Preparing for Common Core State Standards in Math

Nancy O'Rode
CSUN
nancyo@csun.edu

Robert Kaplinsky
Downey USD
rkaplinsky@dusd.net

"What Really Works" in Education Conference

March 22, 2013

Today

1. The Common Core's Three Shifts in Mathematics
2. Differences between the old and new standardized assessments.
3. The Common Core's Standards for Mathematical Practice
4. Resources

The Three Shifts in Mathematics

- Focus
- Coherence
- Rigor
  - Procedural skill and fluency
  - Conceptual understanding
  - Application

California Standards Tests

26 **The sales tax for an item is $0.47. What is the amount of tax rounded to the nearest dime?**

A $0.40

B $0.45

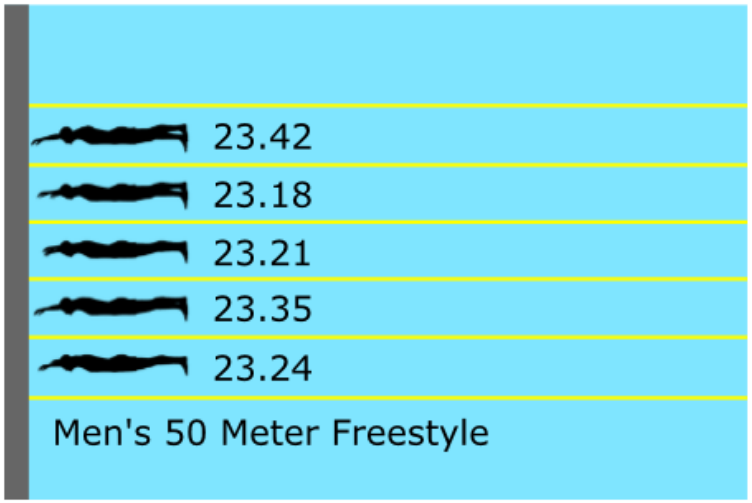
C $0.47

D $0.50

CSM10629

Smarter Balanced Assessment Consortium Test

- Five swimmers compete in the 50-meter race. The finish time for each swimmer is shown in the video.



- Explain how the results of the race would change if the race used a clock that rounded to the nearest tenth.

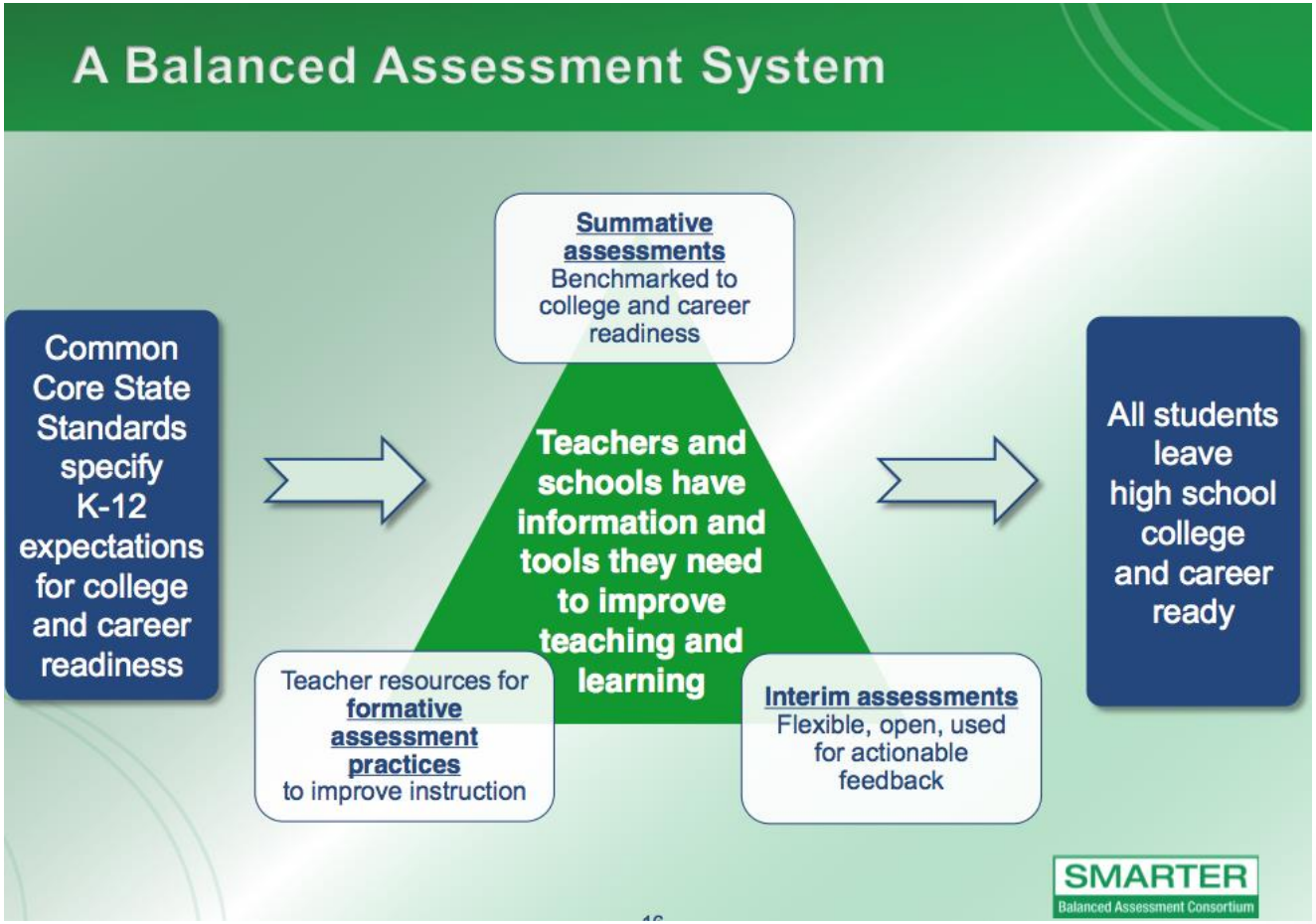
Smarter Balanced Assessment Consortium (SBAC)

A National Consortium of States

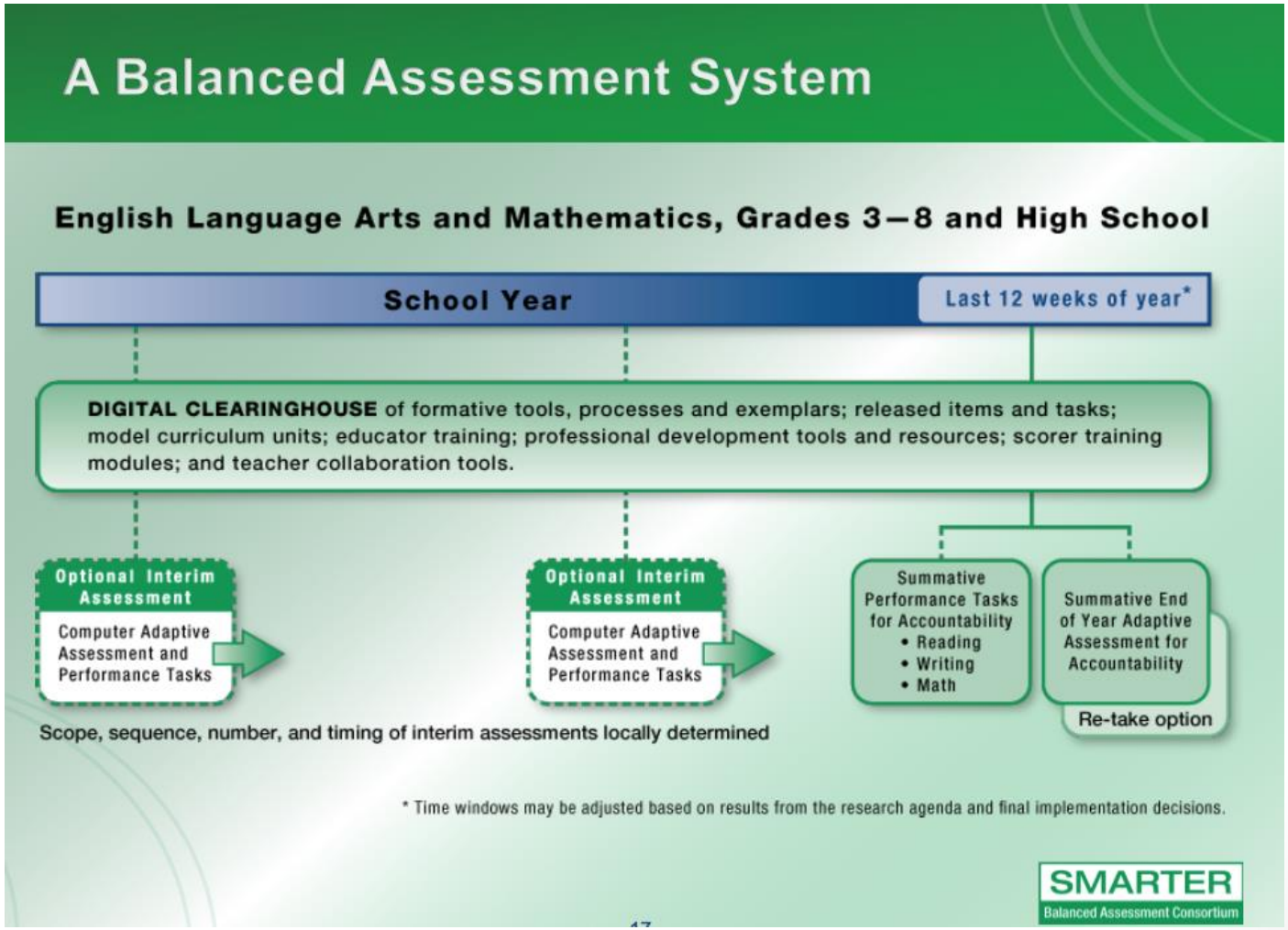
- 28 states representing 44% of K-12 students
- 21 governing, 7 advisory states
- Washington state is fiscal agent

SMARTER
Balanced Assessment Consortium

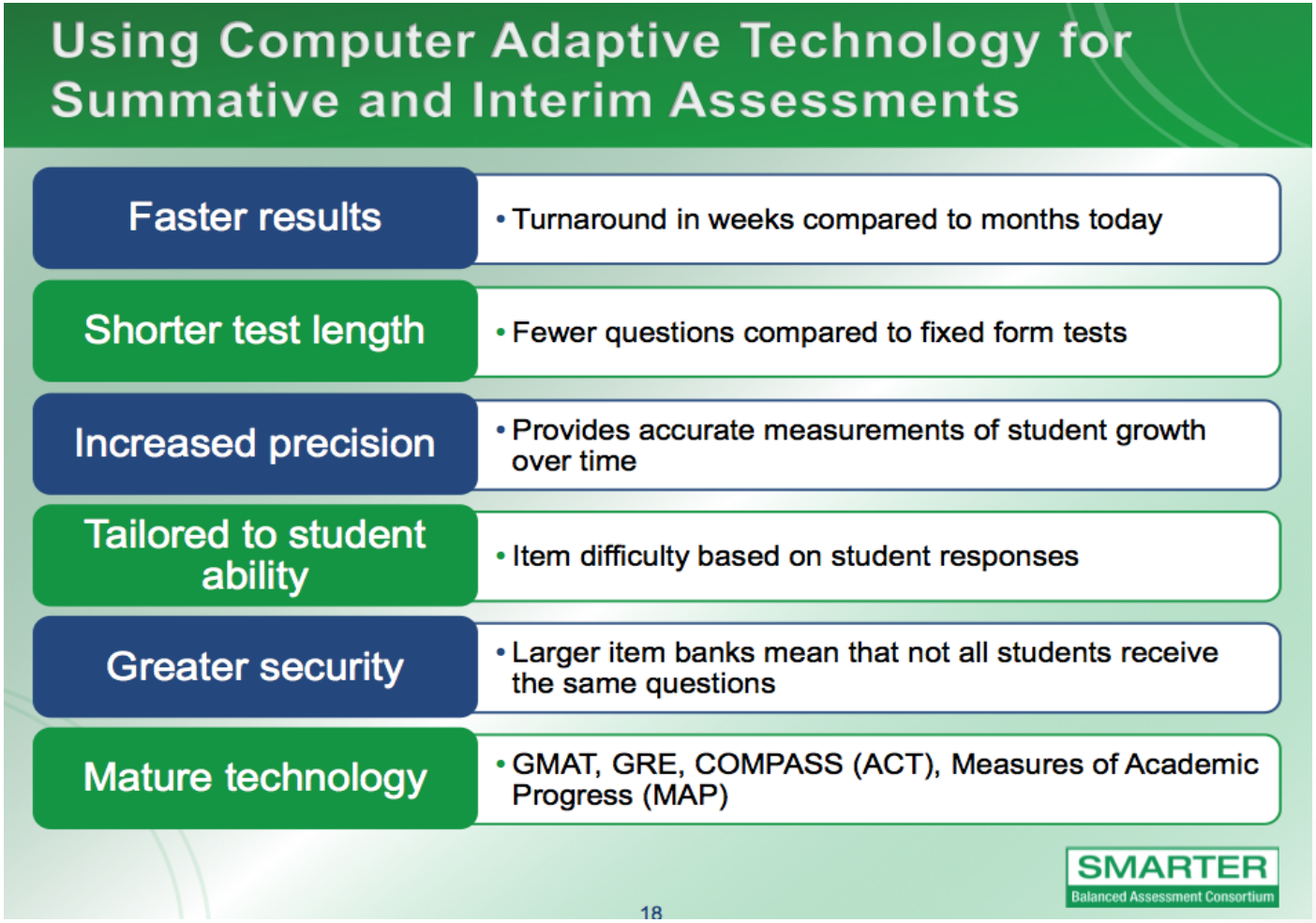
Smarter Balanced Assessment Consortium (SBAC)



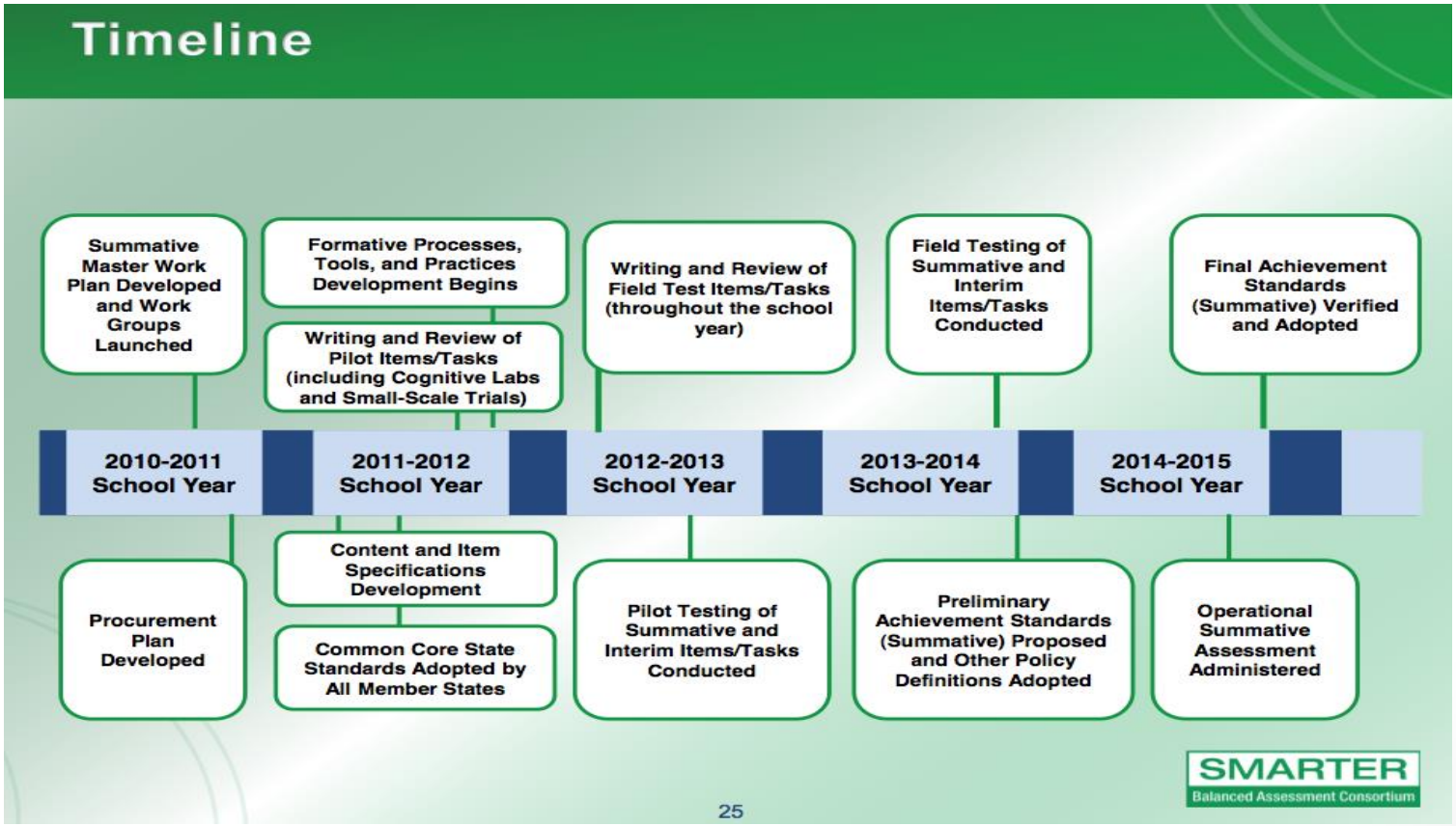
Smarter Balanced Assessment Consortium (SBAC)



Smarter Balanced Assessment Consortium (SBAC)



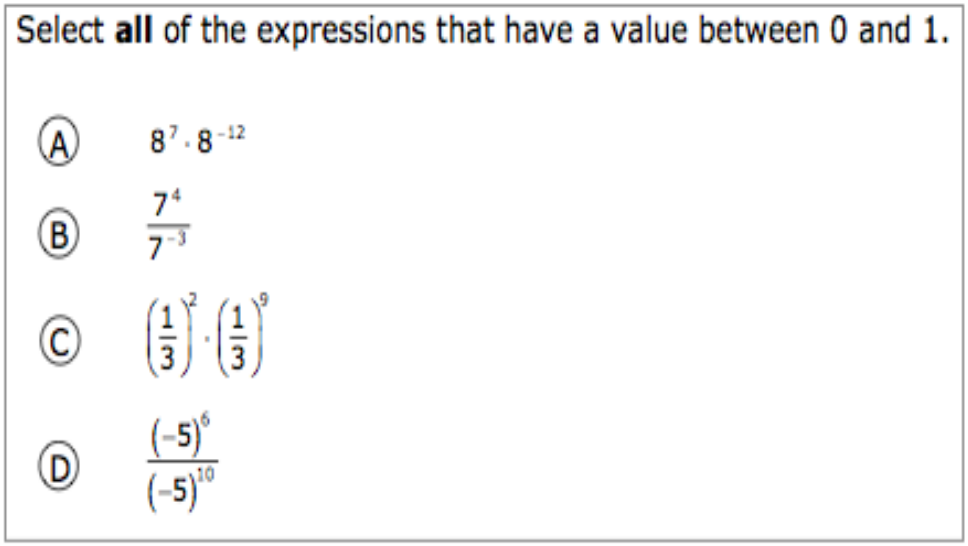
Smarter Balanced Assessment Consortium (SBAC)



New Types of Questions

- **Selected Response**
  - “multiple choices”
- **Constructed Response**
  - students answer without answer choices
- **Technology-Enhanced Items**
  - tools provided to answer questions
- **Performance Tasks:**
  - Complex
    - Depth of understanding
    - Student-initiated planning, management of data,
    - Real-world task or scenario

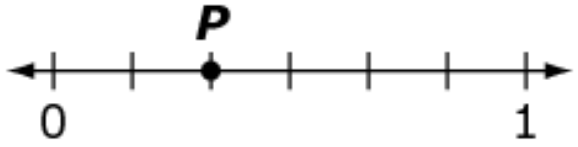
Selected Response Example



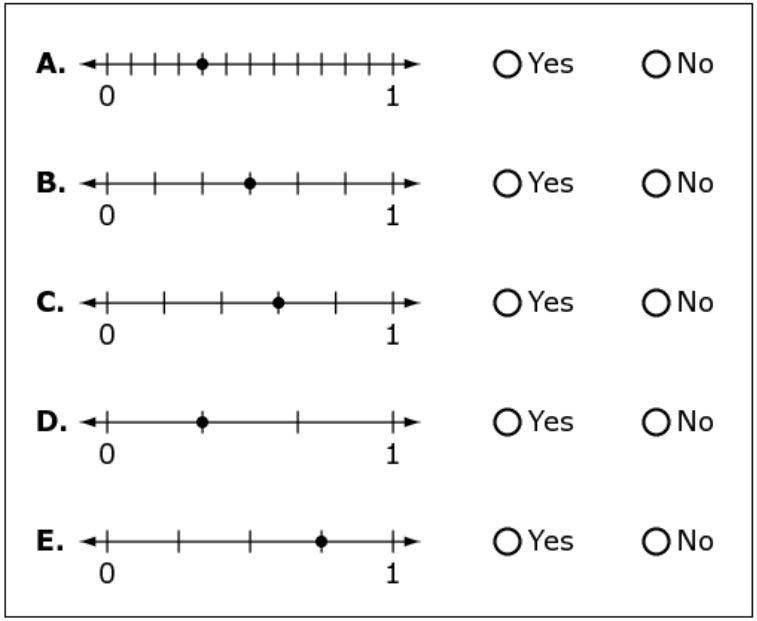
- Answer: A,C,and D
- 8th Grade
- Standard: Equations and Expressions
- Medium Difficulty
- Select one or more responses

Selected Response Example Grade 3

Look at point *P* on the number line.



Look at number lines A – E. Is the point on each number line equal to the number shown by *P*? Choose Yes or No.



4th Grade Constructed Response

A rectangle is 6 feet long and has a perimeter of 20 feet.

What is the width of this rectangle? Explain how you solved this problem.

4th Grade Constructed Response

Five friends ordered 3 large sandwiches.

James ate $\frac{3}{4}$ of a sandwich.

Katya ate $\frac{1}{4}$ of a sandwich.

Ramon ate $\frac{3}{4}$ of a sandwich.

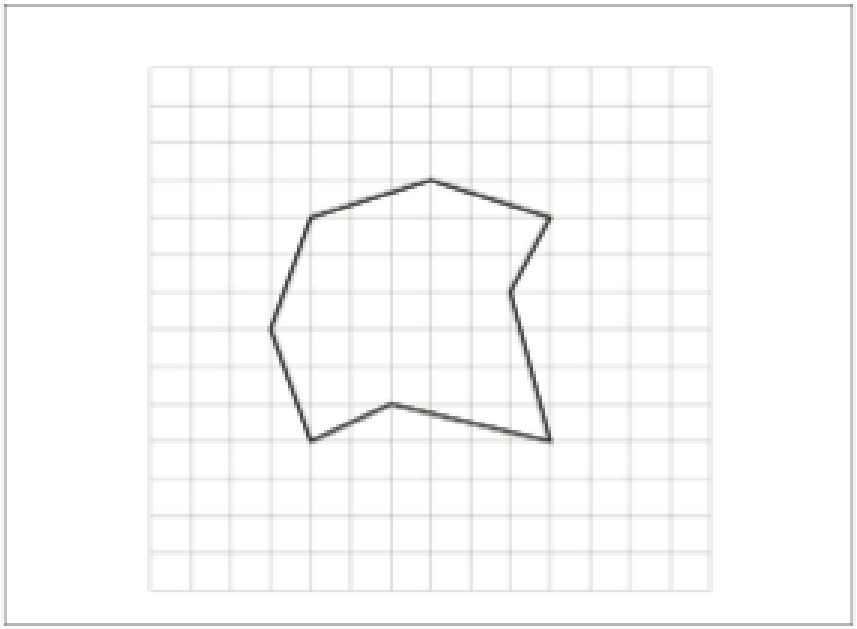
Sienna ate $\frac{2}{4}$ of a sandwich.

How much sandwich is left for Oscar?

1	2	3
4	5	6
7	8	9
0	.	/

Delete

Technology-Enhanced Items



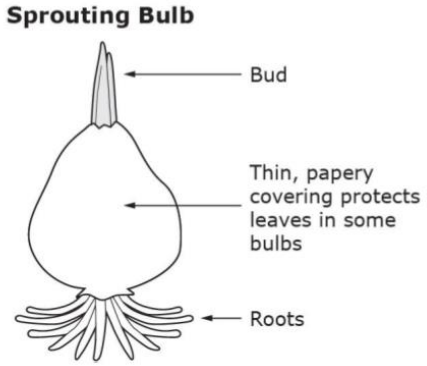
- 4th Grade
- Standard: Geometry
- Students draw line of symmetry
- Medium Difficulty

Draw a line of symmetry through the figure above.

Click on an intersection of grid lines to make the first point on the line. To make the second point, move the pointer and click on a different intersection of gridlines. The lines will automatically be drawn between the two points. If you make a mistake, click on the Clear button.

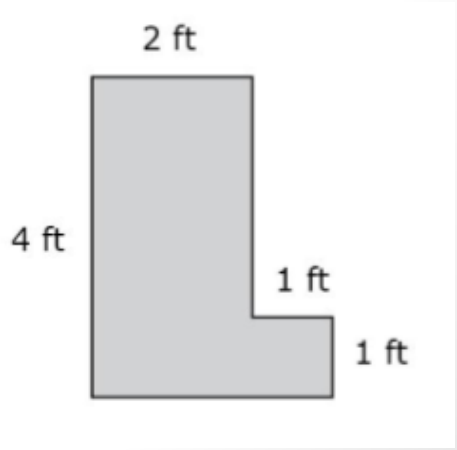
Performance Tasks

- Classroom Activity (4th Grade)
  - Sets Context – Planting Tulips for School
    - Bring in bulb examples
    - Measure bulbs
    - Calculate planting widths
- Task – 4 Parts
  1. Measurement units
  2. Digging Depth Explanation
  3. Calculate number of bulbs to plant and distance between bulbs
  4. Select best planter shape



Performance Tasks are assessing

- Problem solving with fractions & area
- Distinguishing correct logic from flawed
- Construct reasoning
- Select and use appropriate tools
- Apply mathematics to solve everyday problems
- Test conjecture with examples



The Challenge

- How much does it cost to cover this room in aluminum foil?

Reynolds Wrap Heavy Duty Aluminum Foil - 2/150 sq. ft. rolls

by Reynolds

(8 customer reviews) | Like (2)

List Price: ~~$36.99~~

Price: $27.56 Prime

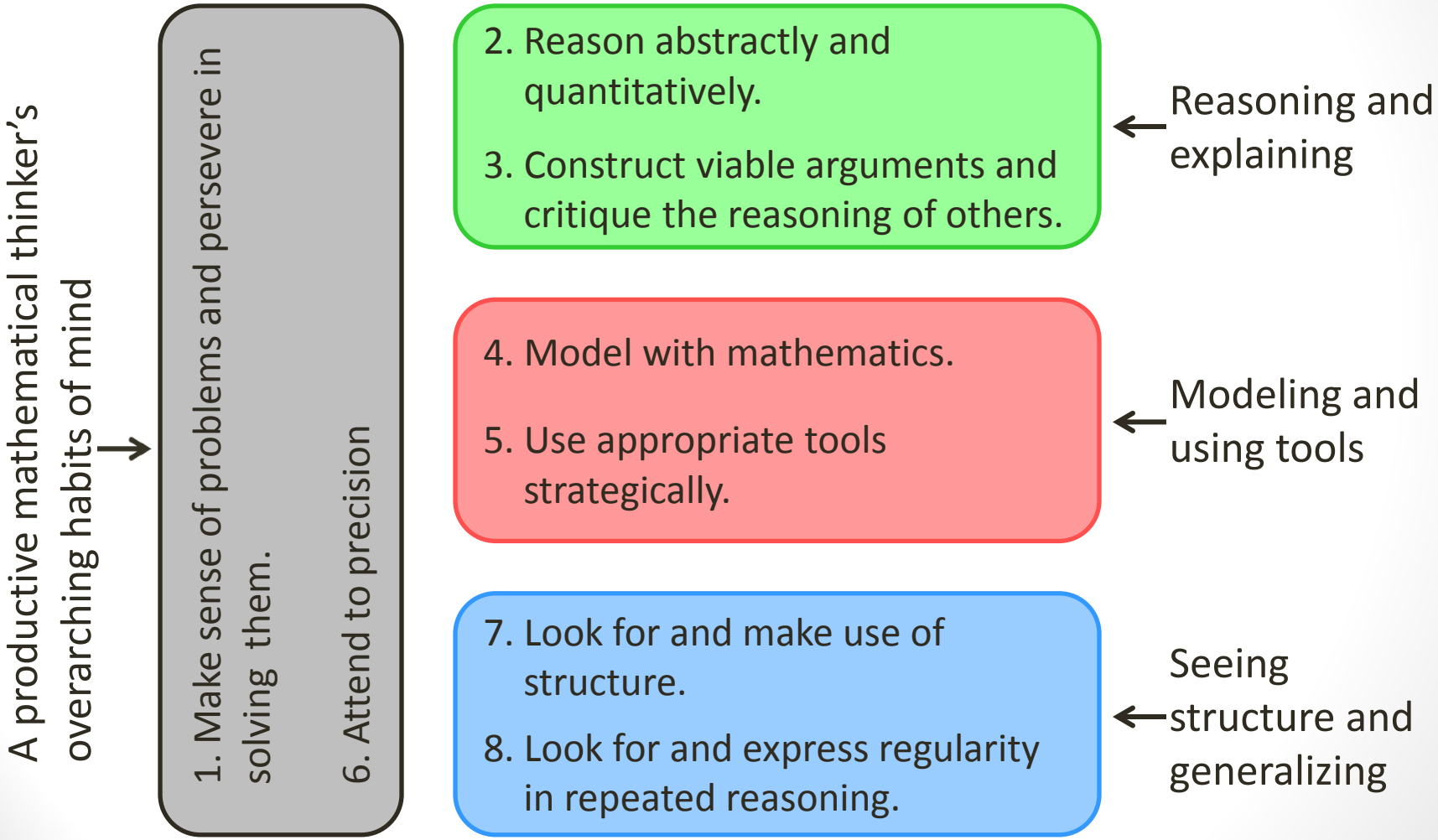
You Save: $9.43 (25%)

- 2/150 sq. ft. rolls
- Quality aluminum foil
- Heavy duty

Standards for Mathematical Practice

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.

Structuring the Standards for Mathematical Practice (SMP)



Source: Bill McCallum - http://bit.ly/LE12tM

Resources

- Handouts
  - Using Open-Ended Problems
  - Standards for Mathematical Practice in Action
  - Ideas for Math Lessons - aligned to Common Core Standards

- Common Core Standards:
  - www.corestandards.org
  - www.illustrativemathematics.org

- Problem Based Lessons
  - www.robertkaplinsky.com/lessons
  - illuminations.nctm.org 607 Lessons for preK-12

Thank You

- Robert Kaplinsky
  - rkaplinsky@dusd.net
  - @robertkaplinsky
  - www.robertkaplinsky.com

- Nancy O'Rode, Ph.D.
- MDE College of Education
- nancyo@csun.edu

Math Practices: Using Open-Ended Problems

Why Use Open-Ended Problems in Mathematics?

- Open-ended problems provide Multiple Entry Points for students
- Differentiate Instruction for many developmental levels
- Meet needs of both struggling learners and promising students who need challenges
- Maintains a level for all to succeed and ability to discuss mathematics

	Type of Open-Ended Problem	Example
1	Ask for more than one strategy	"Can you show two different ways to add 24 and 37?"
2	Show more than one representation	"Use numbers, pictures, and words to show your answer."
3	Require an explanation	"Please explain how you know you have the correct solution."
4	Ask for more than one solution	"Find three ways that the sisters can spend ten dollars."
5	Ask for a story problem and solution.	"Write a story problem using the numbers 3, 5, and 15. Solve the problem."
6	Begin with the answer and ask for possibilities.	"Find all the number combinations that make 16." Or "What are three different ways that Henry could spend $15 on carnival rides?"
7	Create many possibilities by using dice, number cards, or spinner.	"Use two dice and three number cards to make an addition problem. Solve the problem."
8	Put a constraint on the problem.	"The 5 key on the calculator is broken. How could you solve the problem without using the 5 key?" or "How could you find the area of a trapezoid without using the formula?"
9	Use a range of numbers in the problem.	"Use the numbers 5, 6, 7, and 8 to make as many addition problems as you can. Solve."
10	Use a developmental progression in the problem.	"First draw a picture of the shape, identify the shape by name, and describe the shape using as many properties as you can."
11	Connect problem situation to real world and ask for expertise.	"Design three different sized boxes to hold 24 chocolate candies. Tell which box is the best design and why."

Handout

Performance Tasks

2-Day Tasks

5th Grade

Geocaching

Geocaching is an indoor or outdoor treasure-seeking game. You can use different tools to find "treasure." A treasure seeker attempts to find the hidden treasure, or "geocache," by calculating the location using clues.

In this activity, a geocache is the hidden treasure that you must find using a set of clues. These clues will help you to determine the location of the geocache.

To complete this activity, you will:

- decipher the clues.
- create a map on a grid of where the geocache can be found.
- use the map to locate the geocache.
- locate new geocaches.
- create clues for a new geocaching task.

Grade 5 Mathematics Sample PT Claim 4

Balanced Assessment Consortium

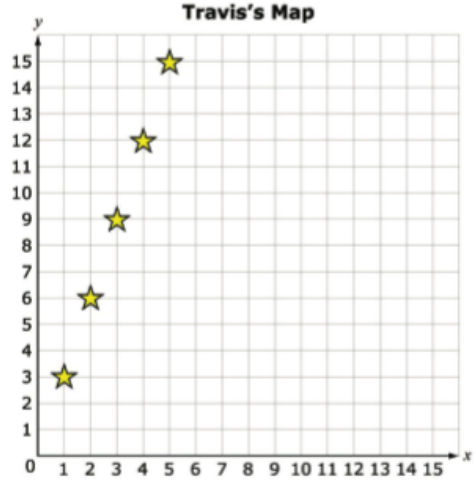
Session 2

[The teacher directs the students to either copy this information on the map created in *Part B* or print their map, as resources permit.]

Part C

Travis created the following map.

Travis's Map



Did Travis apply the clues correctly to determine the locations of the geocaches? Explain why or why not.

Version 1.0