Board of Education Regular Meeting
Thursday, April 24, 2014 7:00 PM Eastern

New Fairfield High School Media Center
3 Brush Hill Road
New Fairfield, CT 06812

I.   Call to Order
II.   Pledge of Allegiance
III.   Approval of the Minutes
       III.A.   April 3, 2014 - Regular
IV.   Approval of the Agenda
V.   Chairman's Report
VI.   Superintendent's Report
VII.   Student Representatives' Report
VIII. Committees
       VIII.A. Finance
       VIII.B. Curriculum
       VIII.C. Personnel
       VIII.D. Policy
       VIII.E. Operations
       VIII.F. Field Fees
       VIII.G. Liaison
             VIII.G.1.   Board of Finance
             VIII.G.2.   Magnet School
             VIII.G.3.   Parks and Recreation Committee
             VIII.G.4.   Permanent Building Committee
             VIII.G.5.   Technology
             VIII.G.6.   Safety
             VIII.G.7.   Education Connection
IX.   Information Items
       IX.A.   CCSS (CCSS)
       IX.B.   New Fairfield Public Schools Calendar - 2015-2016
       IX.C.   Capital Improvement Plan 2014 - 2029
X.   Public Participation - The Board welcomes public participation. Pursuant to our
       Board Policy, public participation is limited to no more than three (3) minutes per
       speaker and a total of no more than fifteen (15) minutes. People who wish to
       speak longer are encouraged to attend . . .
XI.   Action Items
       XI.A.   Personnel Report
       XI.B.   Ratification of the School Bus Contract
       XI.C.   Approval of Grant Applications
             XI.C.1.   SDE IDEA 611 and 619 Grant (Meeting Learners' Needs)
             XI.C.2.   CAS-CIAC Endowment and Flanagan Grant (Meeting Learners'
                        Needs)
       XI.D.   Non-tuition Student Requests
       XI.E.   Reduction in Force (This item will be voted on after Executive Session.)
XII.   Other

XIII. EXECUTIVE SESSION FOR THE PURPOSE OF DISCUSSING A PERSONNEL ISSUE

XIV. Adjournment

Claim 2: Problem Solving

Gail Pagano
Connecticut State Department of Education

CSDE Assessment Literacy Workshops
November 13, 14, 18, 19, 2013

Adapted by Barbara Mechler, April 2014

Smarter Balanced
Assessment Consortium

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."

Smarter Balanced
Assessment Consortium

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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.

Smarter Balanced
Assessment Consortium

Targets for Claim 2

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

Target B: Select and use appropriate tools strategically.

Target C: Interpret results in the context of a situation.

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

Essential Properties of Claim 2 Items/Tasks

- For the computer-adaptive (CAT) portion of the summative assessment, Claim 2 will be assessed using a combination of :
  - multiple choice, single correct response; multiple choice, multiple correct response; matching tables; equation/numeric; graphing; and fill-in table items/tasks that focus on making sense of problems and using perseverance in solving them.

- To preserve the focus and coherence of the standards as a whole, Claim 2 items/tasks must draw clearly on knowledge and skills articulated in the progression of standards up to and including that grade.

Mathematical Practices

- The evidence required of students to satisfy Claim 2 centers around specific statements of the *mathematical practices* (MP) contained in the CCSSM. Though not exclusive, MP1, MP5, MP7, and MP8 are particularly relevant for Claim 2 items.

Math Practice Standards
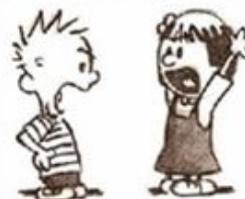## Mathematically Proficient Students Will...

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.
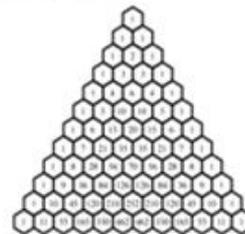
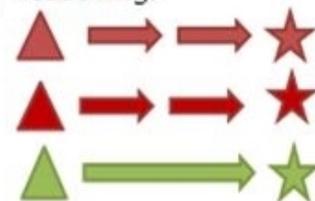**4** Model with mathematics.

5 Use appropriate tools strategically.

6 Attend to precision.
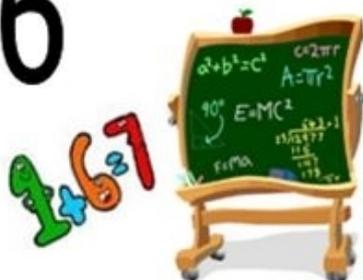
7 Look for and make use of structure.

8 Look for and express regularity in repeated reasoning.

Standard for Mathematical Practice	Student Friendly Language
1. Make sense of problems and persevere in solving them.	• I can try many times to understand and solve a math problem.
5. Use appropriate tools strategically.	• I can use math tools, pictures, drawings, and objects to solve the problem.
6. Look for and make use of structure	• I can use what I already know about math to solve the problem.
7. Look for and express regularity in repeated reasoning.	• I can use a strategy that I used to solve another math problem.

Task Model 1: Target A

Apply mathematics to solve well-posed problems in pure mathematics and arising in everyday life, society, and the workplace.

Under claim 2, the problems should be completely formulated, and students should be asked to find a solution path from among their readily available tools.

- Mathematical information is presented in a table or graph or extracted from a context.

Make sense of problems and persevere in solving them.

When presented with a problem, I can make a plan, carry out my plan, and check its success.

BEFORE...

EXPLAIN the problem to myself.

MAKE A PLAN to solve the problem

- *What is the question?*
- *What do I know?*
- *What do I need to find out?*
- *What tools/strategies will I use?*

DURING...

PERSEVERE (Stick to it!)

MONITOR my work

ASK myself, "Does this make sense?"

CHANGE my plan if it isn't working out

AFTER...

CHECK

- *Is my answer correct?*
- *How do my representations connect to my solution?*

EVALUATE

- *What worked/didn't work?*
- *How was my solution similar or different from my classmates'?*

Grade 4 Example of Task Model 1/Target A

Tina and Marco play a number game. Tina gives Marco a number and he does three computations.

- He multiplies the number by 2.
- He adds 7 to the answer.
- Then, he subtracts 2 from that answer.

What number should Tina give Marco so that the final answer is 37?

Exemplar: 16

Rubric: (1 point) The student enters the correct number.

•

Two sides of a right triangle have lengths $\sqrt{10}$ units and $\sqrt{6}$ units. There are two possible lengths for the third side.

Enter the longest possible side length, in units, for the third side of this triangle.

Exemplar: 4

(1 point) The student correctly enters the longest side of the triangle.

Response Type: Equation/numeric

Example High School Item for Task Model 1/Target A

Hannah makes 6 cups of cake batter. She pours and levels all the batter into a rectangular cake pan with a length of 11 inches, a width of 7 inches, and a depth of 2 inches.
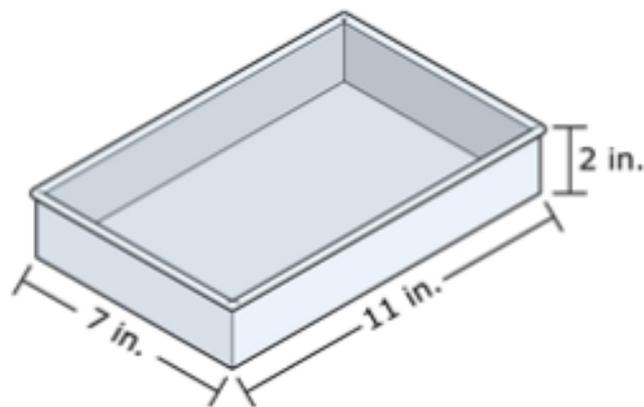
One cubic inch is approximately equal to 0.069 cup.

What is the **depth** of the batter in the pan when it is completely poured into the pan? Round your answer to the nearest $\frac{1}{8}$ inch.

Exemplar: $1\frac{1}{8}$

Rubric: (1 point) Student correctly determines the depth.

Task Model 2: Target B

Select and use appropriate tools strategically

Tasks used to assess this target should allow students to find and choose tools; for example using a protractor in physical space.

- Mathematical information is presented in a table or graph or extracted from a context.
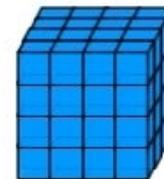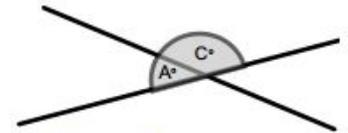- The student is asked to solve a problem that requires strategic use of tools or formulas.

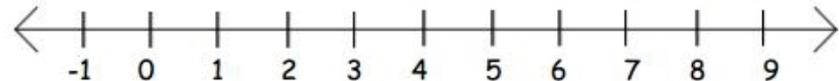# Use appropriate tools strategically.

Mathematical Practice 5

I can use certain tools to help me explore and deepen my math understanding.

- I know **HOW** and **WHEN** to use math tools.

- I can reason: *"Did the tool I used give me an answer that makes sense?"*
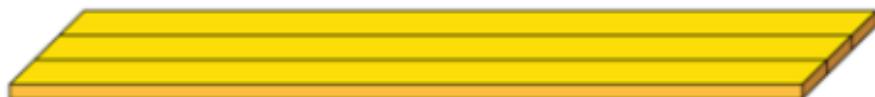
$$a \times b = b \times a$$

Example Grade 5 Item for Task Model 2/Target B

Shelbi builds a platform with wooden boards. Each board is 100 millimeters wide.

Shelbi places the boards side by side to build the platform.

The platform has a total width of 12 meters. Enter the **fewest** number of boards that Shelbi needs to build the platform.
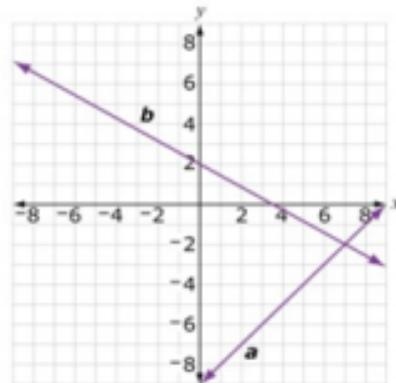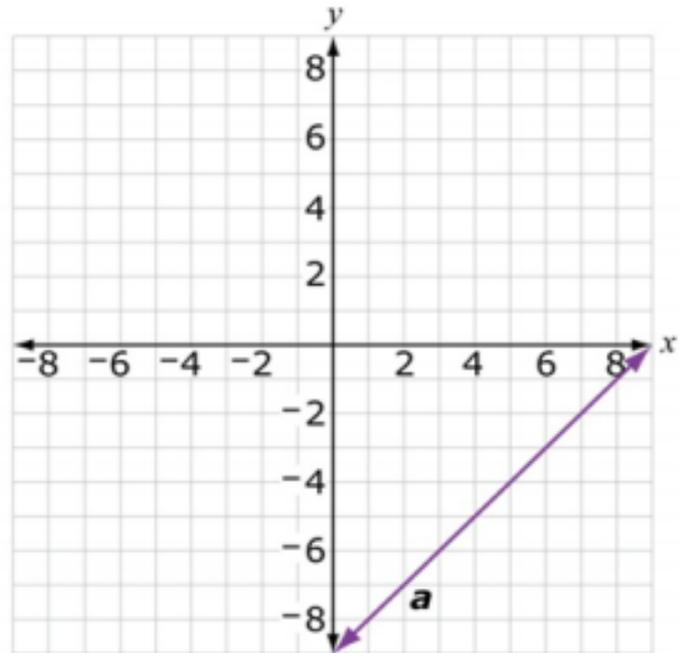
Exemplar: 120

Rubric: (1 point) Student enters the correct number.

Grade 8 Example Item for Task Model 2/Target B

Line *a* is shown on the graph below. Use the Add Arrow tool to construct line *b* on the graph so that:

- Line *a* and line *b* represent a system of linear equations with a solution of (7, -2).
- The slope of line *b* is greater than -1 and less than 0.
- The *y*-intercept of line *b* is positive.

Exemplar:

Rubric: (1 point) The student is able to construct a line that meets the requirements.

Task Model 3: Target C

Interpret results in the context of a situation.

Tasks used to assess this target should ask students to link their answer(s) back to the problem's context. In early grades, this might include a judgment by the student of whether to express an answer to a division problem using a remainder or not based on the problem's context. In later grades, this might include a rationalization for the domain of a function being limited to positive integers based on a problem's context (e.g., understanding that the number of buses required for a given situation cannot be 32½, or that the negative values for the independent variable in a quadratic function modeling a basketball shot have no meaning in this context).

Look for and make use of structure.
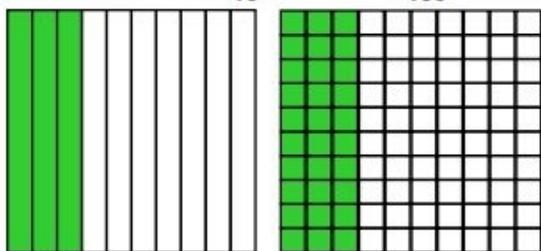
Mathematical Practice 7

I can see and understand how numbers and spaces are organized and put together as parts and wholes.

Numbers

For Example:

I know that $\frac{3}{10}$ is equal to $\frac{30}{100}$.

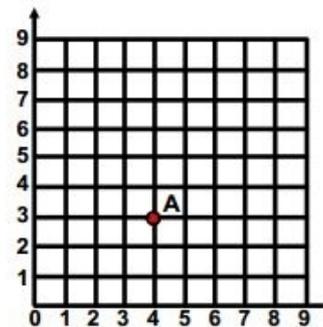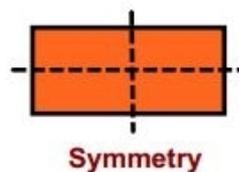So, $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.

Equivalent Fractions

Spaces

For Example:

Lines and Angles

Symmetry

Location

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Jordan School District 2012, Grades 4-5
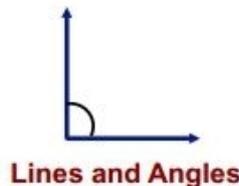
Grade 5 Example of Task Model 3/Target C

Carl feeds his dog $2\frac{1}{2}$ cups of dog food every day. Each bag contains 64 cups of dog food. What is the maximum number of days that Carl can feed his dog exactly $2\frac{1}{2}$ cups of dog food from one full bag?

Exemplar: 25

Rubric: (1 point) The student is able to determine the maximum number of servings from one bag of food and interpret the remainder as not being enough for another serving.

Grade 7 Example Item for Task Model 3/Target C

This table shows the monthly account changes in Sara's account balance. For example, the account change of +$38 means that Sara's balance was $38 more at the end of the last day of January than at the beginning of first day in January.

Month	Account Change
January	+$38
February	−$30
March	−$19
April	+$49

Determine whether each statement about Sara's bank account balance is true based on the table. Select True or False for each statement.

Statement	True	False
Sara has less money in her account at the end of February than at the end of any other month.		
Sara's account balance is the same at the end of April as it is at the end of January.		
Sara has more money in her account at the end of April than she had at the **beginning** of January.		

Key: FTT

Task Model 4: Target D

Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).

For Claim 2 tasks, this may be a separate target of assessment explicitly asking students to use one or more potential mappings to understand the relationship between quantities. In some cases, item stems might suggest ways of mapping relationships to scaffold a problem for Claim 2 evidence.

Look for and express regularity in repeated reasoning. Mathematical Practice 8

I can notice when calculations are repeated. Then, I can find more general methods and short cuts.
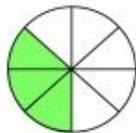
As I work...	There are many ways to decompose $\frac{3}{8}$ because it is composed of repeated $\frac{1}{8}$s.
	I CAN.....
...I think about what I'm trying to figure out while I pay attention to the details	....**draw** a whole and shade in three $\frac{1}{8}$s parts. ....**add** eighths. $\quad \frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ ....**count by** eighths. *(one-eighth, two eighths, three eighths)* $\quad \frac{3}{8} = \frac{1}{8}, \frac{1}{8}, \frac{1}{8}$
...I evaluate if my results are reasonable.	....**jump** three $\frac{1}{8}$ size jumps on a number line. $\frac{0}{8} \quad \frac{1}{8} \quad \frac{2}{8} \quad \frac{3}{8} \quad \frac{4}{8} \quad \frac{5}{8} \quad \frac{6}{8} \quad \frac{7}{8} \quad \frac{8}{8}$ $0 \qquad\qquad\qquad\qquad\qquad\qquad\qquad 1$

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Jordan School District 2012, Grades 4-5
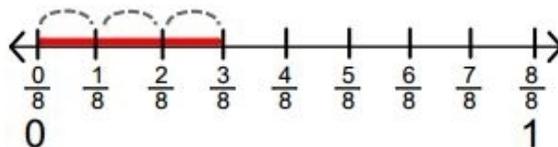
Example Grade 4 Item for Task Model 4/Target D

Tim and Cam made posters for art class. They each used 1 poster board, 3 markers, and 3 feet of ribbon. The table shows the cost of their supplies.

Supplies	Cost
1 Poster board	$5
3 Markers	$2 + $2 + $2
3 feet Ribbon	$1 + $1 + $1

They each figured out how much the supplies cost in a different way.

Tim's Solution
$5 + (3 \times 2) + (3 \times 1) = 14$

Cam's Solution
$5 + 3 \times (2 + 1) = 14$

Which of these explains why they got the same result?

A. $(3 \times 2) + (3 \times 1) = 3 \times (2 + 1)$*

B. $5 + (3 \times 2) = 3 \times (2 + 1)$

C. $(3 \times 2) = 3 \times (2 + 1)$

D. $3 \times (5 + 1 + 1) = 5 + 3 \times (2 + 1)$

Example Grade 7 Item for Task Model 4/Target D

(Source: Adapted from Illustrative Mathematics, Grade 7.EE)

The students in Mr. Sanchez's class are converting distances measured in miles (m) to kilometers (k). Abby and Renato use the following methods to convert miles to kilometers.

- Abby takes the number of miles, doubles it, then subtracts 20% of the result.
- Renato first divides the number of miles by 5, then multiplies the result by 8.

Which equation correctly shows why both their methods produce the same result?

A. $2m - 0.20 = \frac{m}{5} \cdot 8$

B. $2m - 0.20(2m) = \frac{m}{5} \cdot 8$

C. $2m - 2.20m = \frac{m}{5} + 8\left(\frac{m}{5}\right)$

D. $0.20(2m) - 2m = \frac{m}{5} + 8\left(\frac{m}{5}\right)$

High School Item for Task Model 4/Target D

Consider triangle *ABC*, where angle *C* is a right angle.

Drag all measures shown for angle *A* into the correct column.

Angle A	$\cos A < \sin A$	$\cos A = \sin A$	$\cos A > \sin A$
10°			
65°			
45°			
30°			
85°			
70°			

Rubric: (1 point) The student correctly classifies all angles (e.g., see below).

Angle A	$\cos A < \sin A$	$\cos A = \sin A$	$\cos A > \sin A$
10°	65°	45°	30°
65°	85°		10°
45°	70°		
30°			
85°			
70°			

Response Type: Drag and Drop

Reflect on Guiding Questions

- What do educators need to do to support student learning?

- What do educators need to do to ensure that students are prepared for the Smarter Balanced assessments?