



# 2018 Next Generation MCAS

Mary Lou Beasley  
Grades 3-5 Math Test Development Specialist

ATMIM Winter Conference, January 23, 2018

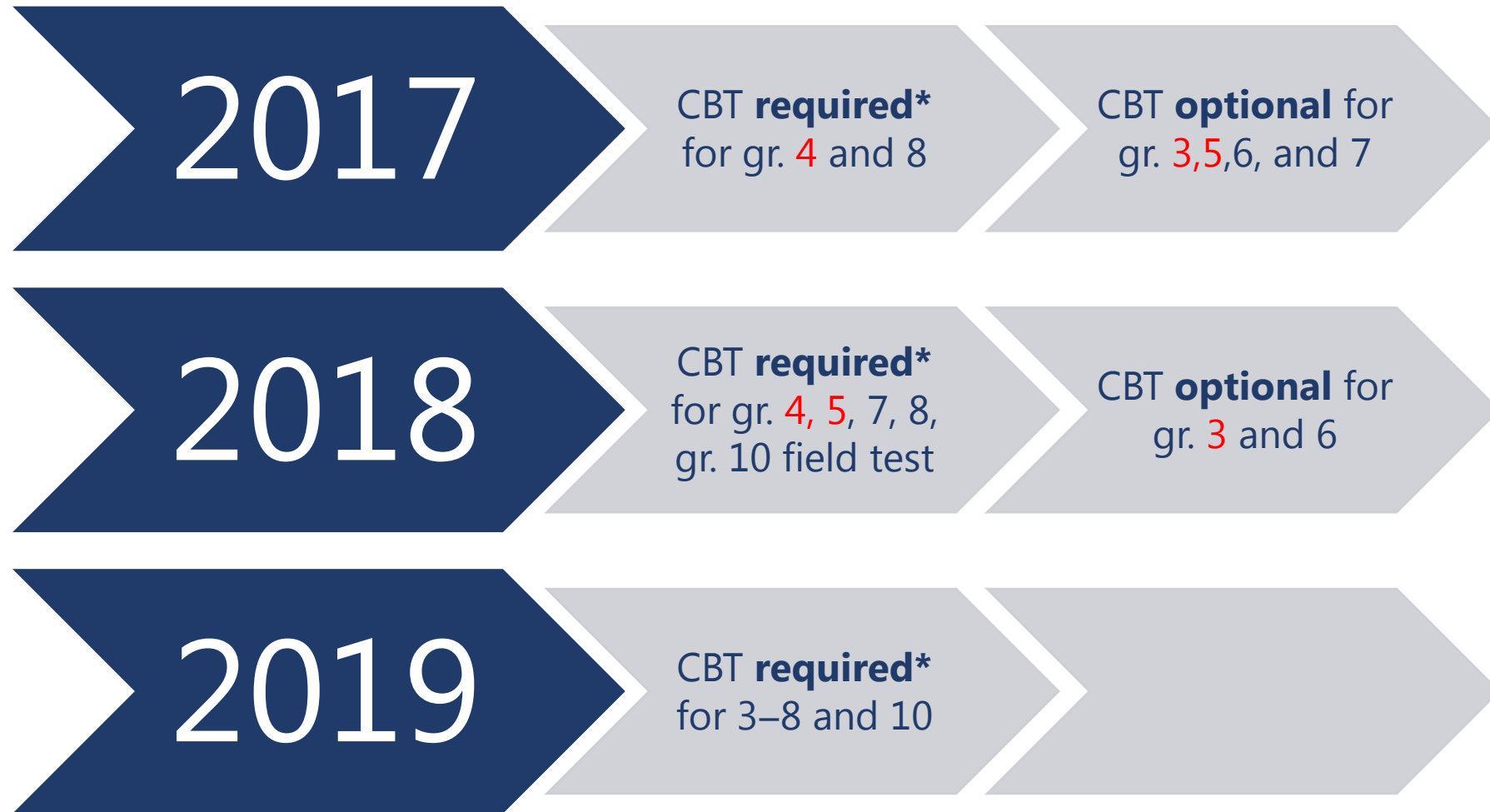


# Agenda

- Grades 3-5 Transition to Computer-based testing
- Test Design
- Reporting Categories
- Question Types
- Answering a Short-Answer Question
- Answering a Constructed Response Question
- Online Tools
- Accessibility vs. Accommodations
- Resources



# Transition to Next-Generation Tests for Mathematics



\* Paper-based testing will be available for **students with disabilities** who require a paper-and-pencil test as well as for new **EL students** unfamiliar with computers.

# Test Design - Operational/Common Questions

## Grade 3

- 36 one-point questions
- 4 constructed response questions
- 48 total points

## Grade 4-5

- 34 one-point questions
- 2 two-point questions
- 4 constructed response questions
- 54 total points



# Test Design - Matrix (Field Test and Equating) Questions

## Grade 3

- 3 additional one-point questions
- 1 additional constructed-response question.

## Grades 4-5

- 3 additional one- or two-point questions
- 1 additional constructed - response question.

# Reporting Categories

<b>Reporting Category Percentages (+/-5%)</b>	<b>Grade 3</b>	<b>Grade 4</b>	<b>Grade 5</b>
<b>Operations &amp; Algebraic Thinking</b>	30%	20%	15%
<b>Number &amp; Operations in Base Ten</b>	15%	20%	30%
<b>Number &amp; Operations-Fractions</b>	20%	30%	25%
<b>Measurement &amp; Data</b>	25%	20%	20%
<b>Geometry</b>	10%	10%	10%

# Question Types

Question Type	Total Points	Grade Levels
<b>Multiple Choice</b> <i>Students select one correct answer from among several answer options.</i>	1	3-5
<b>Multiple Select</b> <i>Students select more than one correct answer from among several answer options.</i>	1	3-5
<b>Technology Enhanced</b> <i>Students taking the computer-based tests answer questions using technology such as drag-and-drop and hot spot.</i>	1	3
	1 or 2	4 - 5
<b>Short Answer/Fill-in-the-Blank</b> <i>Students construct a short written response, typically only a word or a number.</i>	1	3-5
<b>Constructed Response</b> <i>Students write a response to a multi-part item that includes calculations and explanations to a problem or set of problems</i>	3	3
	4	4 - 5



# Multiple-Choice Question

Which of the following expressions represents the number *one million*?

A.  $10^8$

B.  $10^7$

C.  $10^6$

D.  $10^5$

5.NBT.A.2



# Multiple-Select Question

Which **two** ways show how to find the value of  $7 \times 40$ ?

Select the **two** correct answers.

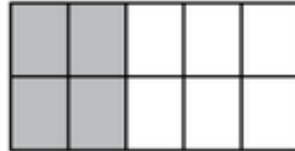
- A.  $7 \times 4$
- B.  $4 \times 10$
- C.  $7 \times 4 \times 10$
- D. 7 groups of 4 ones
- E. 7 groups of 4 tens

3.OA.B.5



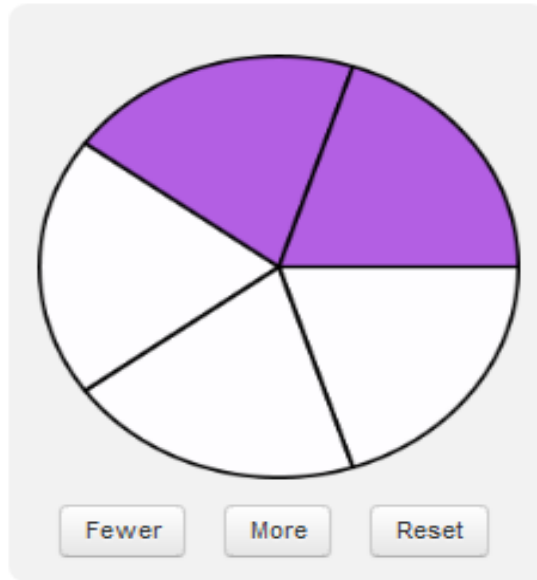
# Technology Enhanced Question – Fraction Model

The shaded part of this rectangle represents  $\frac{4}{10}$ .



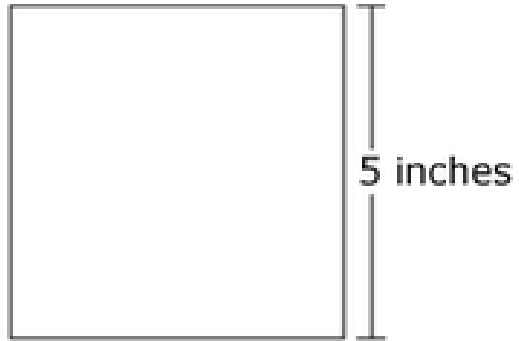
Create a fraction model to show an equivalent fraction with a denominator of 5. Shade the fraction of the model that represents the equivalent fraction.

Divide the figure into the correct number of equal parts by using the More and Fewer buttons. Then shade by selecting the part or parts.



# Technology Enhanced Question - Match Table Grid

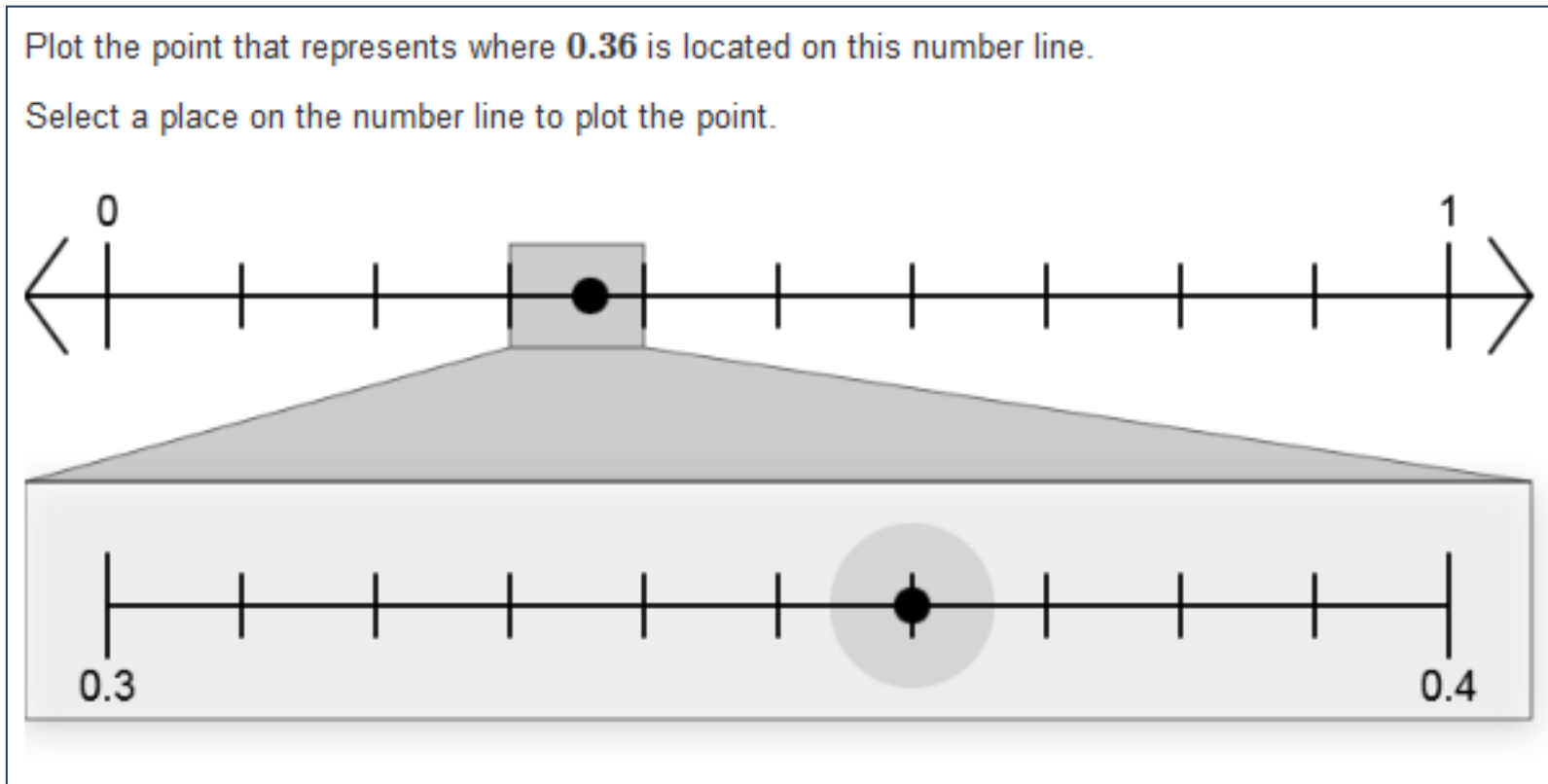
A builder is using square tiles to make a design in the shape of a square in a kitchen. Each tile is the same size. One of the square tiles and its measurement is shown.



Select "True" or "False" in the table for each statement about the square tile.

Statement	True	False
The length of each side of the square tile is 5 inches.	<input checked="" type="radio"/>	<input type="radio"/>
The area of the square tile is 25 square inches.	<input checked="" type="radio"/>	<input type="radio"/>
The design will have an area of 85 square inches. The builder will need 4 of the square tiles to make the design, without gaps or overlaps.	<input type="radio"/>	<input checked="" type="radio"/>

# Technology Enhanced Question – Zoom Number Line



4.NF.C.6

# Technology Enhanced Question - Inline

Select a phrase from each drop-down menu to correctly complete each sentence.

The product of  $\frac{3}{5}$  and 4 is  4.

The product of  $1\frac{1}{2}$  and 2 is  2.

The product of  $\frac{5}{2}$  and  $\frac{13}{4}$  is   $\frac{13}{4}$ .

5.NF.B.5

# Technology Enhanced Question - Slider Question

Katie's house is **0.70** mile from her school. She passes the bakery on her way to school. The bakery is **0.28** mile from the school.

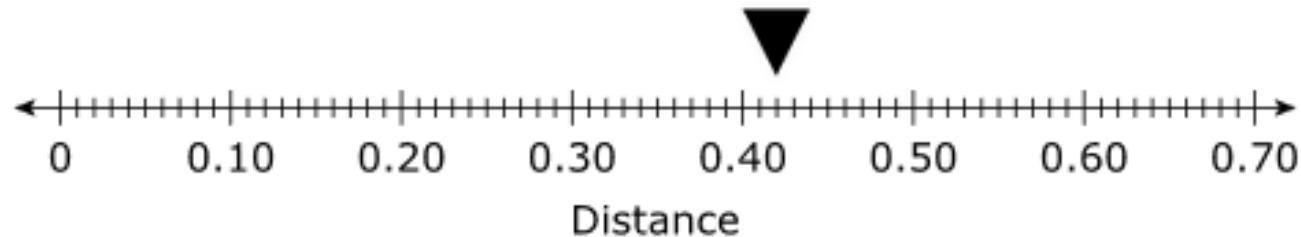
What is the distance, in miles, between the bakery and Katie's house?

Adjust the slider by dragging the arrow to the correct number on the number line to show the distance the bakery is from Katie's house.

Katie's  
house



School



4.MD.A.2

# Technology Enhanced Question – Hot Spot

Select the **two** expressions that have a product greater than  $\frac{2}{5}$ .

$\frac{2}{5} \times \frac{3}{2}$

$\frac{2}{5} \times \frac{1}{3}$

$\frac{2}{5} \times \frac{3}{4}$

$\frac{2}{5} \times \frac{6}{6}$

$\frac{2}{5} \times \frac{4}{1}$

5.NF.B.5

# Technology Enhanced Question – Line Plot

This list shows the shoe sizes of eight students in a fifth-grade class.

**Student's Shoe Sizes**

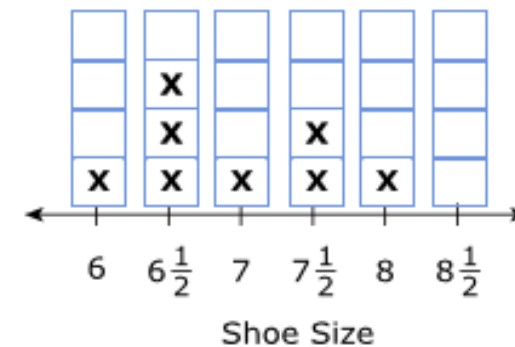
Name	Shoe Size
Becca	7
Cara	$6\frac{1}{2}$
Dean	$6\frac{1}{2}$
Kareem	$7\frac{1}{2}$
Leah	6
Luke	8
Suzanne	$6\frac{1}{2}$
Wally	$7\frac{1}{2}$

Complete the line plot to show the shoe sizes of the eight students in the fifth-grade class

Drag and drop the X into a box above the number line as many times as needed.



**Student's Shoe Sizes**



5.MD.B.2



# Technology Enhanced Question – Bar Graph

A teacher asked a group of students to record the color of their backpack. The total numbers for each color are shown in this table.

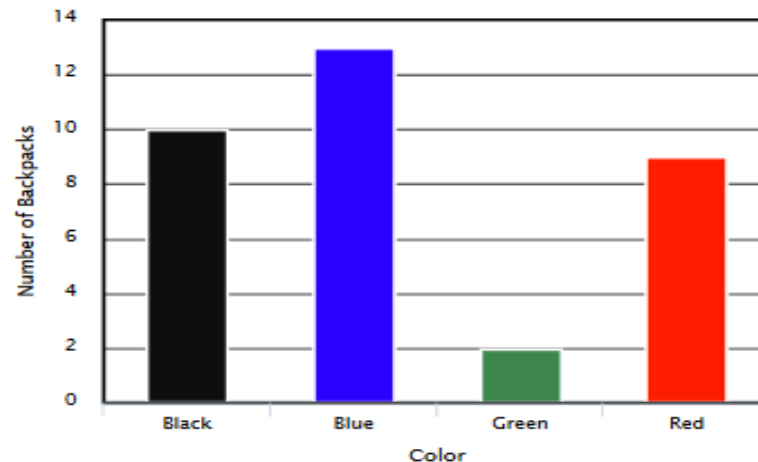
**Backpack Colors**

Color	Number of Backpacks
Black	10
Blue	13
Green	2
Red	9

Complete the bar graph to show the total number for each color in the teacher's table.

Drag the top of each bar to the correct height.

**Backpack Colors**



# Technology Enhanced Question – Picture Graph

This table shows the number of shells collected by four students at the beach last summer.

**Shells Collected**





Student	Number of Shells
Mary	12
Tim	16
Ethan	8
Kristen	4

Complete the picture graph to show the number of shells collected by each student at the beach last summer. Be sure to use the key.


Drag and drop the picture of the shell onto the graph next to each student's name as many times as needed.



**Shells Collected**

Student	Number of Shells
Mary	
Tim	
Ethan	
Kristen	

**Key**

Each  represents 4 shells.

3.MD.B.3

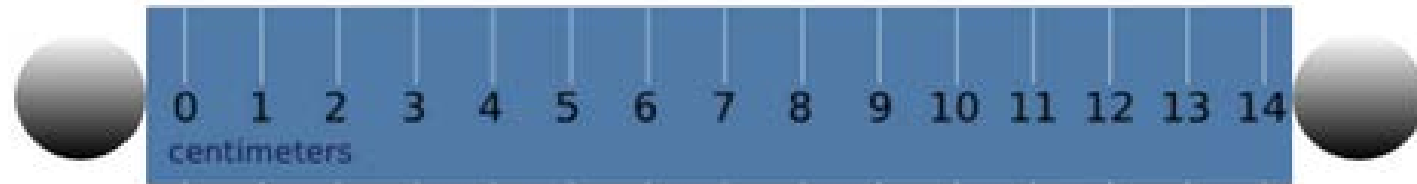


# Online Rulers

Eighth-inch Ruler



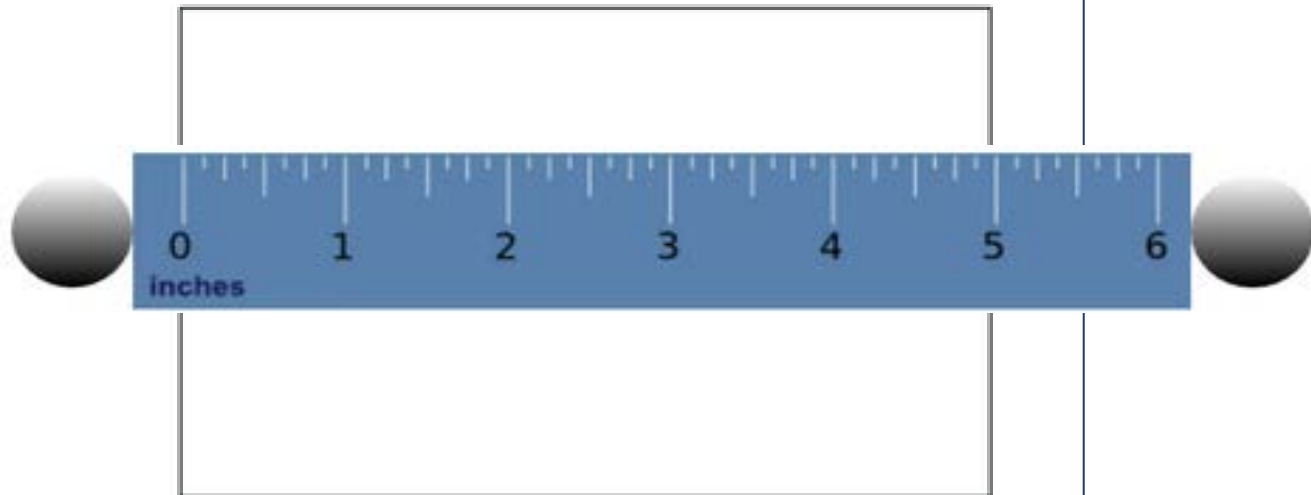
Centimeter Ruler



# Technology Enhanced Question – Using a Ruler

Use a ruler from the toolbar to answer this question.

A teacher drew a rectangle on the board, as shown.



What is the area, in square inches, of the rectangle the teacher drew?

Enter your answer in the box.

square inches

4.MD.B.3

# Technology Enhanced Question – Drag and Drop

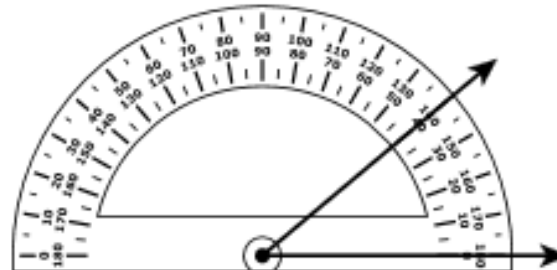
What is the measure of each angle?

Drag and drop an angle measure into each box.

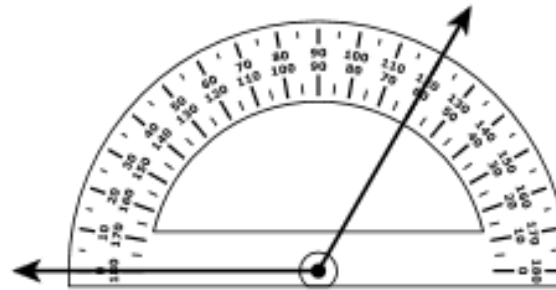
60°

90°

140°



40°



120°

4.MD.C.6

# 2-point Question - (Part A)

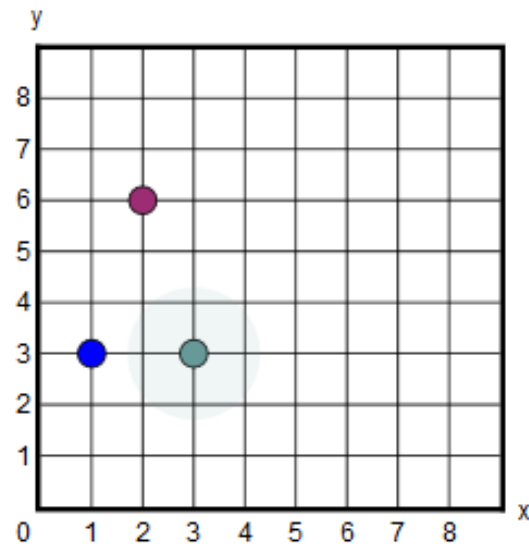
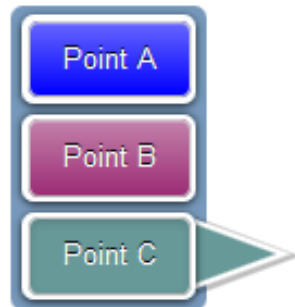
This question has two parts.

Mia is playing several rounds of a word game. Each coordinate pair shows the number of the round and Mia's score for that round. She is keeping track of these coordinate pairs on a coordinate plane.

- Round 1: (1, 3)
- Round 2: (2, 6)
- Round 3: (3, 3)

## Part A

Graph Mia's scores for the first three rounds of play. Select the "Point A" button and plot round 1. Select the "Point B" button and plot round 2. Select the "Point C" button and plot round 3. Be sure to graph all **three** points.



## 2-point Question - (Part B)

### Part B

In round 4, Mia scores the same number of points as in rounds 2 and 3 combined.

What is the coordinate pair that represents Mia's score for round 4?

- A. (4, 5)
- B. (9, 4)
- C. (5, 4)
- D. (4, 9)

5.G.A.2

# Short-Answer/Fill-In-The-Blank (Paper-based)

How many lines of symmetry does this letter have?



Enter your answer in the answer boxes at the top of the answer grid **and** completely fill the matching circles.

4.G.A.3



# Answering a Short Answer Question

**Grades 3 - 5**

•	•	•	•	•	•
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Answer Boxes

Decimal Point Bubbles

Number Bubbles

# Examples of How to Complete an Answer Grid

0	.	4	3	2	
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

		.	2	5	
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

			4	3	8
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6	8	1	9		
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



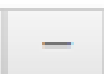












# Short-Answer/Fill-In-The-Blank (Computer-based)

There are 6 children on a bus. Each child is wearing a hat.

What fraction of the children on the bus are wearing a hat?

Enter your fraction in the space provided. Enter **only** your fraction.

$\frac{6}{6}$

3.NF.A.3

# Constructed Response Question (Part A)

**This question has two parts.**

Cindy is finding the quotient for  $27 \div 9$ . She says, "The answer is 18 because addition is the opposite of division and  $9 + 18 = 27$ ."

## Part A

Identify the incorrect reasoning in Cindy's statement.

Enter your explanation in the space provided.



▼ Math symbols

+	-	×	÷
$\frac{\square}{\square}$	$\square \square$	(-)	·
=	<	>	≠
\$	°	?	

# Constructed Response Question (Part B)

## Part B

Show or explain how Cindy can correct her reasoning.

Find the quotient when **27** is divided by **9**.

Enter your answer and your work or explanation in the space provided.



▼ Math symbols

+	-	×	÷
$\frac{\square}{\square}$	$\frac{\square}{\square}$	(-)	·
=	<	>	≠
\$	°	?	

3.OA.B.6

# Accommodations

- No new accommodations
- Supplemental reference sheets posted online
- Review the [Accessibility and Accommodations Manual](#)

# Universal Accessibility Features for All Students

Computer	Paper
Alternative background/font color ( <i>PNP</i> )	Colored overlays
Screen magnification/ Zoom tool	Magnification device
Line reader tool	Tracking device/straight edge
Answer Eliminator	Use pencil to eliminate answer choices
Answer Masking ( <i>PNP</i> )	Masking using blank card
Item flag/bookmark	Place marker
Highlighter	
Audio aids	
Human read-aloud (or sign) <u>selected words</u> on Math or STE, as requested by student	
Test administrator repeats/clarifies test directions	
Test administrator redirects student's attention to test	

# Resources

- MCAS Practice Tests: <http://mcas.pearsonsupport.com/student/>
- MCAS Tutorial: <http://mcas.pearsonsupport.com/student/>
- 2017 student samples: <http://www.doe.mass.edu/mcas/student/2017/>
- Test Designs:
  - Math: <http://www.doe.mass.edu/mcas/tdd/math.html?section=testdesign>
- Biweekly SAS update
  - Email [imailsrv@list1.doe.mass.edu](mailto:imailsrv@list1.doe.mass.edu)
  - "subscribe SASUpdate Your\_Name" (Example: subscribe SASUpdate John\_Smith)





# Questions / Thank You

## The Office of Student Assessment Services

---

 781.338.3625

 [mcas@doe.mass.edu](mailto:mcas@doe.mass.edu)

 [www.doe.mass.edu](http://www.doe.mass.edu)

 75 Pleasant Street, Malden, MA 02148

