Lessons Learned from Writing Smarter Balanced Performance Tasks

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Goals for this Session

Goals for our session:

- Features of the SB PT
- Sample SB PT
- Our current benchmark project
- Steps YOU can take to modify your current resources

Lessons Learned from Writing PTs

Assessment writing is difficult, enlightening, and humbling work

Being involved in the process of writing and developing performance tasks was valuable professional development for everyone involved

Results from performance task assessments are useful for both teachers and students

There are minimal resources on the current market that collect evidence of student mathematical thinking

Who We Are

Our Experience with Smarter Balanced

August 2015 - April 2016

10 State Project (The Curtis Center from UCLA had the other 10)

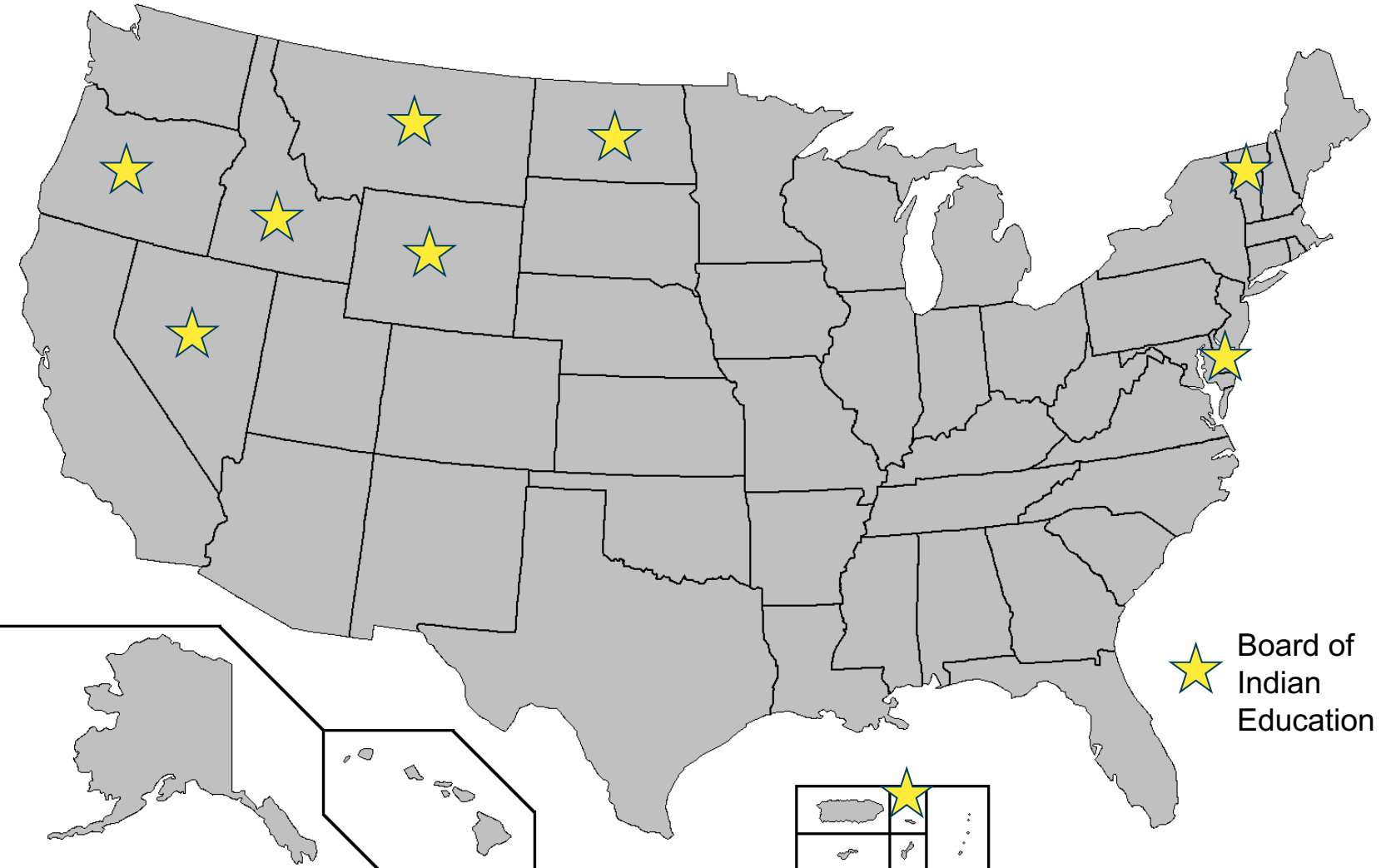
- 2 Goals
  - Design and Write High-Quality PTs
  - Build capacity and understanding of the PTs across the SB states

Teachers, TOSAs, Education Leaders from each state

3 Writing Cycles facilitated by a Callahan Consulting team member

1 PT per grade level (3 - 8, HS) per writing cycle (plus clones)

Our 10 States



Features of a Smarter Balanced PT

Claims 2, 3, and 4

Securely Held Content

Depth of Knowledge Level 2 or 3

Rigorous (this does not mean nasty numbers)

3 - 6 Items where the first item is a ramp

What are the Claims?

Claim 1

Claim 2

Claim 3

Claim 4

The CAT items are used to measure student proficiency of grade level content (focus on Claim 1) while the PT is designed to collect evidence of Claims 2, 3, and 4 using securely held content

What does “Securely Held Content” mean?

Sample Performance Task

5th Grade

Please take a few minutes to try these items on your own

Clay Pottery

Lizzie and Zela are interested in making pottery. The following chart shows how much clay is needed to make different projects.

Project	Pounds of Clay Needed
 Small Plate	$2\frac{1}{2}$
 Small Bowl	$1\frac{1}{2}$
 Large Bowl	$3\frac{1}{4}$
 Dinner Plate	$4\frac{1}{2}$
 Mug	$\frac{3}{4}$

Please Share

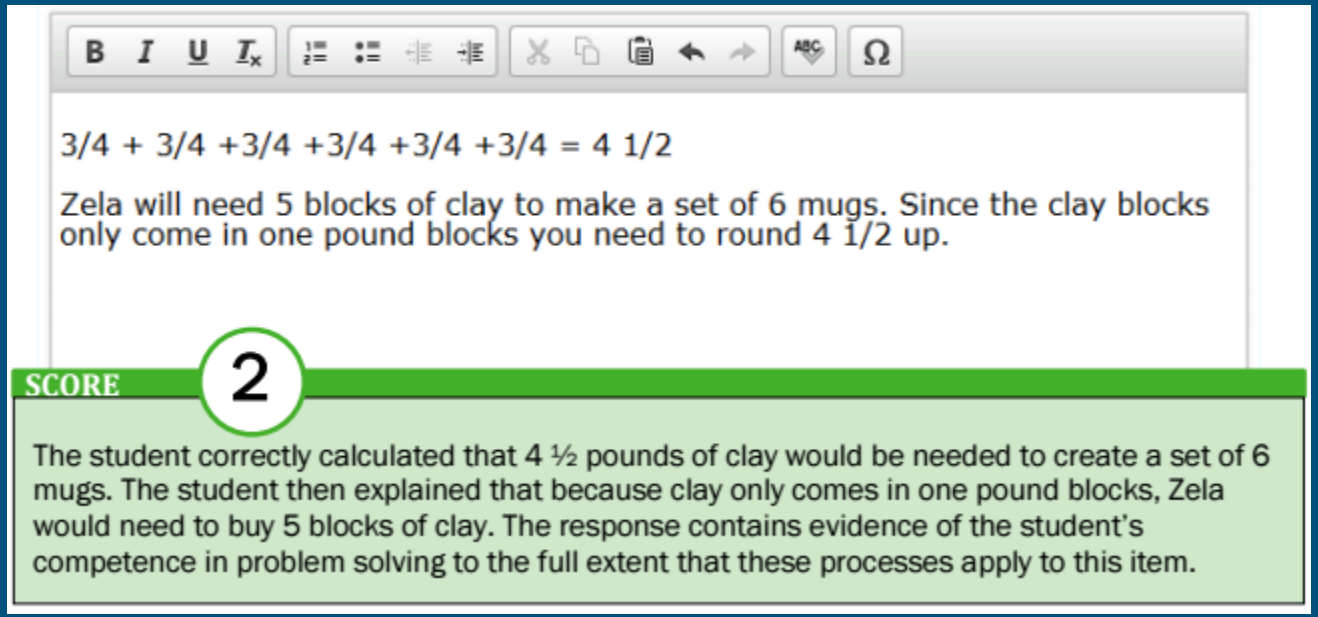
What do you notice about the items?

Do you have questions or ideas about the Claims?

Does the content seem securely held?

What evidence do these items collect about student mathematical understanding? How do they compare to a decontextualized addition of fractions problem?

Looking at Student Work: Item 3, Claim 4



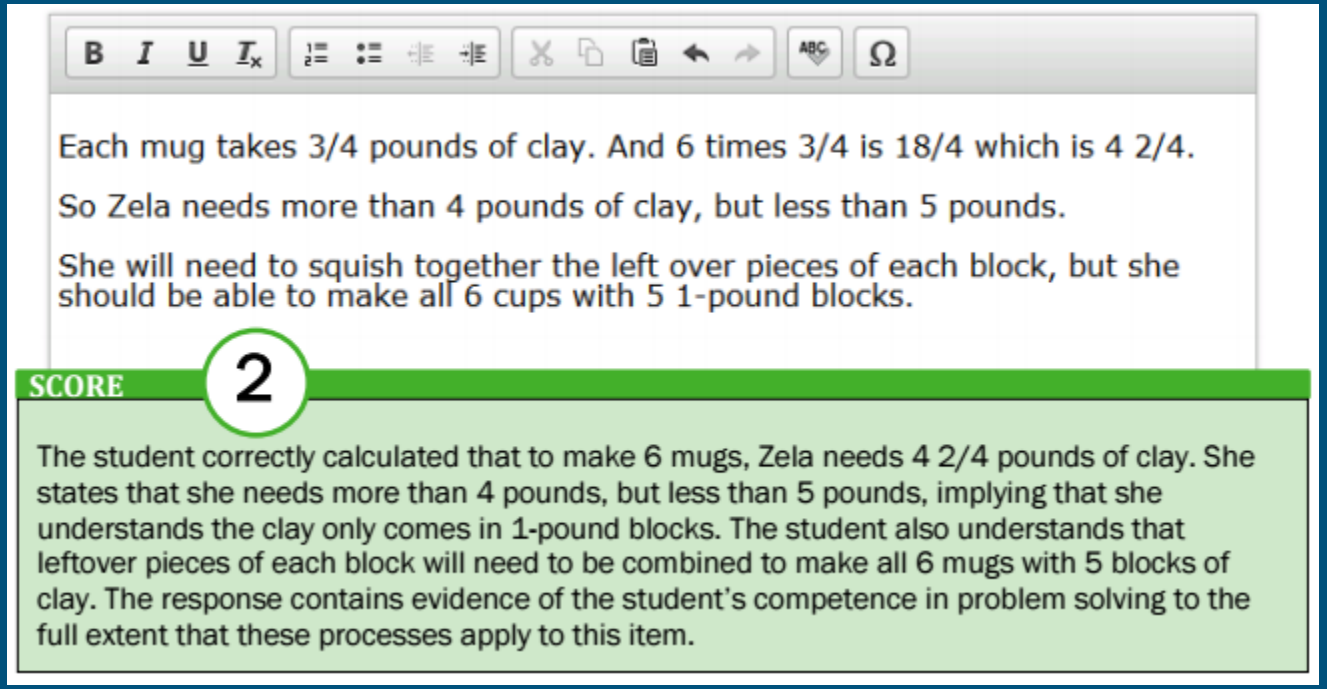
3/4 + 3/4 +3/4 +3/4 +3/4 +3/4 = 4 1/2

Zela will need 5 blocks of clay to make a set of 6 mugs. Since the clay blocks only come in one pound blocks you need to round 4 1/2 up.

SCORE 2

The student correctly calculated that 4 ½ pounds of clay would be needed to create a set of 6 mugs. The student then explained that because clay only comes in one pound blocks, Zela would need to buy 5 blocks of clay. The response contains evidence of the student's competence in problem solving to the full extent that these processes apply to this item.

Looking at Student Work: Item 3, Claim 4



Each mug takes 3/4 pounds of clay. And 6 times 3/4 is 18/4 which is 4 2/4.

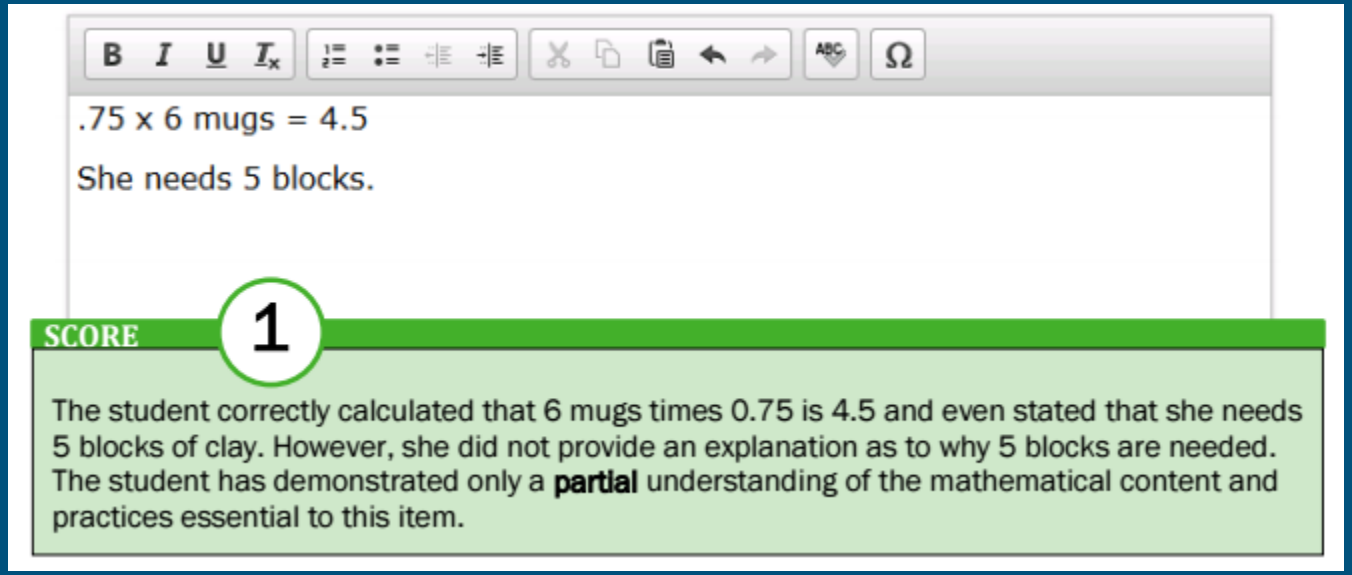
So Zela needs more than 4 pounds of clay, but less than 5 pounds.

She will need to squish together the left over pieces of each block, but she should be able to make all 6 cups with 5 1-pound blocks.

SCORE 2

The student correctly calculated that to make 6 mugs, Zela needs 4 2/4 pounds of clay. She states that she needs more than 4 pounds, but less than 5 pounds, implying that she understands the clay only comes in 1-pound blocks. The student also understands that leftover pieces of each block will need to be combined to make all 6 mugs with 5 blocks of clay. The response contains evidence of the student's competence in problem solving to the full extent that these processes apply to this item.

Looking at Student Work: Item 3, Claim 4



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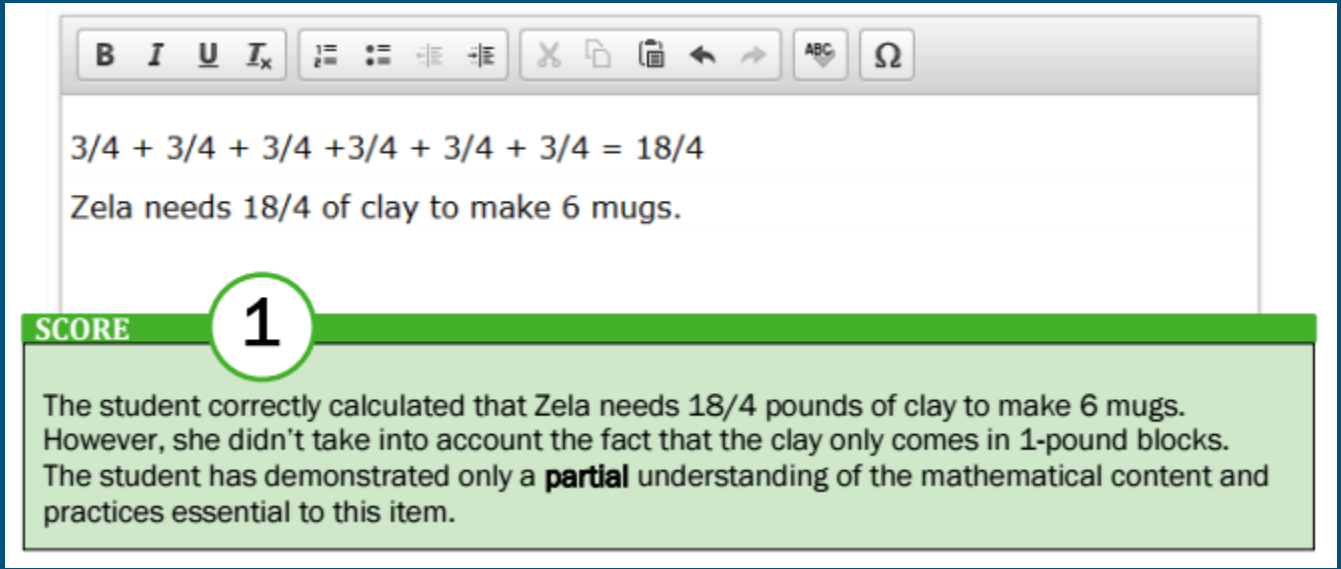

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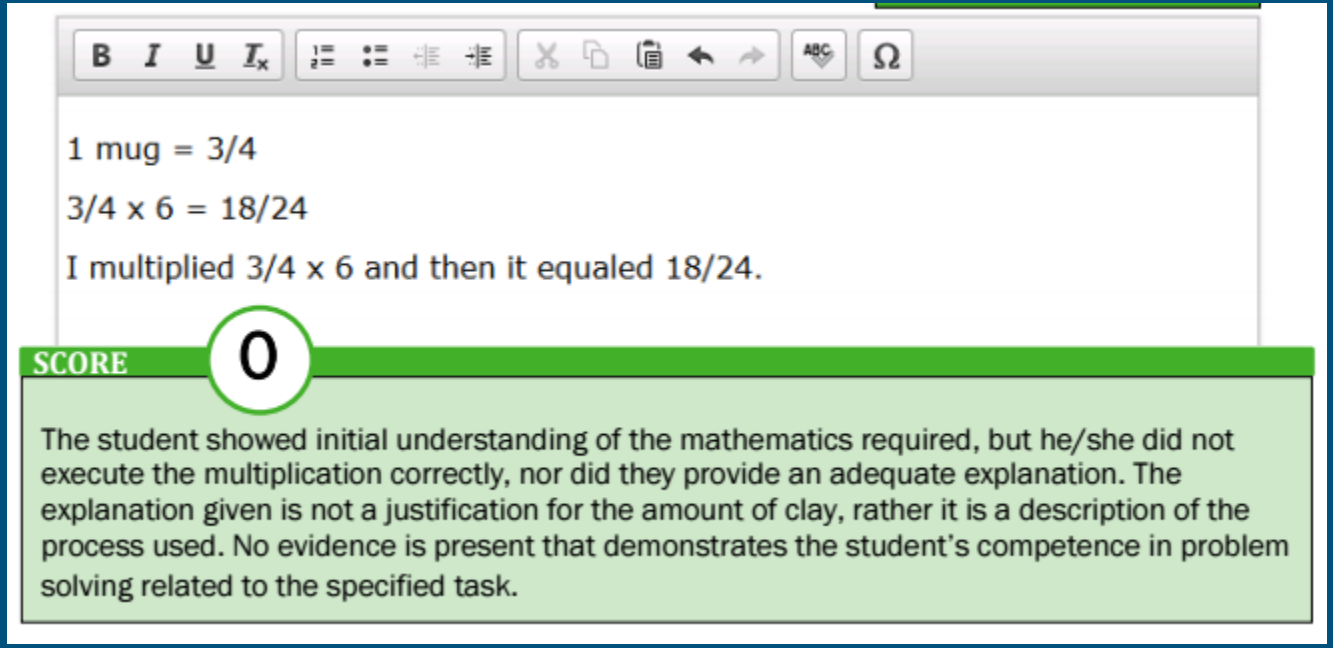

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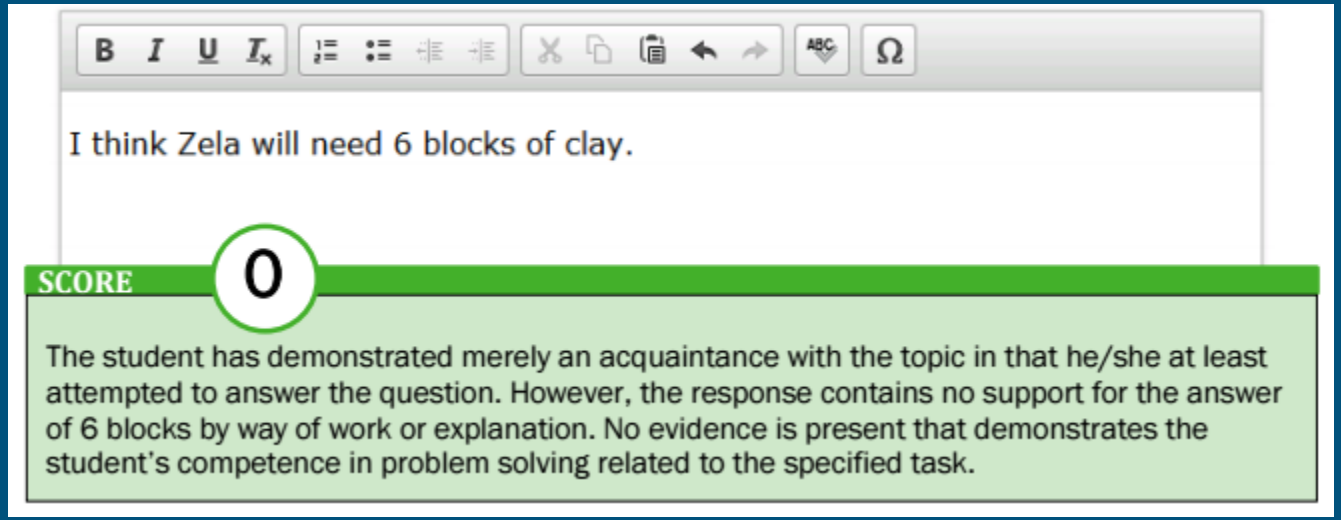

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Our Current Work

Developing benchmark assessments that prioritize problem solving, communicating reasoning, and mathematical modeling for schools and districts around the world

Working to better align curriculum, instruction, and assessment with teachers and administrators

What Can You Do Now?

Strategies for revising current textbook questions and/or assessment items:

Think about the quality of the mathematical evidence

Ask yourself: Is this important? Do we really care if a student can answer this question? What does it show us about a student's understanding of mathematics?

Is the question/premiss authentic?

Ask yourself: When would kids authentically encounter this content?

What would a student really ask or do?

Claim 1 versus Claim 2: Let's Cause Problems

Claim 1 Questions involve applying a known procedure in a familiar way

For Example: Find the solution to $|x + 3| < 8$

So, how can we make it more Claim 2?

Claim 2 Modification: Give *two different* inequalities involving absolute value that both have the solution set $\{2 < x < 4\}$

Claim 1 versus Claim 2: Let's Cause Problems

Claim 1 Example: $\frac{2}{5} + \frac{3}{5} = ?$

Claim 2 Modification: Name two fractions with denominator of 5 that sum to 1

Claim 1 Example: Define *rhombus*

Claim 2 Modification: Draw a *rhombus* with a perimeter of 24 cm that is not a square

Claim 1 Example: What is 168 x 95?

Claim 2 Modification: If $1A8 \times 95 = 159A0$, what is the value of A?

Claim 1 versus Claim 3: Let's Talk About Reasoning

Take advantage of misconceptions

Claim 1 Example: How many inches is 5 ½ feet

Claim 3 Modification: Members of your class went home and measured the lengths of their couches. Here are four lengths that your classmates measured:

Candice: 4 feet

Jasper: 62 inches

Paula: 1 ½ yards

Antonia: 5 feet, 3 inches

Jasper says that his couch is surely the largest because 62 is the largest of the numbers. Do you agree or disagree with Jasper? Explain your reasoning.

(Not a good) Claim 3: Susan claimed that 5 ½ feet is equivalent to 300 inches. Do you agree or disagree with Susan? Explain your reasoning.

Give it a Shot! Pick one of the following Claim 1 items and try to bump it up to Claim 2 or Claim 3. Be prepared to share.

K-2 Question: $3 + \square = 5$

3-5 Question: Compare the fractions: $\frac{2}{3}$ $\frac{1}{2}$

6-8 Question: $\frac{3}{7} = \frac{x}{21}$

HS Question: Find the slope of the line that is parallel to

$$y = \frac{2}{3}x - 8$$

Claim 4: Mathematical Modeling

The Difference Between Problem Solving and Mathematical Modeling

Strategy #1: Is the Information There?

If you answered *Yes* to this question, it's probably a Problem Solving question

If you answered *No*, it's probably a Modeling question

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Version A: A typical page has 450 words. A typical book has 250 pages. How many books would you need to read to reach one million words?

Version B: You are challenged to read one million words this year. How many books would you need to read to reach that goal?

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Strategy #2: Design Under Constraints

Many authentic real-life problems do not have one answer. There can often be several possible solutions and the “best” may depend on the assumptions made.

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Version A: For your birthday party, you want to watch a movie, play chess, eat cake, and open presents. The party is from 4 to 7 pm. If you need 45 minutes for playing chess, 1:40 for the movie, and 20 minutes for opening presents, how much time is left for eating cake?

Version B: You are planning your birthday party! You want to watch a movie, play chess, eat cake, and open presents. The party starts at 4 and has to end at 7pm. Make a schedule for your birthday party!

The Difference Between Problem Solving and Mathematical Modeling

Strategy #3: Compare Models

One important aspect of modeling is to compare and verify models

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Version A: Your job pays you $9 per hour plus a $50 bonus. How many hours would it take for you to earn $1000?

Version B: Which would you prefer? $9 per hour and a $50 bonus OR $12 per hour and a $25 bonus? Why?

Version C: Your boss says that instead of paying you $9 per hour and a $50 bonus, he will pay you a higher amount per hour and NO bonus. How much of an hourly raise should you ask for? Why?

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Strategy #4: Critical Consumer/Myth Buster

We are often confronted with claims that seem hard to believe, either by ads, politicians, or peers. Mathematical modeling is a way to “fact check” some claims.

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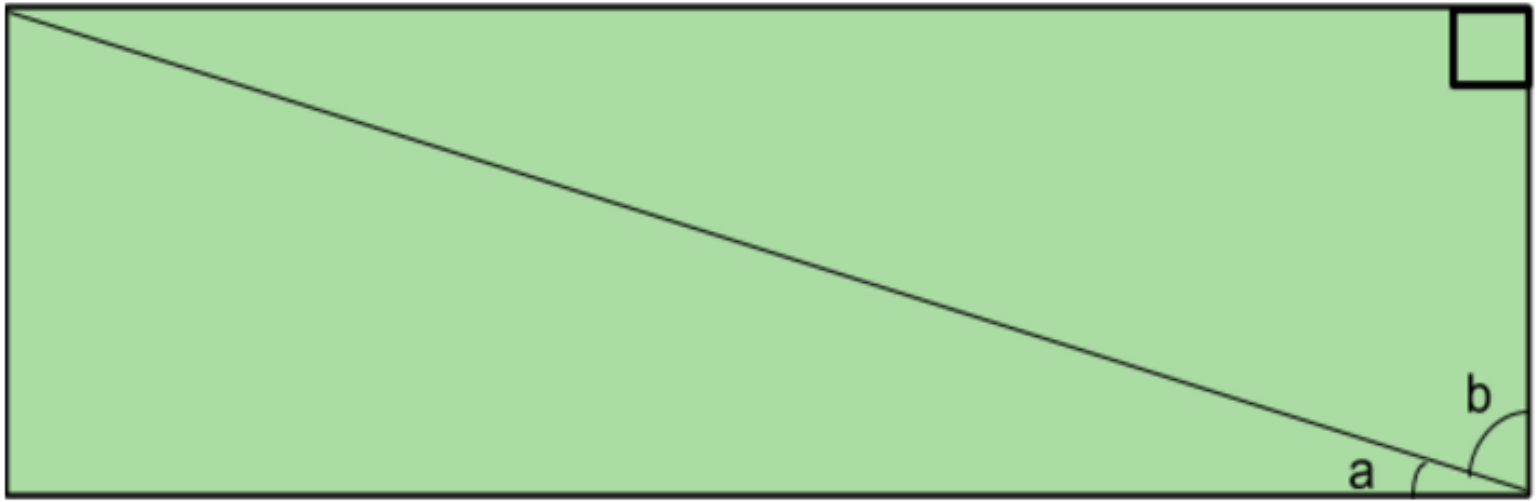
Example: According to Wikipedia, 8% of Americans eat at McDonalds everyday! Do you believe this?

Example: Your friend Josh says he loves hot dogs. He has kept count of every hot dog he has eaten since he was a baby. He says that he just ate his 100,000th hot dog! Do you believe him? WHy or why not?

Give it a Shot! Take this Claim 2 item and try and bump it up to a Claim 4.

Your rectangular school playground has been divided diagonally.



If you know the measure of angle a is 32 degrees, what is the measure of angle b?

Thank You!

Please feel free to contact us if you have any questions, comments, or concerns:

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