathematical Practice.



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

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.

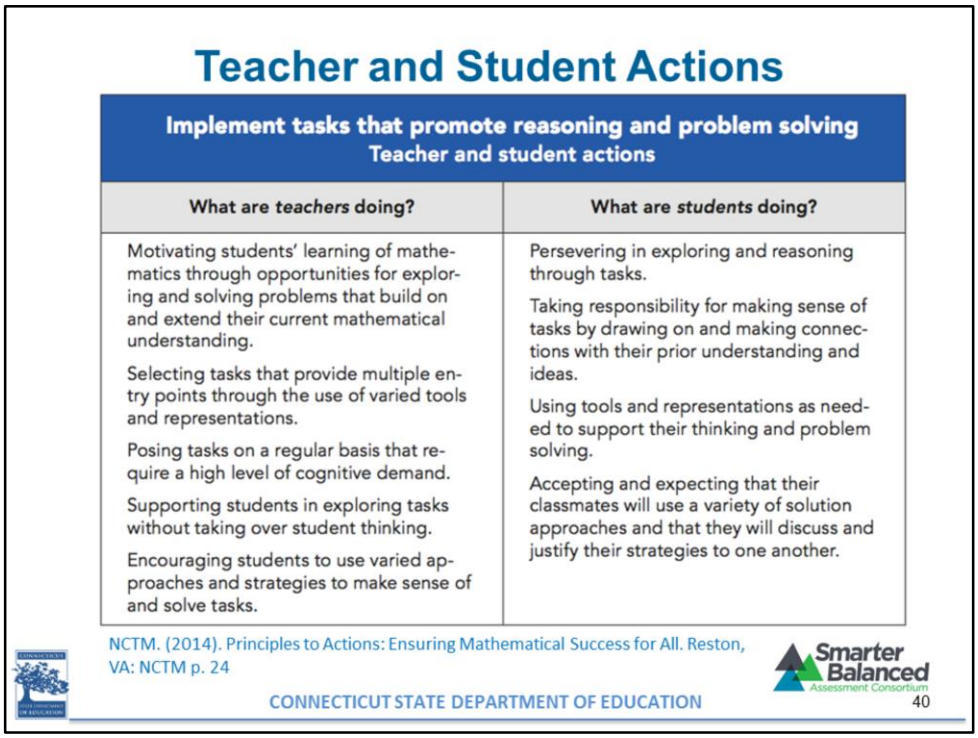
This information is provided in the Smarter Balanced Mathematics Content Specifications.



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."

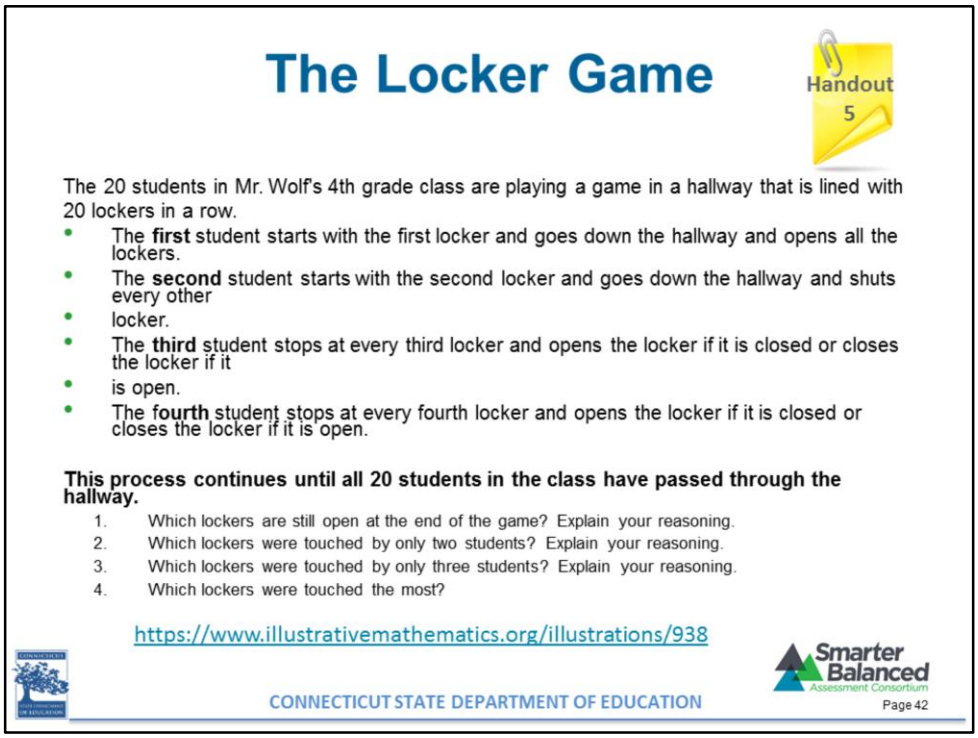


The actions listed in this table provide a summary of what teachers and students need to do when implementing tasks that promote reasoning and problem solving in the mathematics classroom.

Activity 2

The Locker Game and The Very Hungry Caterpillar

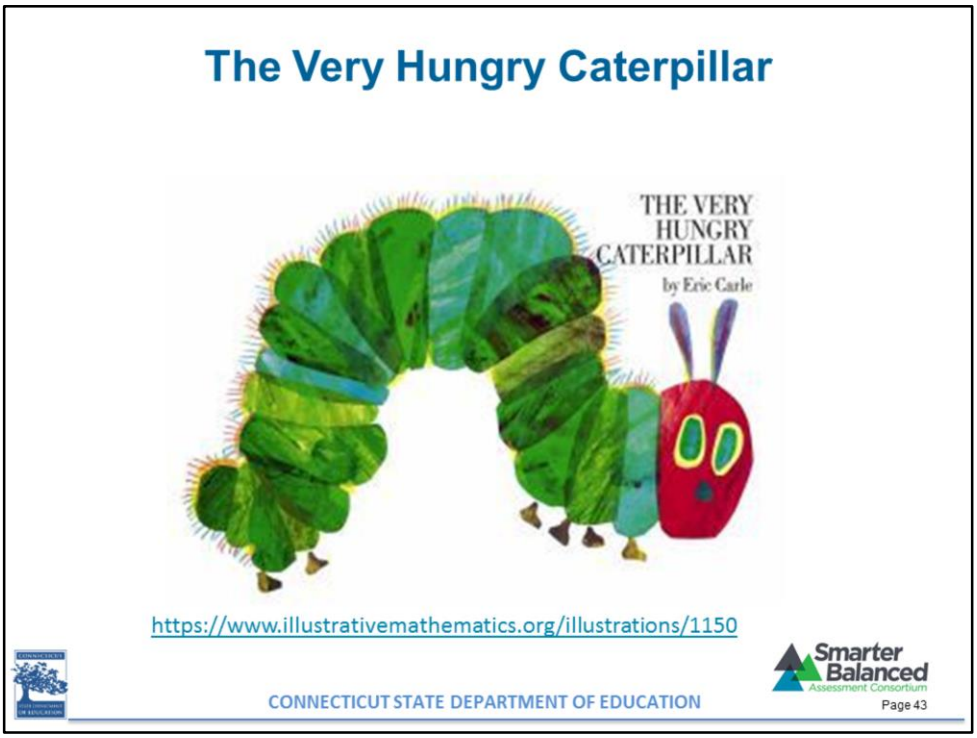
Illustrative Mathematics



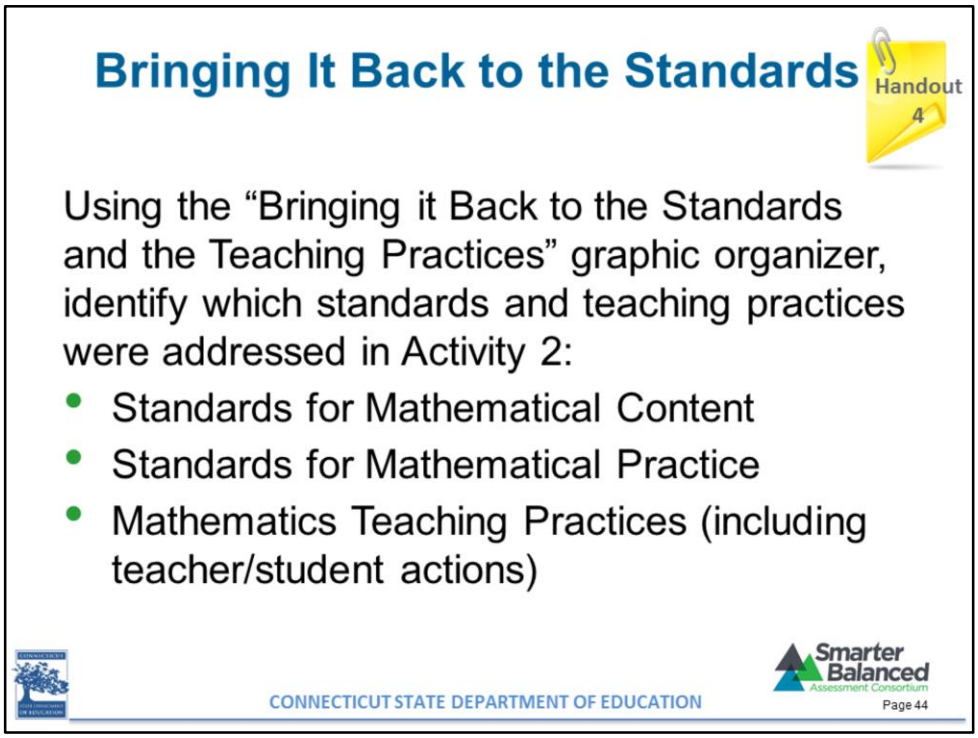
Facilitator Note: There are two different tasks here. Choose either The Locker Game or The Very Hungry Caterpillar. Copies of the book should still be in the library of each RESC. They were provided when the last K-5 Mathematics Model Curriculum was rolled out.

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

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



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.



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.
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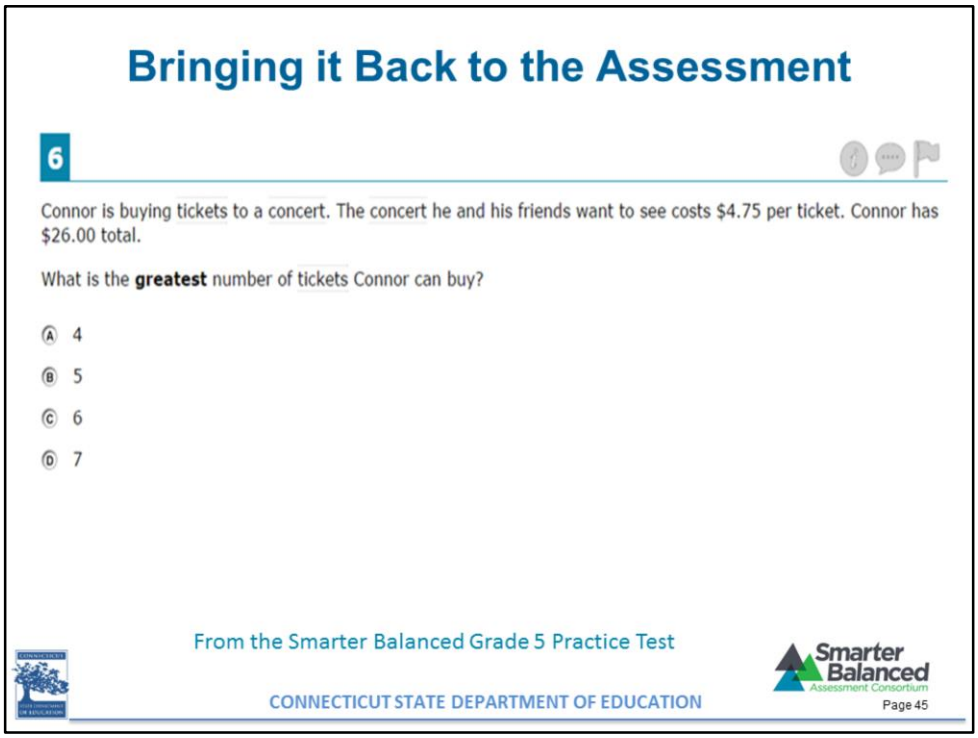
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking

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.



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

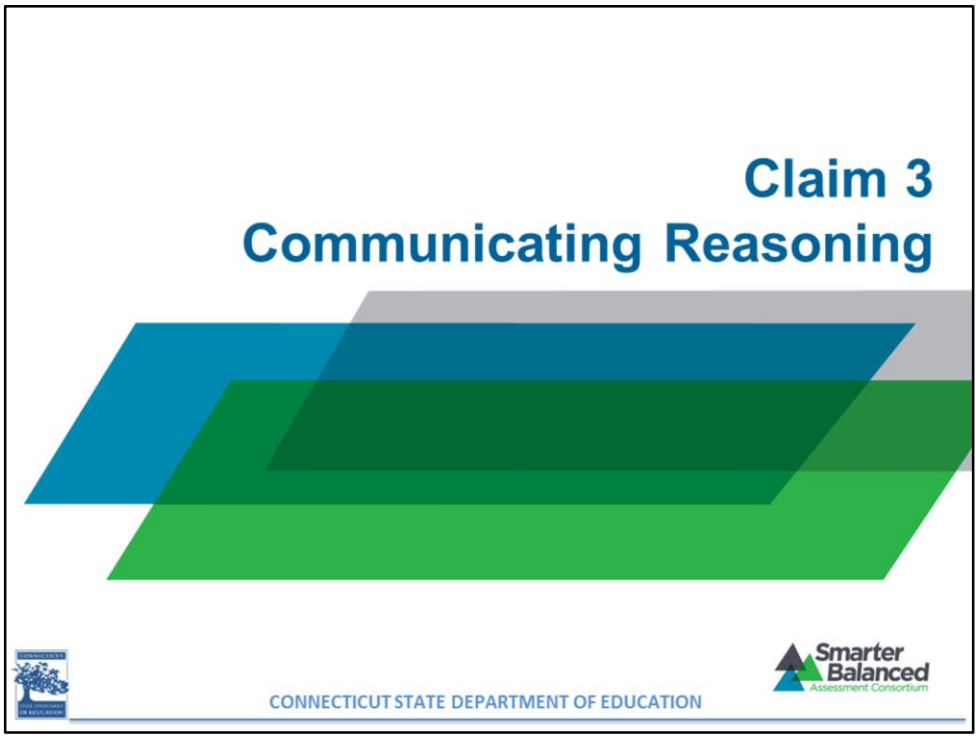
SMP: 2

DOK: 2

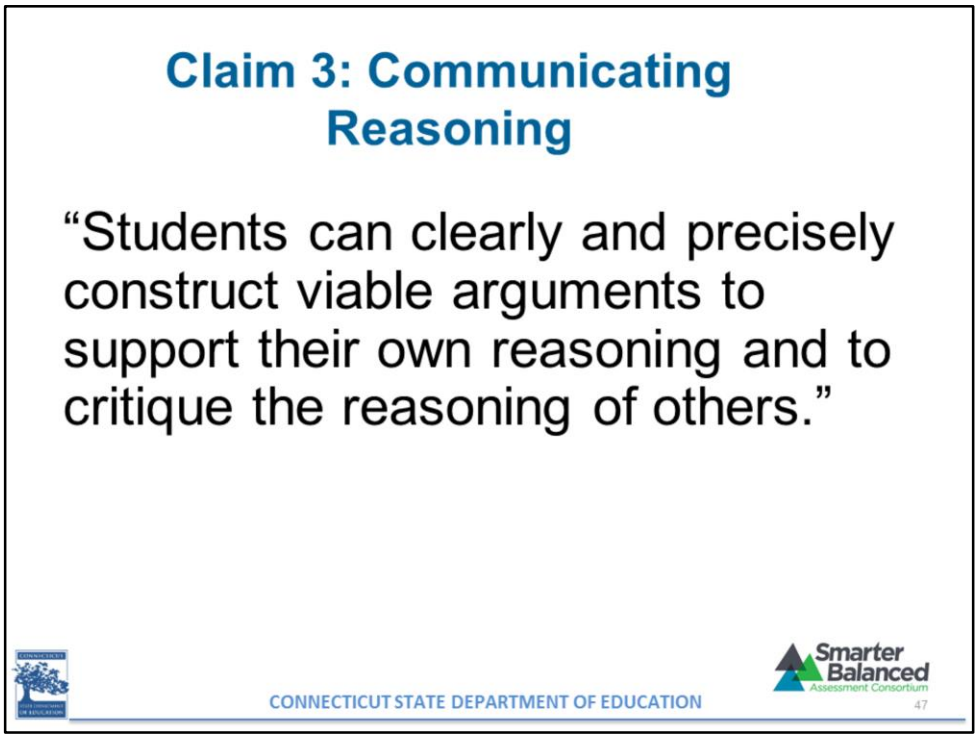
What might a student do to find the correct response?

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.

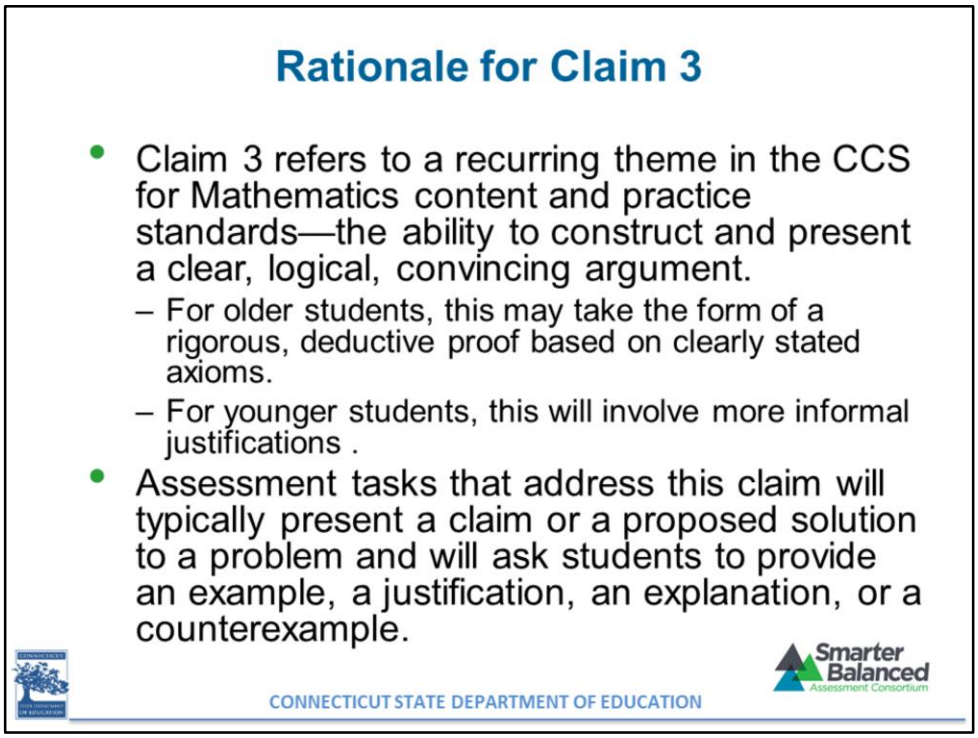
Note: Calculator is not available at grades 3, 4 and 5.



Now we will look at Claim 3, Communicating Reasoning.



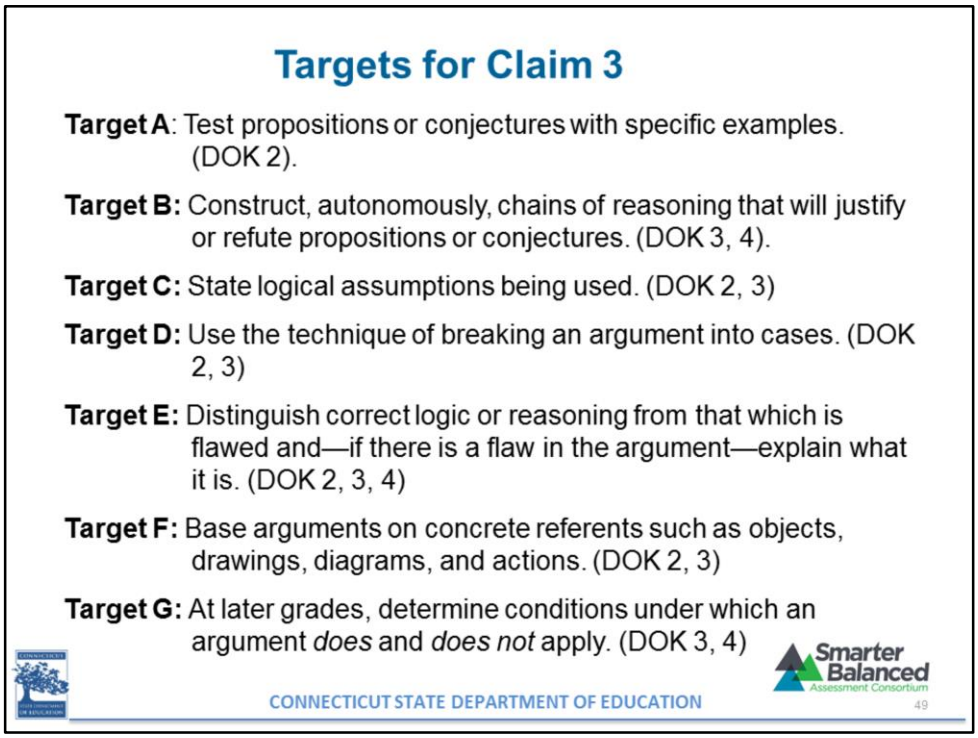
Claim 3 items and tasks measure the extent to which students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.
Though not exclusive, MP3 and MP6 are particularly relevant for Claim 3 items.



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.

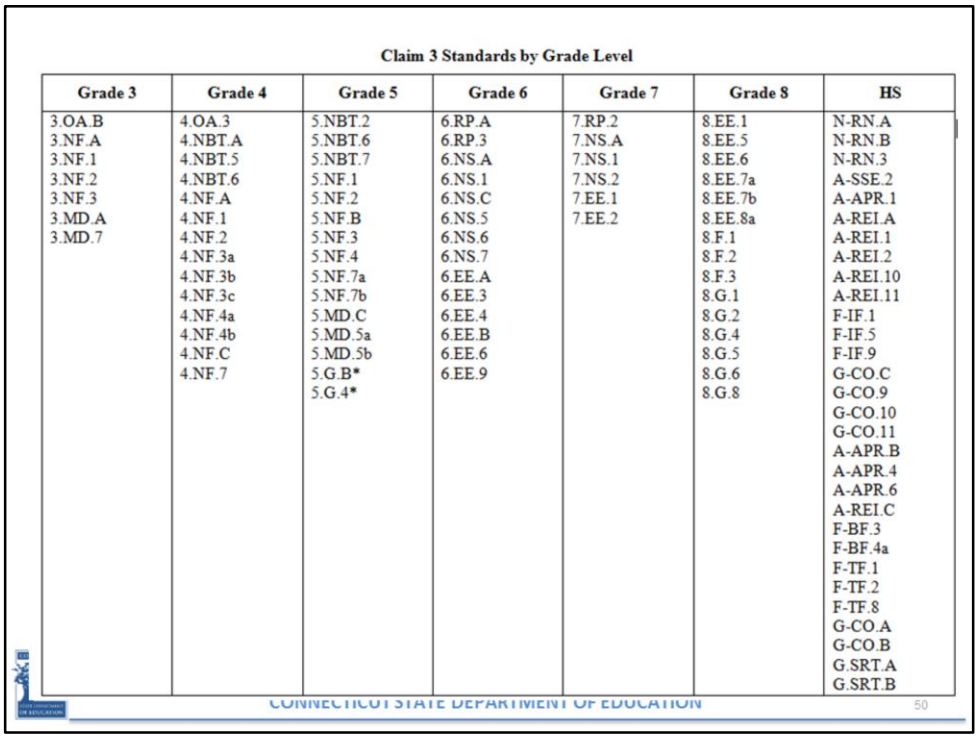
This may look differently across grade levels, for example, in high school students may need to construct a deductive proof based on clearly stated axioms, where younger students will need to provide more informal justifications.

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.



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.

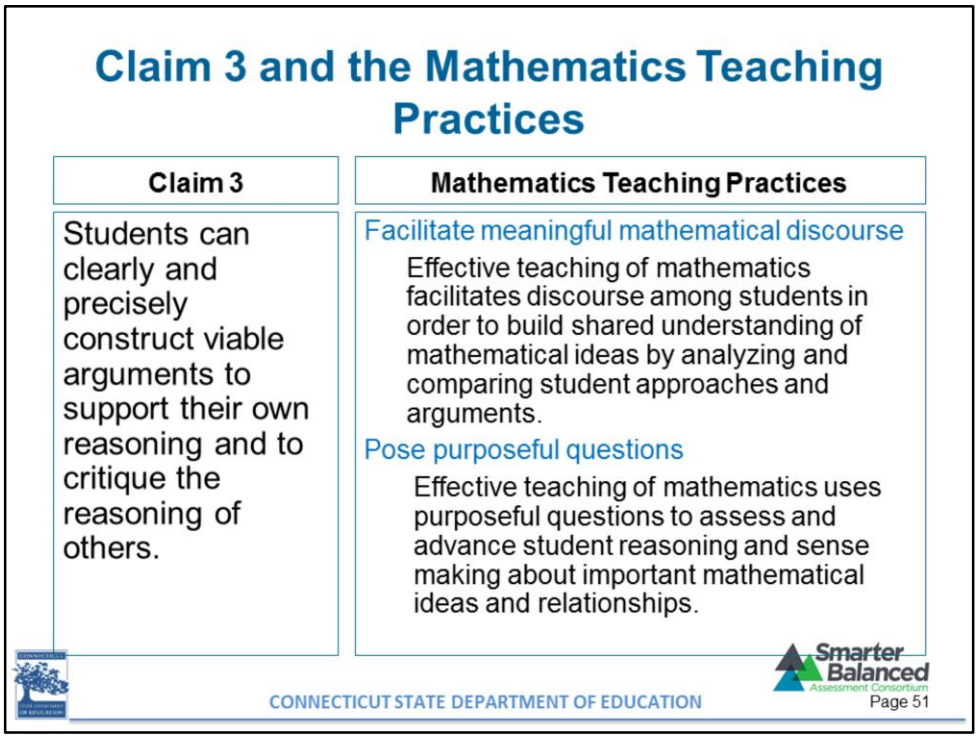


Claim 3 Standards by Grade Level

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.

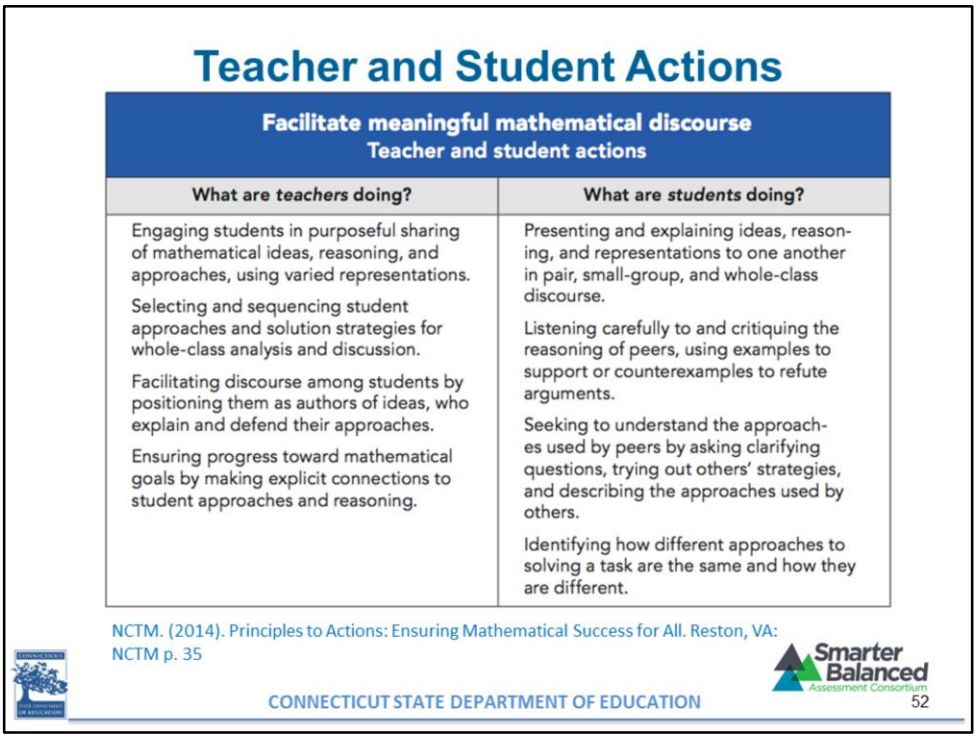
This information is provided in the Smarter Balanced Mathematics Content Specifications.



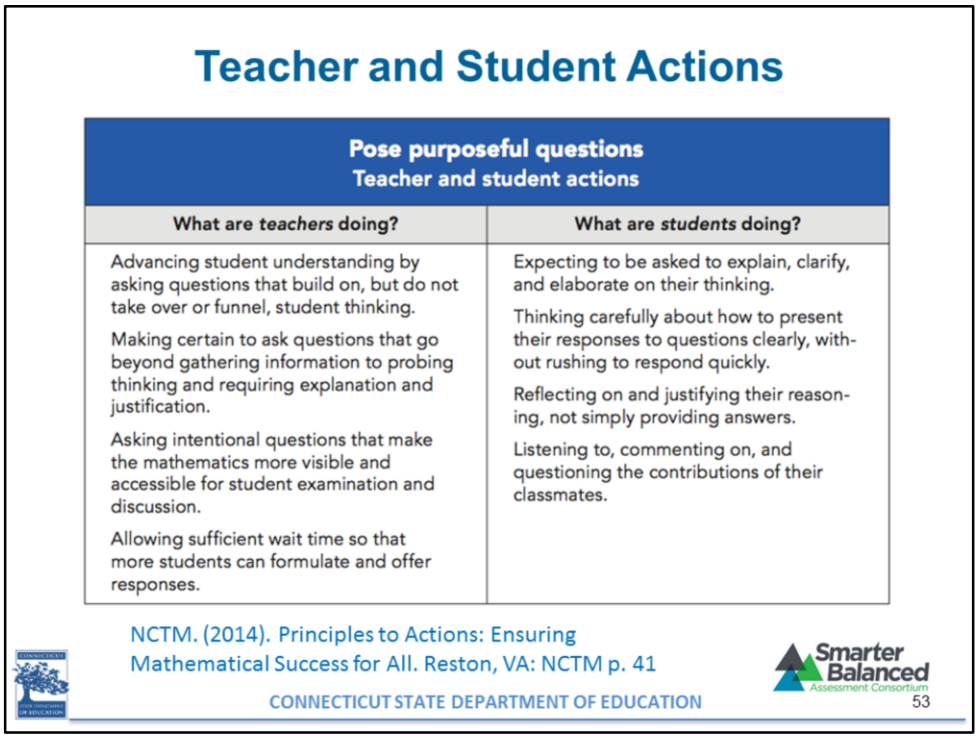
Classroom instruction that incorporates the mathematics teaching practices, "Facilitate meaningful mathematical discourse" and "Pose purposeful questions" will provide opportunities for students to build shared understanding of mathematical ideas by analyzing and comparing various approaches and arguments 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):

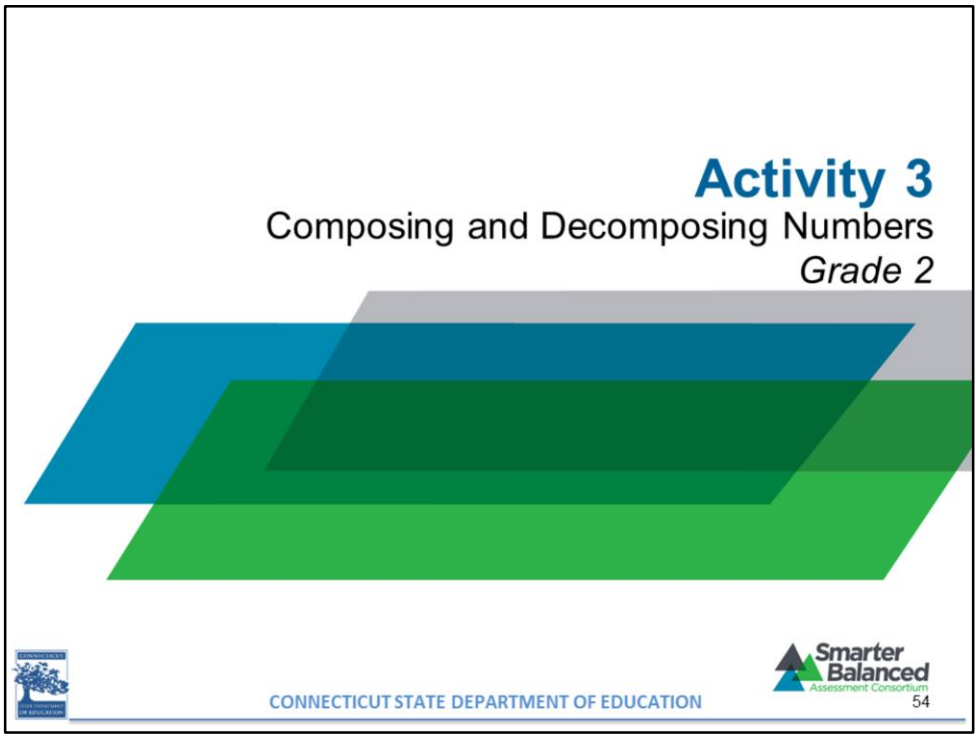
"Mathematical discourse includes the purposeful exchange of ideas through classroom discussion, as well as through other forms of verbal, visual, and written communication."
"Purposeful questions allow teachers to discern what students know and adapt lessons to meet varied levels of understanding, help students make important mathematical connections, and support students in posing their own questions."



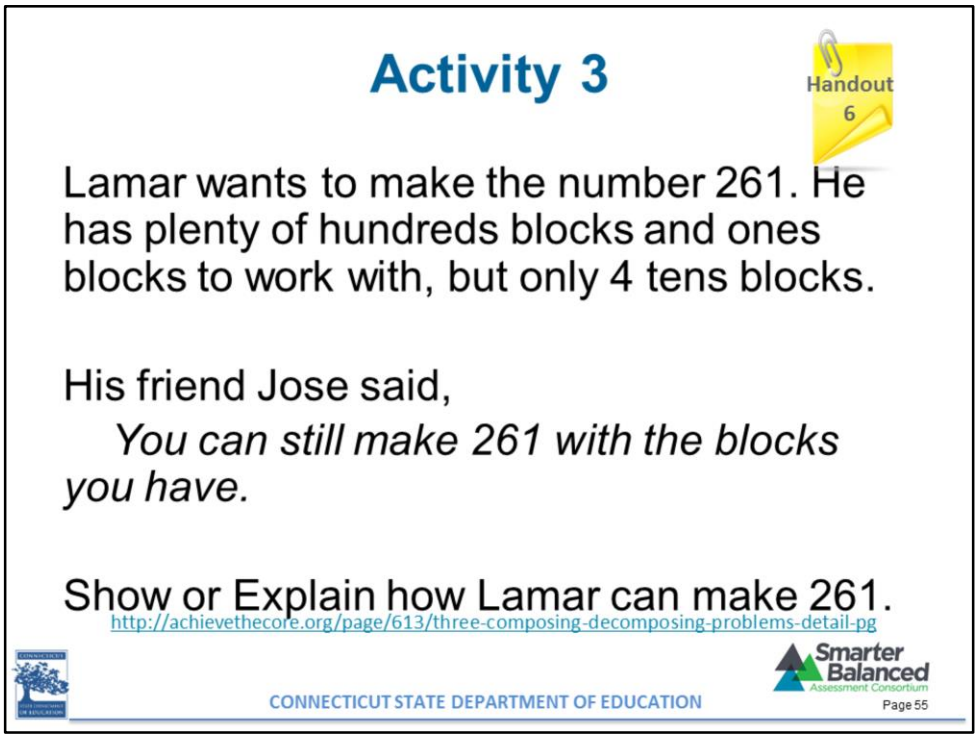
The actions listed in this table provide guidance on what teachers and students do as they engage in meaningful mathematical discourse in the mathematics classroom.



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

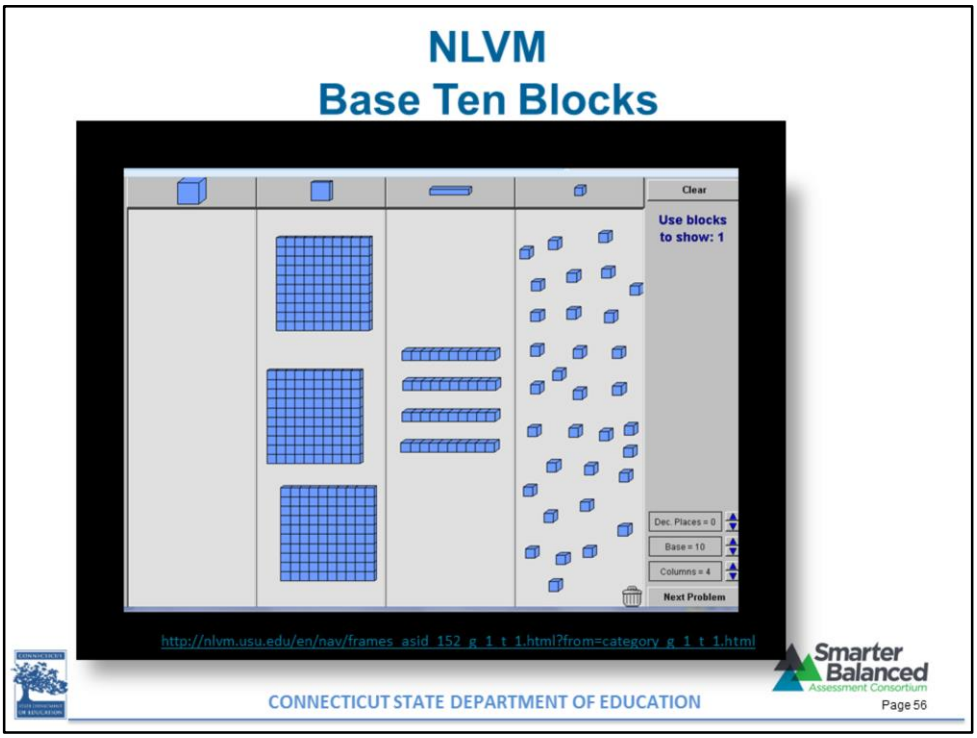


The next activity is a grade 2 activity from Illustrative Mathematics and annotated by Achieve the Core.



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.



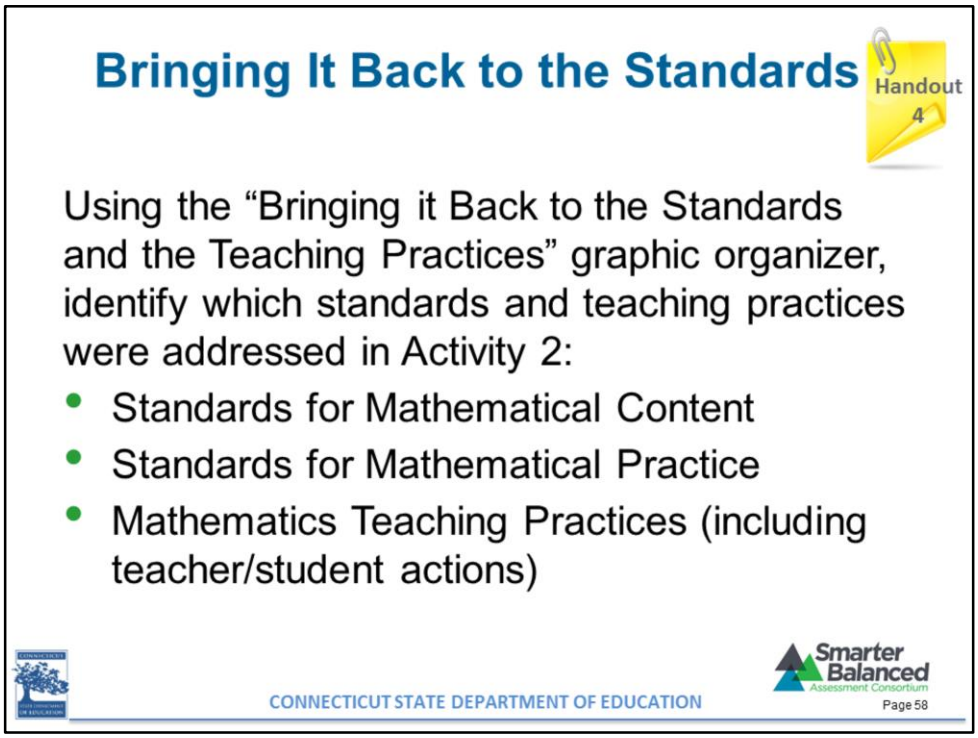
This slide demonstrates the use of base ten blocks from the National Library of Virtual Manipulatives. Use Google Chrome instead of IE if you plan to access this.
Connection to ELA/Literacy Standards… The importance of close reading of this problem (Lamar has only 4 tens blocks).
Click on the block and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

A Passion for Fractions 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



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

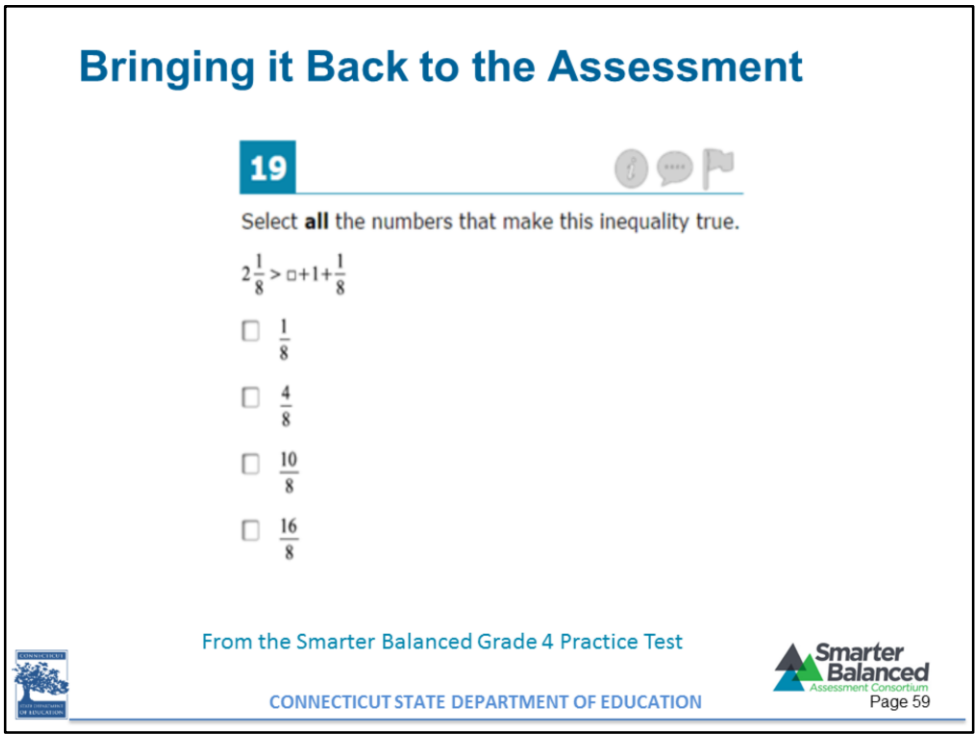
This activity should be part of a larger unit of study aligned to the domain Number and Operations in Base Ten.
This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.

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

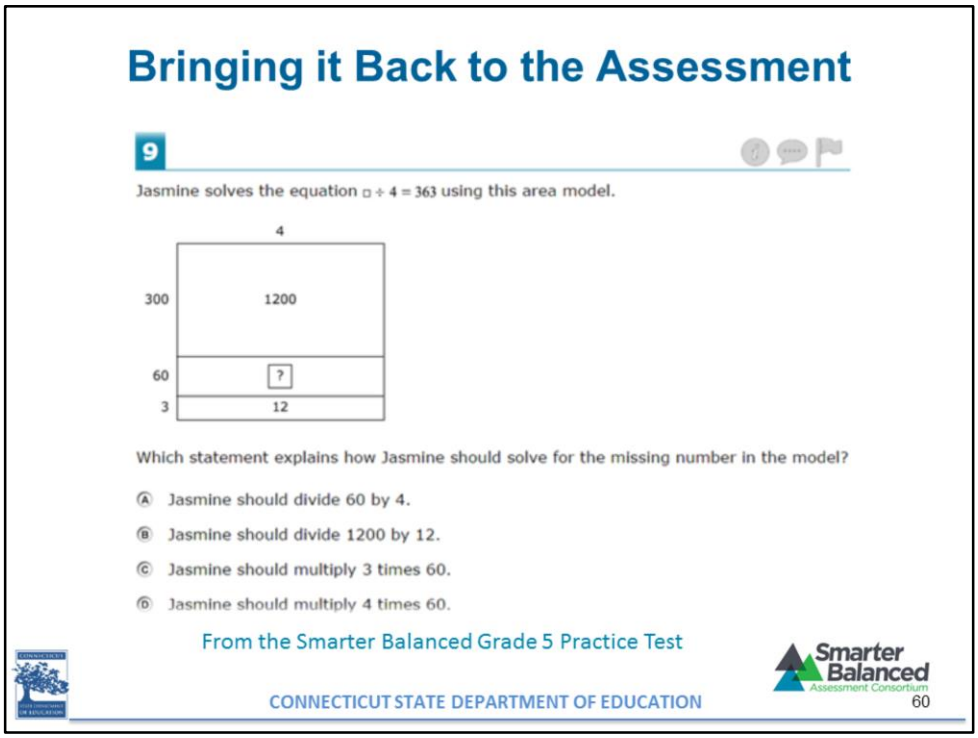
This will help us to confirm the alignment of the activity and eventually the overall unit with the CCS.



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 1/8 and 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?"

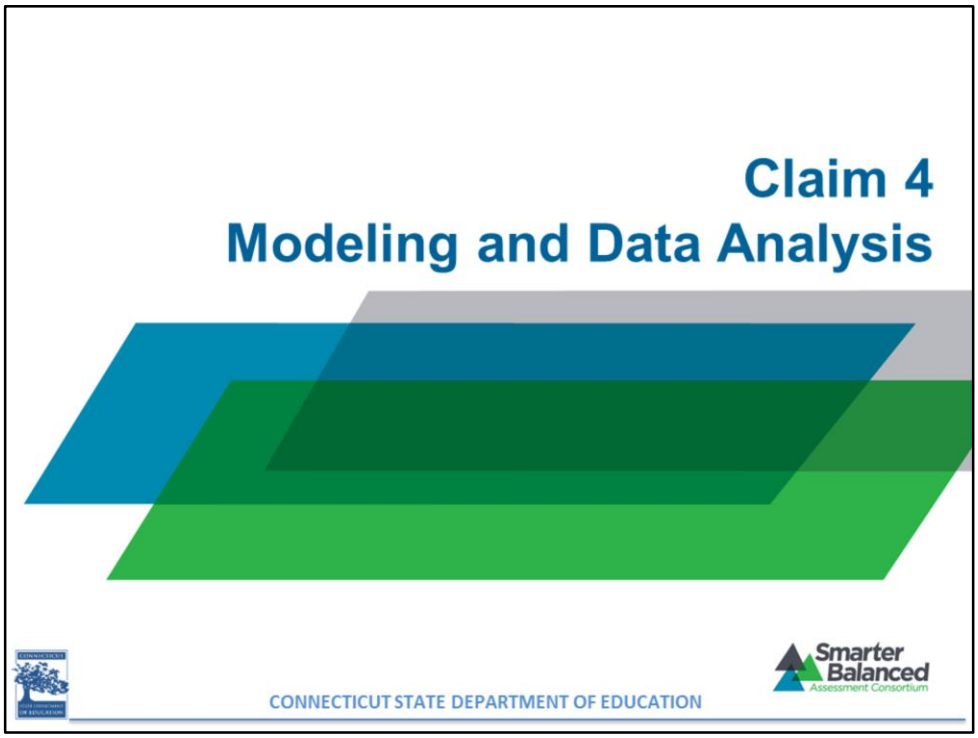
During instruction students should be asked to justify their selections using models such as number lines, and fraction strips or bars.



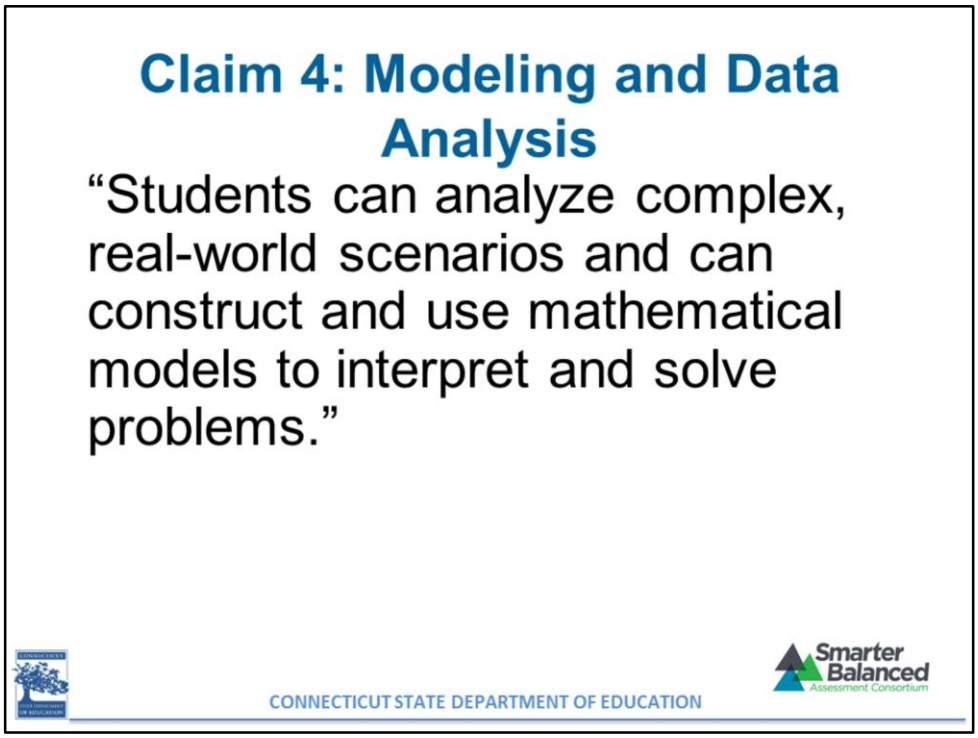
This item is from the Smarter Balanced grade 5 practice test. It is a claim 3 item aligned to target A, test propositions or conjectures with specific examples.
Domain: NBT
Content: 5.NBT.B.6
SMP: 1,3
DOK: 3

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?"



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



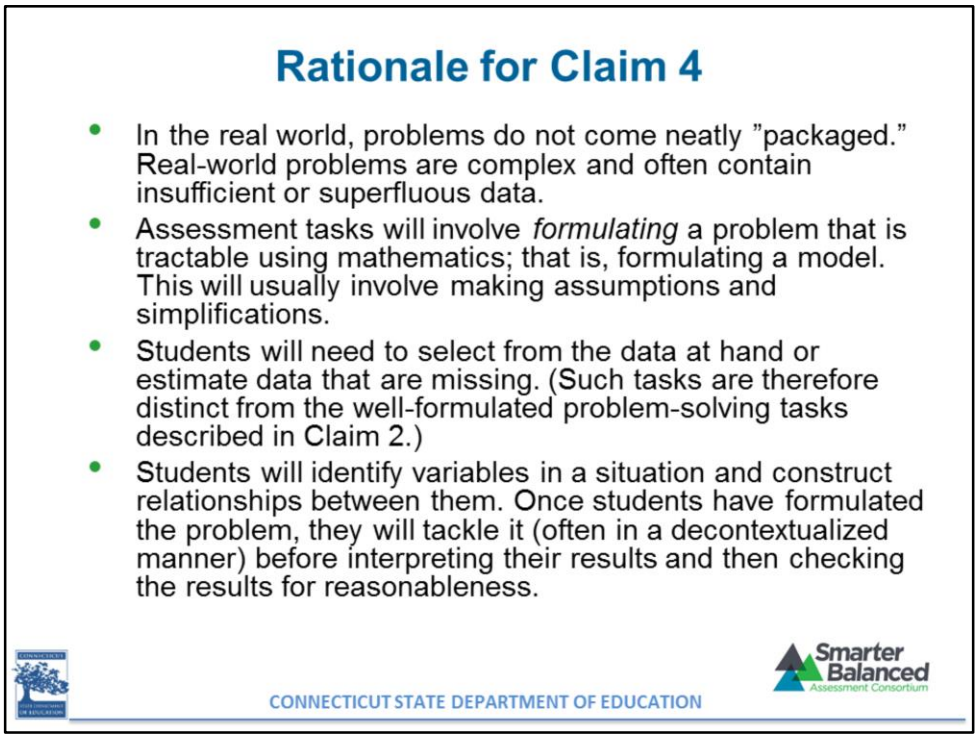
Claim 4 items and tasks measure the extent to which students can analyze complex, real-world scenarios and construct and use mathematical models to interpret and solve problems.

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.



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.

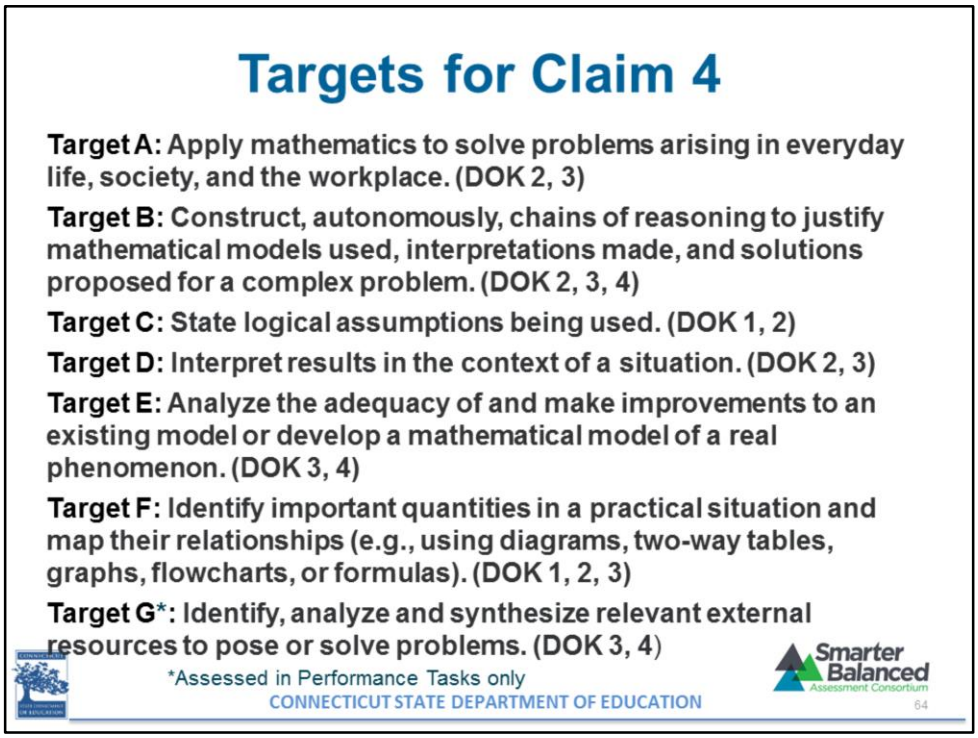
In this way, items and tasks in Claim 4 differ from those in Claim 2, because while the goal is clear, the Claim 4 problems themselves are not yet fully formulated (well-posed) in mathematical terms.

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.

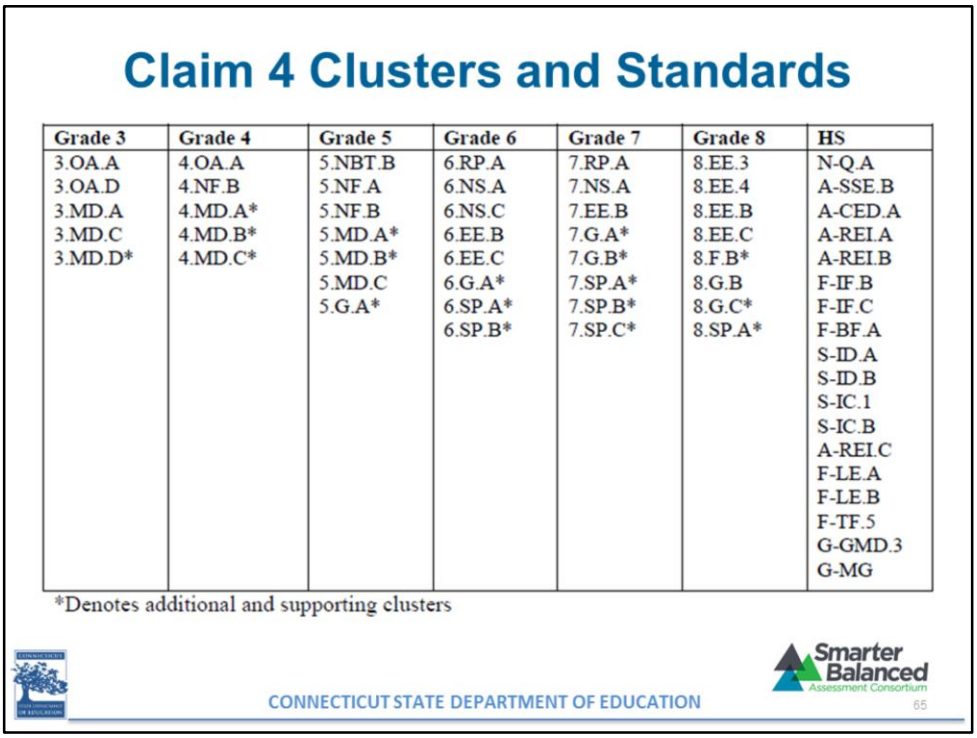
Items and tasks of this sort require students to apply mathematical concepts at a

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



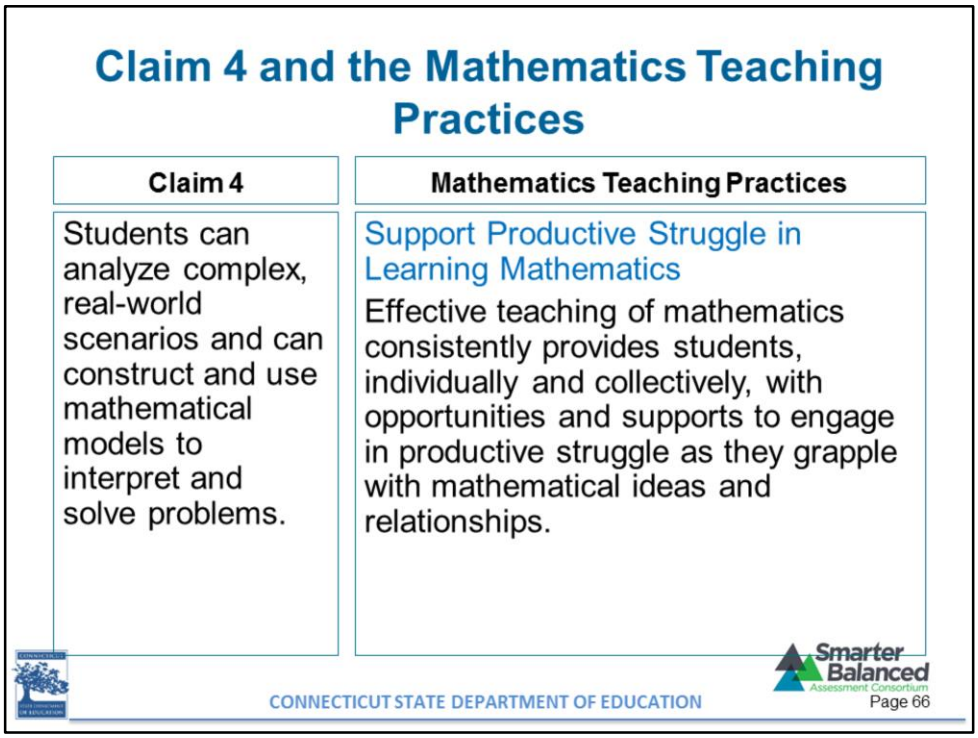
Like Claims 2 and 3, the assessment targets for Claim 4 are common across all grades.

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



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.

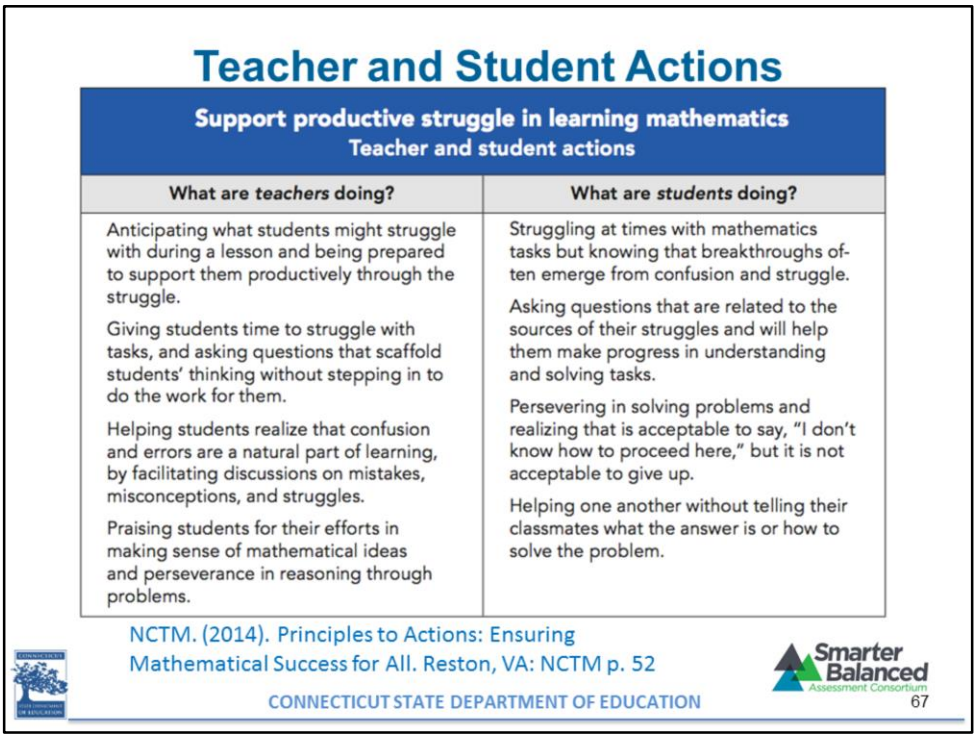


Classroom instruction that incorporates the mathematics teaching practice, "Support Productive Struggle in Learning Mathematics" will provide opportunities for students to engage in productive struggles as they grapple with mathematical ideas and relationships that is needed to formulate the problems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

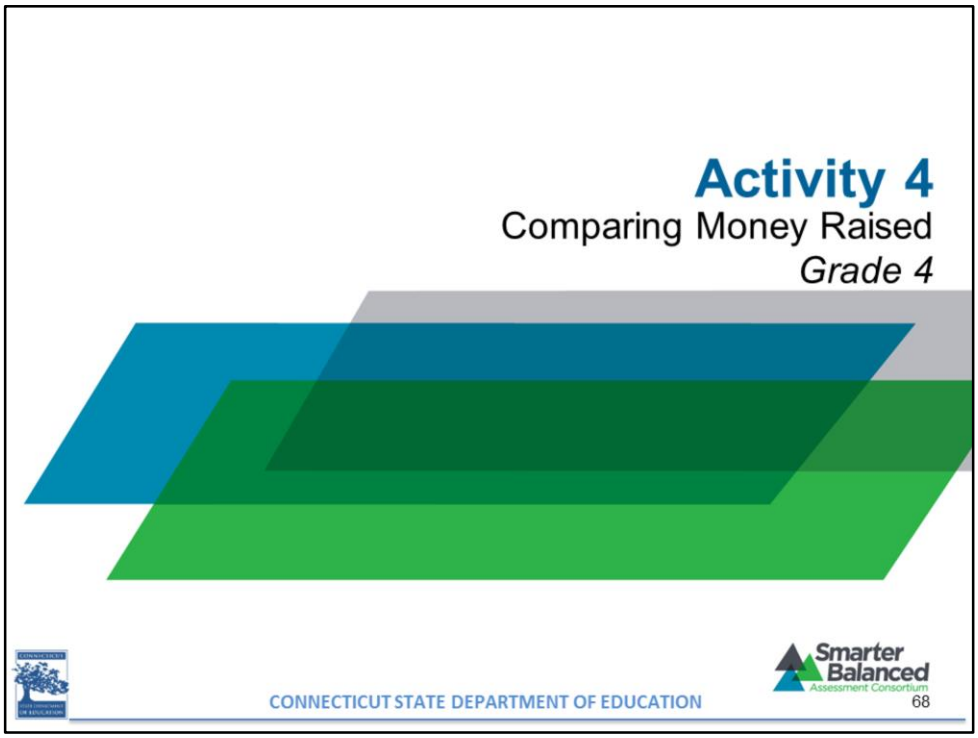
From Principles to Action (page 48):

"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 contract 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)."

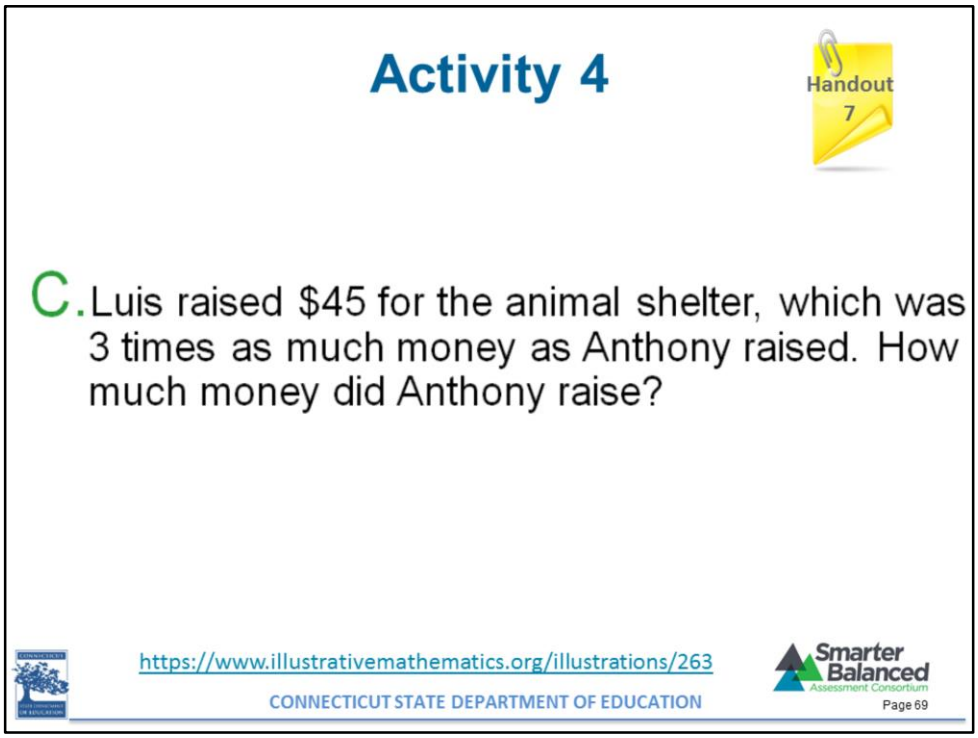
"Teaching that embraced and uses productive struggle leads to long-term benefits, with students more able to apply their learning to new problem situations (Kapur 2010)."



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



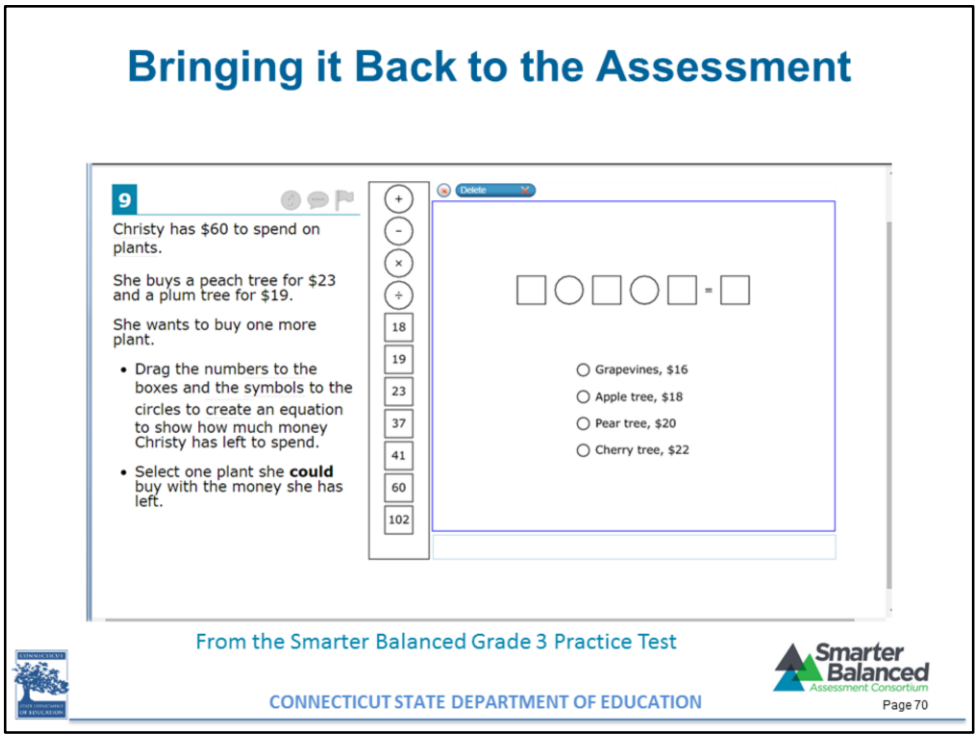
Now we will look at a grade 4 activity from Illustrative Mathematics and annotated by Achieve the Core. It focuses on students ability to model a mathematical scenario by using drawings and equations.



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.

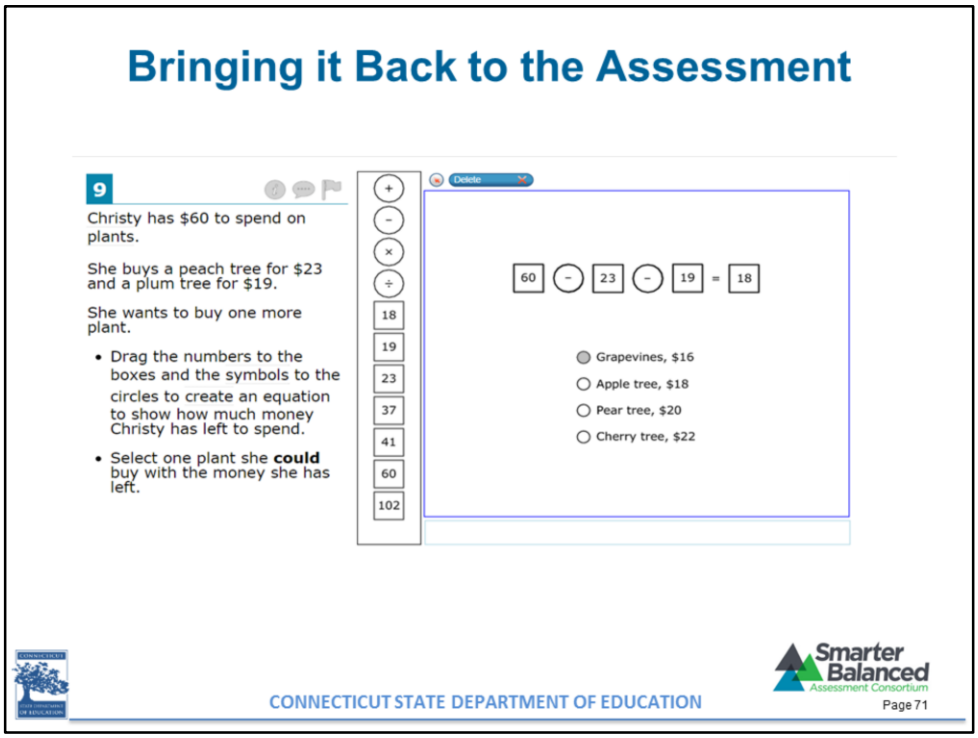
Give groups 3-5 minutes to take a look at tasks A and B to determine which claims these tasks are aligned to. Task A is aligned to Claim 1 because it is procedural and Task B is aligned to Claim 2 because there are multiple approaches. A student could determine the answer using multiplication or division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



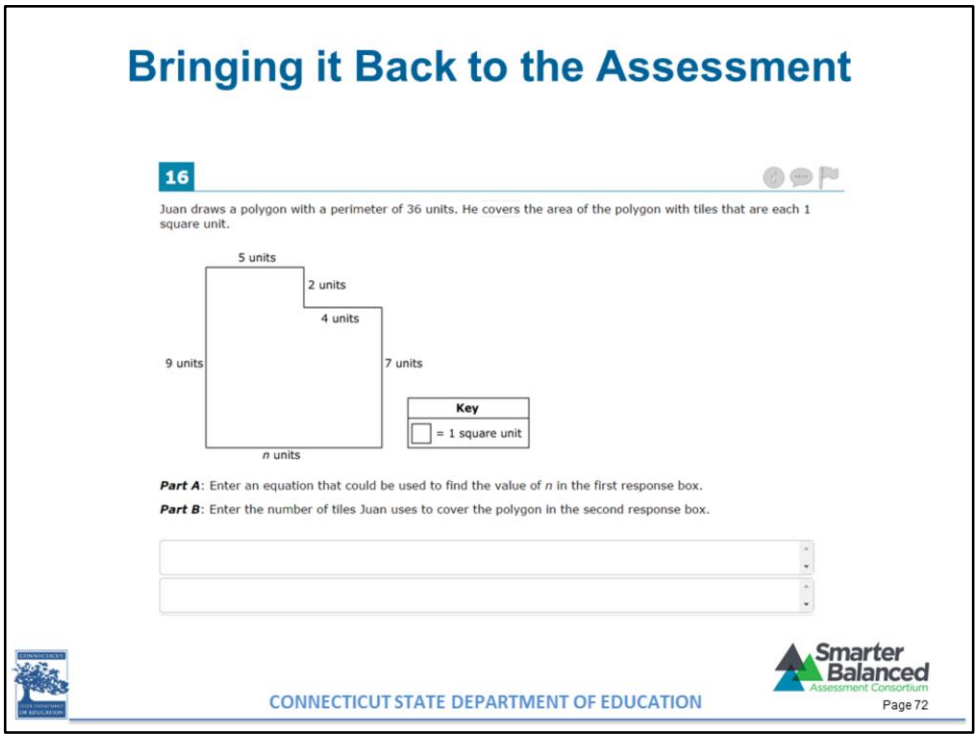
Facilitator Notes: Give participants 2 minutes to read and independently solve this problem using a hard copy of the slide. Direct their attention away from the copy of the power point for this activity.
This item is from the Smarter Balanced Grade 3 Practice Test. It is a Claim 4 item aligned to target D, Interpret results in the context of a situation.

Content: 3.OA.D.8
SMP: 4, 6
DOK: 3



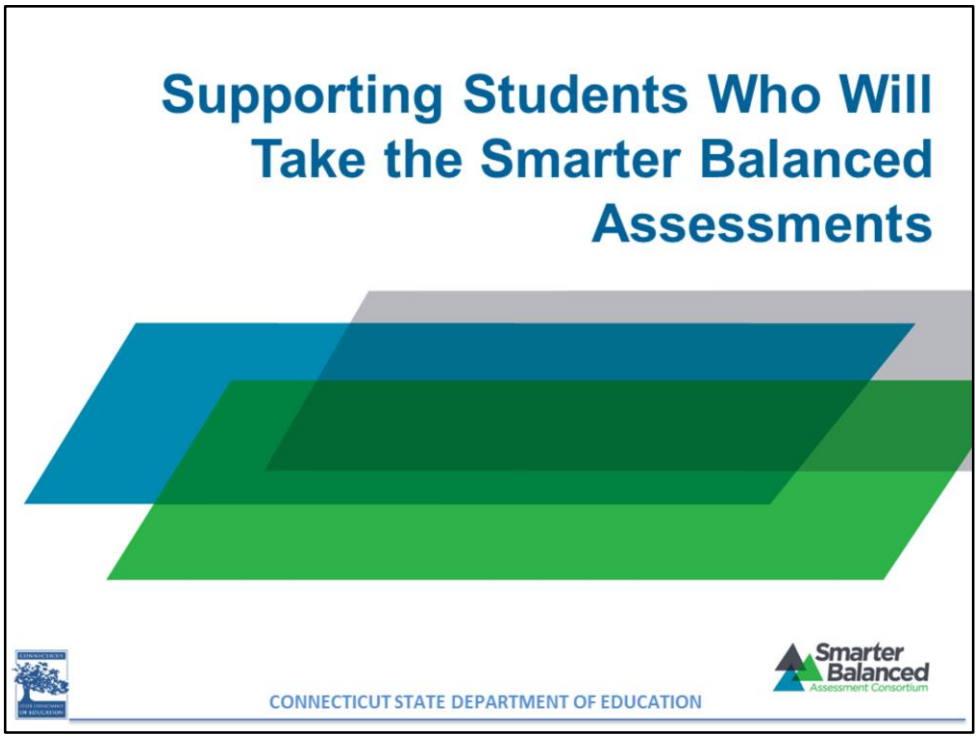
Show this slide and inform them this is one possible correct answer. This problem has other correct responses. Have the participants discuss at their tables the other correct responses, and reflect on what is happening in their classrooms to support students' ability to respond to this type of question.

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.

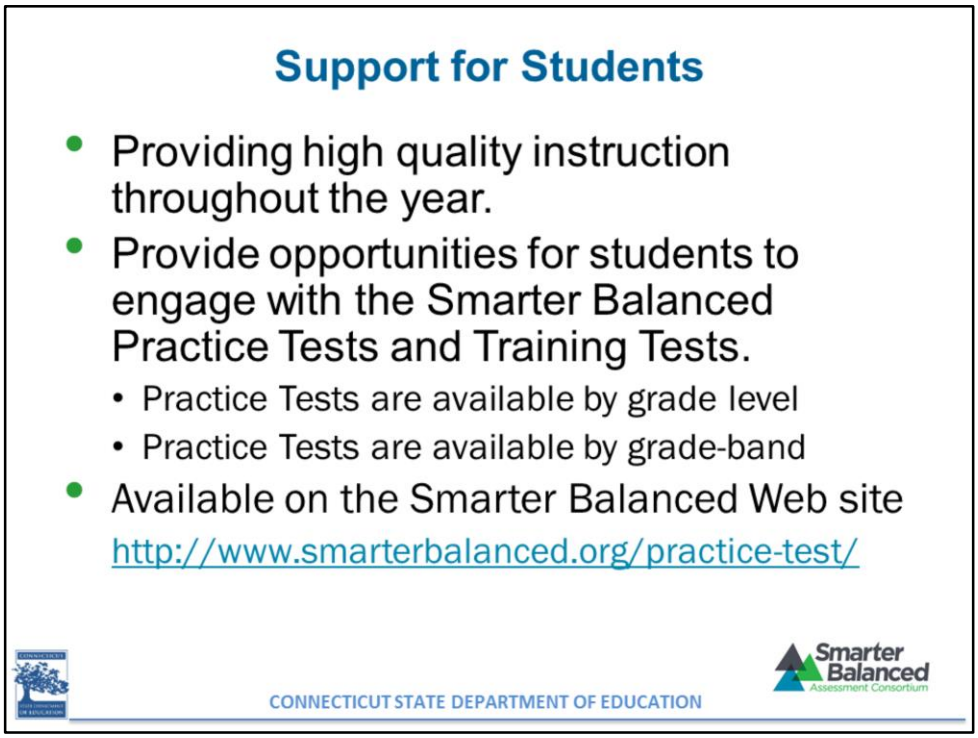


Facilitator Note: This should take 5 minutes to complete and 5 minutes to discuss. Use, only if time allows, to demonstrate a domain that has not yet been addressed.
What do third graders need to know and be able to do in order to provide accurate answers?
This is from the Grade 3 Smarter Balanced Practice 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



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



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

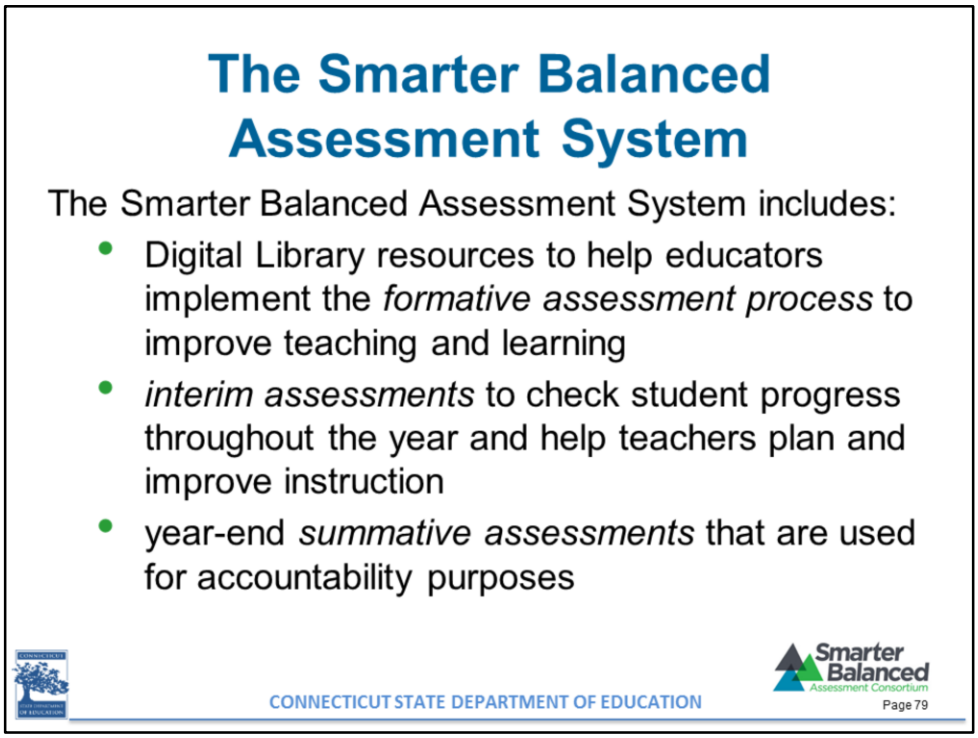
Practice Tests

- 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.

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.

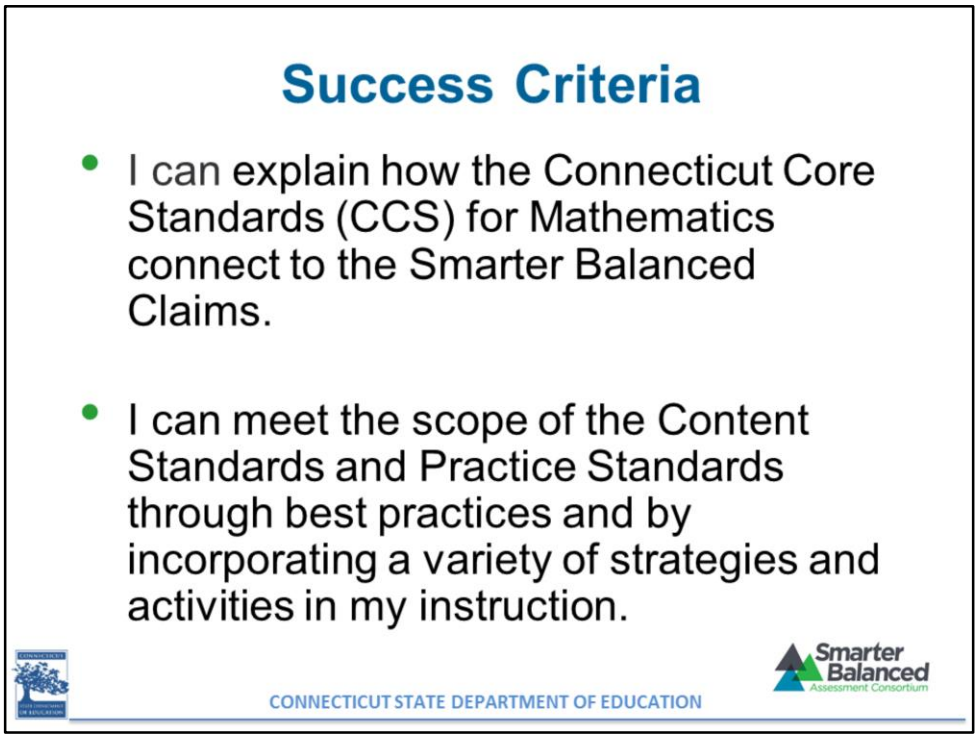
How Does the Smarter Balanced Assessment System Support Instruction?



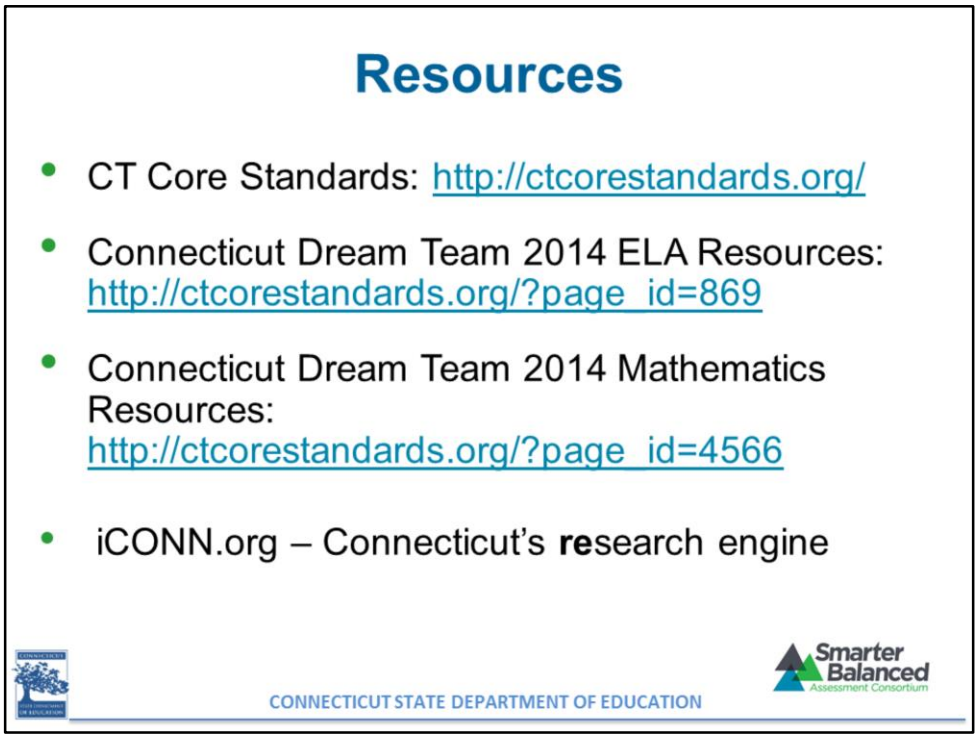
Along with the summative assessment that is used for accountability, the Smarter Balanced Assessment System also includes a Digital Library which contains tools and resources to support the formative assessment process.

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.

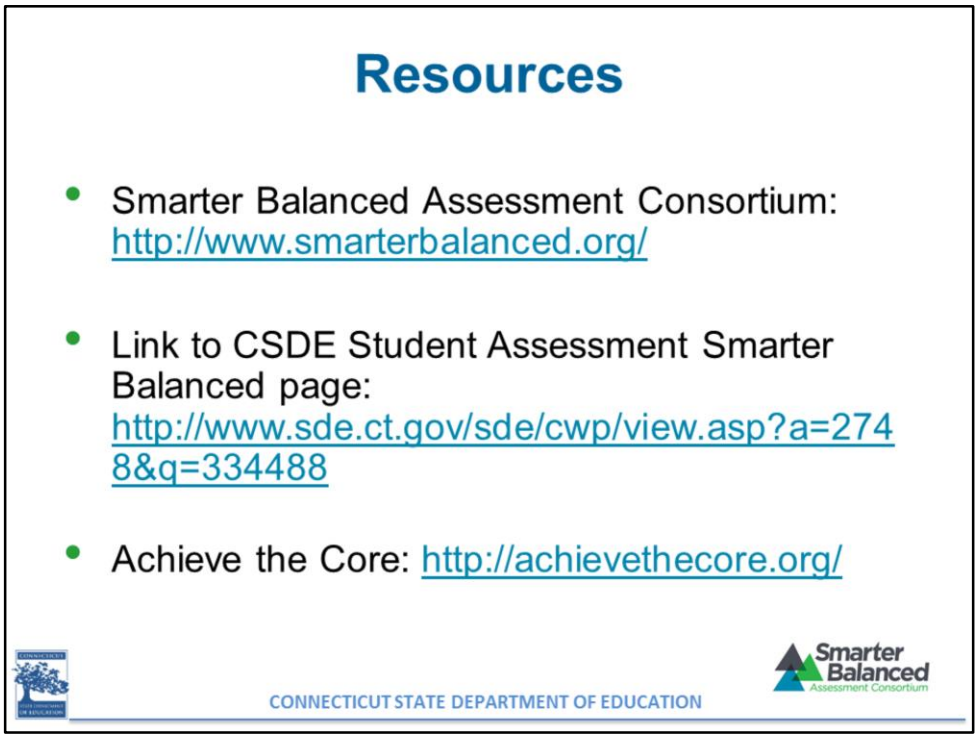
Questions



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!



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



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