



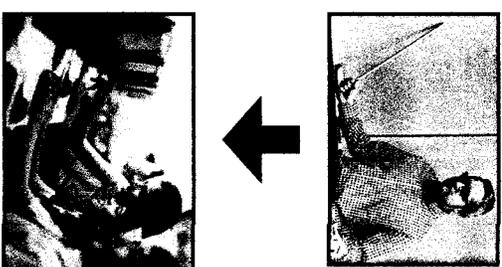
Grades 6-12

**Explore the PARCC Math Assessment and
Identify Effective Instructional Strategies**

Robyn Silbey

www.robynsilbey.com ♦ robyn@robynsilbey.com

- Examine several PARCC items
- Analyze the items for commonalities
- Identify instructional implications for “teaching to the test”
- Create an action plan for implementing the instructional implications



The
shift in job growth
requires a
shift in learning,
which can be
accomplished only if
we make a
corresponding
shift in instruction.

Introduction: UNDERSTANDING MATHEMATICS



Mathematical understanding and procedural skill are equally important, and both are assessable using mathematical tasks of sufficient richness.

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.



- identifies the “big ideas” in the Common Core State Standards for each grade level.



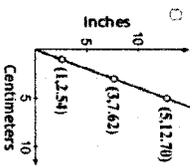
- provides guidance to teachers for the development of instructional materials.

<http://parconline.org/samples/item-task-prototypes>

Grade 6, Part 2 of 2

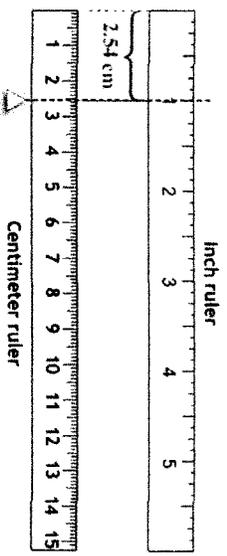
If we say that the relationship between the number of inches and the number of centimeters is exact, which of the following correctly represents the relationship? Select all that apply.

- $i = 2.54c$, where i stands for the number of inches and c stands for the number of centimeters
- $c = 2.54i$, where c stands for the number of centimeters and i stands for the number of inches
- The ratio of centimeters to inches is 1 to 2.54.
- The ratio of centimeters to inches is 2.54 to 1.



Grade 6, Part 1 of 2

The diagram shows that 1 inch is approximately equal to 2.54 centimeters. Drag the slider to explore this relationship and then answer the question below.



Grade 7

A restaurant makes a special seasoning for all its grilled vegetables. Here is how the ingredients are mixed:

- $\frac{1}{2}$ of the mixture is salt
- $\frac{1}{3}$ of the mixture is pepper
- $\frac{1}{5}$ of the mixture is garlic powder
- $\frac{1}{5}$ of the mixture is onion powder

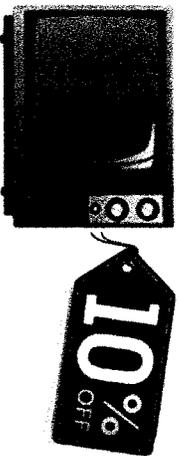
The restaurant mixes a 12 cup batch of the mixture every week. How many cups of each ingredient do they use in the mixture each week?

- cups salt
- cups pepper
- cups garlic powder
- cups onion powder

Grade 7, Part 1 of 2

A store is advertising a sale with 10% off all items. Sales tax is 5%.

A 32-inch TV is regularly priced at \$295. What is the total price of the TV, including sales tax, if it was purchased on sale? Round your answer to the nearest cent.



Grade 7, Part 2 of 2

Write your answers to the following problem in your answer booklet.

A store is advertising a sale with 10% off all items in the store. Sales tax is 5%. Adam and Brandi are customers discussing how the discount and tax will be calculated.

Here is Adam's process for finding the total cost for any item in the store.

- Take 10% off the original price.
- Then, add the sales tax to the discounted price.

Adam represents his process as:

$$T = \underbrace{0.9p}_{\text{sale price}} + \underbrace{0.05(0.9p)}_{\text{sales tax}}$$

Here is Brandi's process for finding the total cost for any item in the store.

- Determine the original price of the item, including sales tax.
- Then, take 10% off.

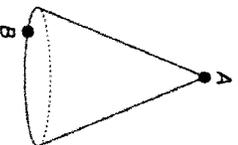
Brandi represents her process as:

$$T = \underbrace{1.05p}_{\text{TV price plus tax}} - \underbrace{0.1(1.05p)}_{\text{10% off discount}}$$

In both equations, T represents the total cost of the television and p represents the regular price. Are they both correct? Use the properties of operations to justify your answer.

Grade 8

A right circular cone is shown. Point A is the vertex of the cone and point B lies on the circumference of the base of the cone.



The cone has a height of 24 units and a diameter of 20 units. What is the distance from point A to point B?

High School

A rabbit population can increase at a rapid rate if left unchecked. Assume that 10 rabbits are put in an enclosed wildlife ranch and the rabbit population triples each year for the next 5 years, as shown in the table.

Year	Rabbit population
0	10
1	30
2	90
3	270
4	810
5	2430

Let y represent the number of rabbits after x years. Drag the tiles to the appropriate slots to build a function rule that could be used to model y as a function of x , where x is a non-negative integer.

$y =$

High School

Isabella owes a balance of \$300 on her credit card. She has stopped making purchases with the card, and she plans to make a \$40 payment each month until her debt is paid and her credit card balance is \$0. The monthly rate is 1.5%, and interest is added each month to the balance that remains.

Read the next three slides for Parts 1-3.

High School, Part 2 of 3

Fill in the blanks to correctly complete the spreadsheet. Use dollar amounts written as decimals rounded to the nearest cent.

A	B	C	D	E
Month	Amount owed (\$)	Monthly payment (\$)	Remaining amount owed after payment (\$)	Amount owed after 1.5% interest charge(\$)
1	300.00	40.00	260.00	263.90
2	263.90	40.00		
3		40.00		
4				

High School, Part 1 of 3

Consider the spreadsheet. Each entry cell is referred to by its column letter and row number. For example, \$260.00 is the entry in cell D2 of this spreadsheet.

A	B	C	D	E
Month	Amount owed (\$)	Monthly payment (\$)	Remaining amount owed after payment (\$)	Amount owed after 1.5% interest charge(\$)
1	300.00	40.00	260.00	263.90
2	263.90	40.00		
3				

Drag the tiles to write a formula to find the value of cell D3.

D3 =

Drag the tiles to write a formula to find the value of cell E3.

E3 =

High School, Part 3 of 3

Fill in the blanks based on your calculations. Use dollar amounts written as decimals rounded to the nearest cent.

At the end of the sixth month, how much will Isabella still owe on the credit card?

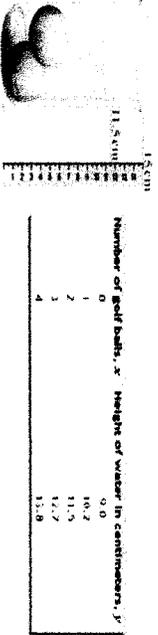
\$

Isabella will finish paying off her credit card debt in months.

What is the amount of Isabella's last payment?

\$

High School, Part 1 of 3
 Tom is doing an experiment adding golf balls to a jar with water. The picture and the table show what happens to the height of the water as Tom adds golf balls.



Drag tiles to complete the sentences, and the equation below, based on the results of Tom's experiment.

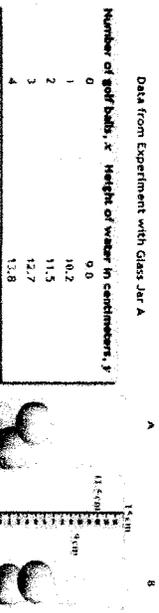
golf balls	change	glass jars	water height
1, 2	1, 3	9, 0	12, 0
			13, 8

The height of the water changes at an average rate of about _____ centimeters per golf ball. If these data were graphed with the number of golf balls as the independent variable, the y -intercept for the graph would be about _____ centimeters. This means that for zero _____, the _____ is y centimeters. Tom's table and graph can be represented by the trend line with the equation $y = \square + \square x$.

High School, Part 3 of 3

Write your answers to the following problem in your answer booklet.

Tom repeats his experiment with a different glass jar. The new glass jar, B, has a smaller radius than the original glass jar, A.



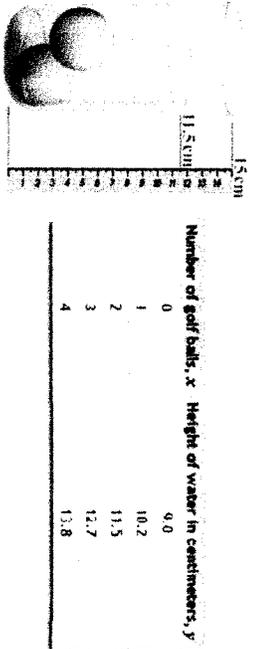
Tom forgot to write down the initial height of the water in glass jar B, but he measured the water height at 9 centimeters after adding two golf balls.

Question a: When Tom creates graphs of the data from both experiments, how will the y -intercepts of the graphs be different for glass jar A versus glass jar B? Explain how you know.

Question b: How will the rate of change in the experiment using glass jar B be different than the rate of change in the experiment using glass jar A? Explain how you know.

Question c: Suppose glass jar B has a water height of 5 centimeters with no golf balls, and the water height increases at a rate of 2 centimeters per golf ball added. Tom continues to add golf balls to each glass jar. He discovers that there is a number of golf balls at which the height of the water in each glass jar is the same. How many golf balls will be in each jar when the water in each reaches the same height?

High School, Part 2 of 3



There are several ways that Tom could modify the conditions of his experiment. What modifications would increase the rate of change in the height of the water level with respect to the number of golf balls? Select all that apply.

- Use larger golf balls
- Decrease the diameter of the glass jar
- Drop the golf balls into the glass jar at a faster rate
- Add 5 cm of water to the glass jar
- Drop the golf balls into the glass jar two at a time

