



Smarter Balanced Assessment Consortium:

Mathematics Practice Test Scoring Guide Grade 3

08/14/2019



About the Practice Test Scoring Guides

The Smarter Balanced Mathematics Practice Test Scoring Guides provide details about the items, student response types, correct responses, and related scoring considerations for the Smarter Balanced Practice Test items. The items selected for the Practice Test are designed to reflect

- a broad coverage of claims and targets that closely mirror the summative blueprint.
- a range of student response types.
- a breadth of difficulty levels across the items, ranging from easier to more difficult items.

It is important to note that all student response types are not fully represented on every practice test, but a distribution can be observed across all the practice tests. The items presented are reflective of refinements and adjustments to language based on pilot test results and expert recommendations from both content and accessibility perspectives.

Within this guide, each item is presented with the following information¹:

- Claim: statement derived from evidence about college and career readiness
- Domain: a broad content area that contains related targets and standards (i.e., Geometry)
- Target: statement that bridges the content standards and the assessment evidence that supports the claim
- Depth of Knowledge (DOK): measure of complexity considering the student's cognitive process in response to an item. There are four DOK levels, a 4 being the highest level.
- Common Core State Standards for Mathematical Content (CCSS-MC)
- Common Core State Standards for Mathematical Practice (CCSS-MP)
- Static presentation of the item: static presentation of item from test administration system
- Static presentation of student response field(s): static presentation of response field from test administration system
- Answer key or exemplar: expected student response or example response from score point value
- Rubric and applicable score points for each item: score point representations for student responses

The following items are representative of the kinds of items that students can expect to experience when taking the Computer Adaptive Test (CAT) portion of the summative assessment for grade 3. A separate document is available that provides a grade 3 sample performance task and scoring guide.

¹ Most of these terms (Claim, Domain, Target, DOK, etc.) are further defined in various other Smarter Balanced documents, as well as the Common Core State Standards for Mathematics. Refer to the *Content Specifications for the Summative Assessment of the Common Core State Standards for Mathematics* for more information.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#1	1	OA	D	2	3.OA.D.8	N/A

Megan baked 28 sugar cookies and 24 chocolate chip cookies.
Enter the total number of cookies Megan baked in all.

← → ↶ ↷ ✖

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Key: 52

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#2	1	NBT	E	1	3.NBT.A.2	N/A

What unknown number makes this equation true?

$$\square = 881 - 72$$

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 809

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#3	1	OA	A	1	3.OA.A.3	N/A

There are 5 rows of trading cards with 3 trading cards in each row.
How many trading cards are there?

← → ↶ ↷ ✖

1	2	3	
4	5	6	
7	8	9	
0	.	$\frac{\Box}{\Box}$	

Key: 15

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#4	3	OA	F	2	3.OA.B	2, 4

Which expression is equal to 6×3 , and why?

- Ⓐ $6 + 3$, because the numbers are in the same order
- Ⓑ $6 \div 3$, because division and multiplication are inverse operations
- Ⓒ $3 + 6$, because the order of the numbers does not matter in addition
- Ⓓ 3×6 , because the order of the numbers does not matter in multiplication

Key: D

Rubric: (1 point) The student identifies the correct expression and reason.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#5	1	OA	A	1	3.OA.A.3	N/A

Jack has 24 fish. He puts them into 4 bowls. Each bowl has an equal number of fish.

How many fish are in each bowl?

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Key: 6

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#6	1	MD	G	1	3.MD.A.1	N/A

Look at the time on this clock.



Select the time, to the nearest minute, shown on the clock.

- Ⓐ 7:42
- Ⓑ 8:33
- Ⓒ 9:33
- Ⓓ 6:42

Key: D

Rubric: (1 point) The student selects the correct time.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#7	2	NBT	C	2	3.NBT.A.2	1, 2

The table shows the number of books in four third-grade classrooms. One of the teachers is Tim's teacher, and one of the teachers is Sue's teacher.

Teacher	Number of Books
Mr. Smith	136
Ms. Rose	148
Mr. Brown	172
Mrs. Lee	122

Tim's teacher has 26 more books than Sue's teacher.

Who is Tim's teacher?

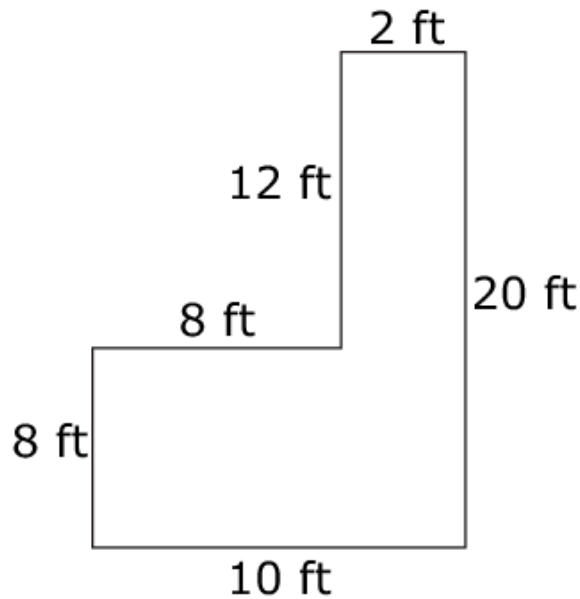
- Ⓐ Mr. Smith
- Ⓑ Ms. Rose
- Ⓒ Mr. Brown
- Ⓓ Mrs. Lee

Key: B

Rubric: (1 point) The student selects the correct teacher.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#8	1	MD	J	1	3.MD.D.8	N/A

The side lengths of a shape are shown.



Enter the perimeter, in feet, of the shape.

←
→
↶
↷
✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Key: 60

Rubric: (1 point) The student enters the correct perimeter of the shape.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#9	1	NF	F	1	3.NF.A.3	N/A

What number goes in the box to make the equation true?

$$\frac{\square}{1} = 5$$

← → ↶ ↷ ✖

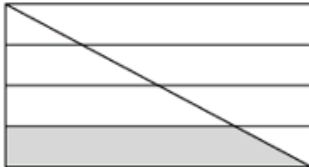
1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 5 or equivalent

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#10	3	NF	D	2	3.NF.A.1	3

Jamie drew this shape.



She says, "I divided the shape into 8 parts. I shaded 1 part. So $\frac{1}{8}$ of the shape is shaded."

Is Jamie correct? Select the statement that explains why.

- ☐ A Yes, because there is 1 large piece shaded.
- ☐ B Yes, because the shape is divided into 8 parts.
- ☐ C No, because the 8 parts should be the same size.
- ☐ D No, because there should be 1 medium piece shaded.

Key: C

Rubric: (1 point) The student selects the correct statement.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#11	1	OA	A	1	3.OA.A.4	N/A

What unknown number makes this equation true?

$$6 \times 8 = \square$$

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 48

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#12	1	OA	B	1	3.OA.B.6	N/A

Which equation has the same unknown value as $30 \div \square = 6$?

☐ A $6 \times 30 = \square$

☐ B $6 \div 30 = \square$

☐ C $6 \times \square = 30$

☐ D $6 \div \square = 30$

Key: C

Rubric: (1 point) The student selects the correct equation.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#13	1	OA	D	2	3.OA.D.9	N/A

Part of a multiplication table is shown.

What two numbers correctly complete the pattern in the table?

Enter your answers in the table.

12	15	18	21
16		24	28
20		30	35
24	30	36	42

Key: 20 in the first row and 25 in the second row

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#14	1	OA	C	1	3.OA.C.7	N/A

Decide whether each equation is true or false.

Click True or False for each equation.

	True	False
$8 \times 2 = 4 \times 6$	☐	☐
$7 \times 3 = 3 \times 7$	☐	☐
$5 \times 6 = 3 \times 10$	☐	☐

Exemplar: (shown at right)

Rubric: (1 point) The student correctly identifies the true equations.

	True	False
$8 \times 2 = 4 \times 6$	☐	☒
$7 \times 3 = 3 \times 7$	☒	☐
$5 \times 6 = 3 \times 10$	☒	☐

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#15	1	OA	C	1	3.OA.C.7	N/A

Enter the unknown numbers that make each equation true.

Enter the first unknown number in the first box.

Enter the second unknown number in the second box.

$$5 \times 8 = \square$$

$$8 \times 7 = \square$$

← → ↶ ↷ ✖

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 40 and 56

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

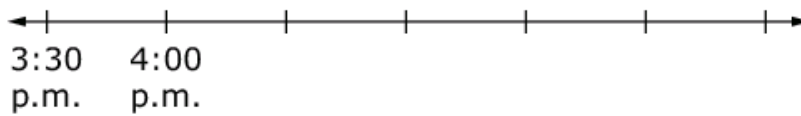
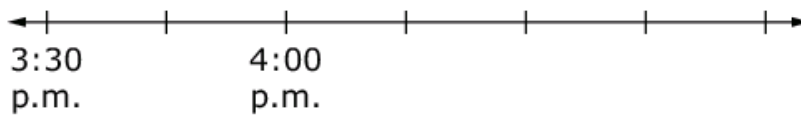
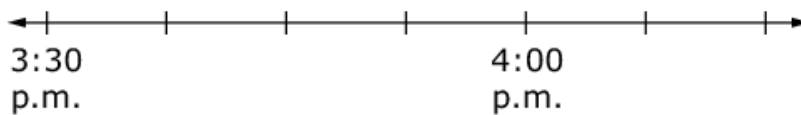
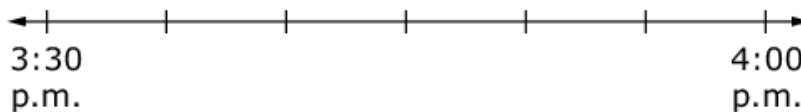
Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#16	3	MD	F	2	3.MD.A.1	4

Paul made a number line to show the times he started reading and finished reading.



Paul read for 45 minutes.

Which number line shows 4:00 p.m. in the correct place on Paul's number line?

- (A) 
- (B) 
- (C) 
- (D) 

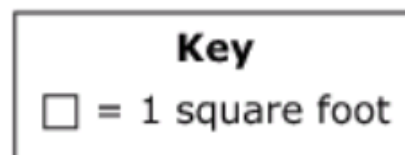
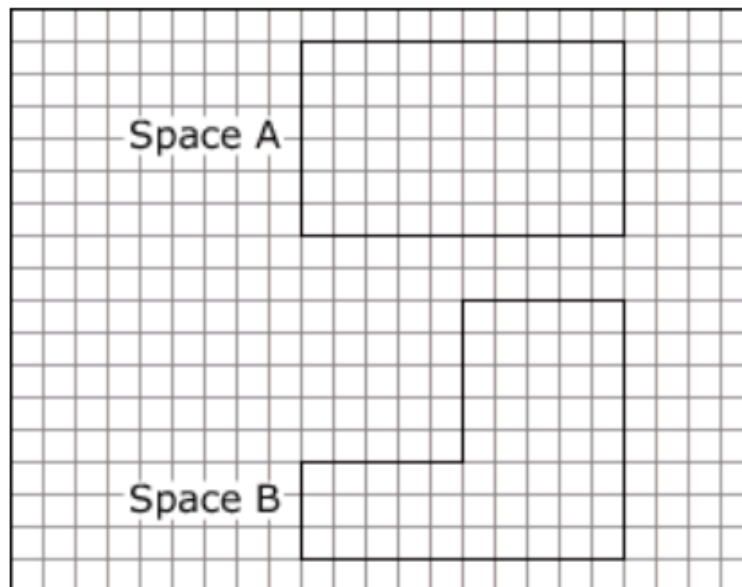
Key: B

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#17	1	MD	I	2	3.MD.C	4, 6

City planners want to build a garden by the city library.

- There are 2 possible spaces for the garden.
- The planners draw models of the spaces on a grid.
- Each unit length on a model equals a length of 1 foot.



How much more area does space A have than space B?

- Ⓐ 5 square feet
- Ⓑ 25 square feet
- Ⓒ 30 square feet
- Ⓓ 60 square feet

Key: A

Rubric: (1 point) The student selects the correct number of square feet.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#18	2	OA	A	2	3.OA.D.8	1

There are 9 cherry trees.

- Kim picks 8 cherries from each tree.
- Kim eats 14 of the cherries she picked.

Enter the number of cherries Kim has left.

←
→
↶
↷
✖

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 58

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#19	3	OA	E	2	3.OA.B.5	7

Libby said the answer to the problem $5 \times 2 \times 3$ is 25. Her work is shown.

- Step 1: $5 \times 2 = 10$
- Step 2: $5 \times 3 = 15$
- Step 3: $10 + 15 = 25$

Which is true?

- (A) Libby's answer is correct because $10 + 15 = 25$.
- (B) Libby's answer is correct because $2 + 3 = 5$ and $5 \times 5 = 25$.
- (C) Libby's answer is not correct because she multiplied 5×3 and 5×2 .
- (D) Libby's answer is not correct because she should have multiplied 10×15 .

Key: C

Rubric: (1 point) The student identifies the correct statement.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#20	4	OA	C	2	3.OA.D.8	1

Jamal's mother plans a trip for the baseball team.

- There are 14 players on the team.
- There are 5 parents going on the trip.
- The players and parents will all travel together in cars.
- Each car can hold a total of 5 people.
- There must be at least 1 parent in each car.

What is the **fewest** number of cars they will need?

←
→
↶
↷
✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Key: 4

Rubric: (1 point) The student enters the fewest number of cars needed.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#21	3	NF	D	2	3.NF.A.3	2

Drag one number inside each box to make each statement true.

2
3
4
6
8

= 1

< 1

> 1

Key: For the first fraction equal to 1: 2/2, 3/3, 4/4, 6/6, or 8/8

For the second fraction less than 1: 2/3, 2/4, 2/6, 2/8, 3/4, 3/6, 3/8, 4/6, 4/8, or 6/8

For the third fraction greater than 1: 3/2, 4/2, 6/2, 8/2, 4/3, 6/3, 8/3, 6/4, 8/4, or 8/6

Rubric: (2 points) The student completes all three comparisons correctly.

(1 point) The student completes only two comparisons correctly.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#22	2	OA	C	2	3.OA.A, 2.OA.C	6

Jan divides 36 pens into groups.

- Each group has the same number of pens.
- Jan uses all of the pens.

For each number of pens in a group, click **Yes** or **No** to show if Jan can create groups that each have that number of pens.

	Yes	No
2 pens in each group	☐	☐
3 pens in each group	☐	☐
5 pens in each group	☐	☐
6 pens in each group	☐	☐
10 pens in each group	☐	☐

Exemplar: (shown at right)

Rubric: (1 point) The student correctly identifies which groups can be formed using all the pens.

	Yes	No
2 pens in each group	☒	☐
3 pens in each group	☒	☐
5 pens in each group	☐	☒
6 pens in each group	☒	☐
10 pens in each group	☐	☒

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#23	4	MD	D	3	3.MD.B.3	5

Jenna made a picture graph in which each star represents some number of students. She forgot to complete the key.

Favorite Color

Color	Number of Votes
Red	★ ★
Blue	★ ★ ★ ★
Yellow	★ ★ ★ ★
Green	★ ★ ★ ★

Key

★ represents

The difference between the number of students who voted for blue and the number of students who voted for red is greater than 5 but less than 9.

Enter a possible number of students that each star could represent.

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\Box}{\Box}$

Key: 3 or 4

Rubric: (1 point) The student enters a possible number of students each star could represent.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#24	1	MD	H	2	3.MD.B.4	4

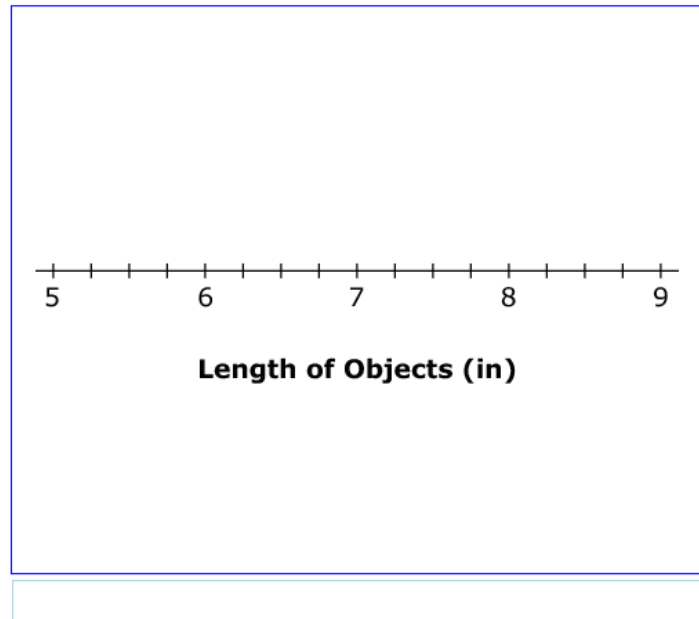
76545



Students pulled classroom objects from a bag and measured them in inches. They used this data to make a line plot.

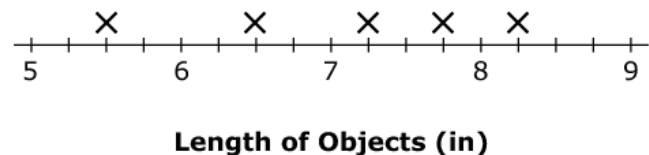
Objects	Length (in)
Pen	$5\frac{1}{2}$
Scissors	$7\frac{3}{4}$
Stapler	$7\frac{1}{4}$
Calculator	$6\frac{1}{2}$
Notepad	$8\frac{1}{4}$

Click above the tick marks to complete the line plot that displays the data.



Exemplar: (shown at right)

Rubric: (1 point) The student correctly completes the line plot.



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#25	4	OA	E	2	3.OA.D.8	7

Kaden has 7 bags of animal toys. Each bag has these animal toys in it.

- 1 whale toy
- 5 dolphin toys
- 2 turtle toys

How many animal toys does Kaden have altogether?

Select **all** of the equations that show how to find the total number, t , of animal toys.

- ☐ $7 \times 8 = t$
- ☐ $7 + 1 + 5 + 2 = t$
- ☐ $7 \times (1 + 5 + 2) = t$
- ☐ $7 + (1 \times 5 \times 2) = t$

Key: first and third equations

Rubric: (1 point) The student identifies the correct equations.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#26	3	NF	B	3	3.NF.A.3	6

Two comparisons are shown.

$$\frac{\square}{\square} < \frac{2}{3}$$

$$\frac{\square}{\square} > \frac{2}{6}$$

Enter one fraction that makes both comparisons true.

← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: Any fraction between $\frac{2}{6}$ and $\frac{2}{3}$; for example, $\frac{2}{4}$, $\frac{3}{5}$, $\frac{4}{10}$, etc. Decimal equivalents for the fractions are also acceptable.

Rubric: (1 point) The student enters an acceptable fraction or decimal.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#27	1	OA	D	2	3.OA.D.8	N/A

Jana has 107 wooden beads and 68 glass beads. How many more wooden beads than glass beads does Jana have?

Enter your answer in the response box.

←
→
↶
↷
✖

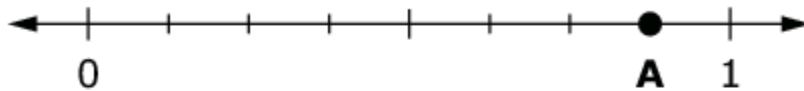
1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 39

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

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#28	1	NF	F	2	3.NF.A.2	4

Enter the fraction located at Point A on the number line.



← → ↶ ↷ ✕

1	2	3
4	5	6
7	8	9
0	.	$\frac{\square}{\square}$

Key: 7/8 or equivalent

Rubric: (1 point) The student enters a correct fraction represented by Point A.

Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#29	3	NF	A	2	3.NF.A.3	3

Nicki is comparing fractions.

She states, " $\frac{2}{3}$ is greater than $\frac{2}{4}$ because each $\frac{1}{3}$ piece is larger than each $\frac{1}{4}$ piece."

Part A

Click on the fraction bars to show $\frac{2}{3}$ and $\frac{2}{4}$.

Part B

Is Nicki correct? Click Yes or No.

Drag the correct symbol to compare the fractions.

Delete

Part A:

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{4}$

$\frac{1}{4}$

$\frac{1}{4}$

$\frac{1}{4}$

Part B:

Yes

No

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

Exemplar: (shown at right)

Rubric: (2 points) The student clicks on the correct number of $\frac{1}{3}$ and $\frac{1}{4}$ pieces in Part A and clicks on "Yes" and drags ">" into the box in Part B.

(1 point) The student correctly completes either Part A or Part B, but not both.

Part A:

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{4}$

$\frac{1}{4}$

$\frac{1}{4}$

$\frac{1}{4}$

Part B:

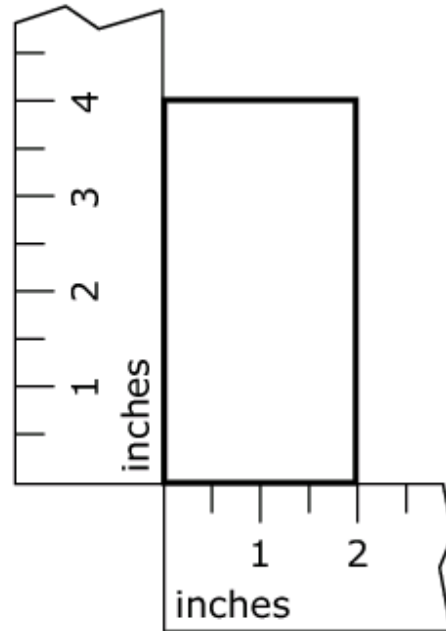
Yes

No

$\frac{2}{3}$ > $\frac{2}{4}$

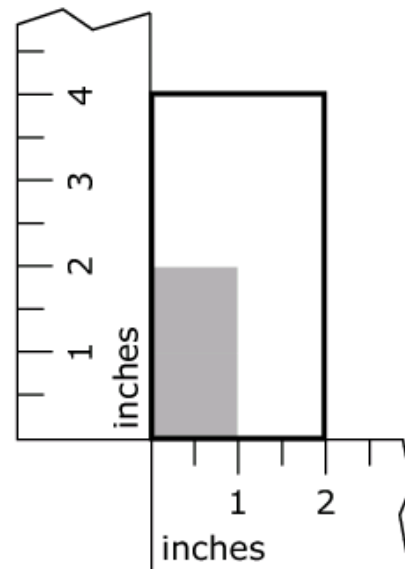
Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#30	1	G	K	2	3.G.A.2	4

This rectangle can be divided into equal parts. Click to shade $\frac{1}{4}$ of the rectangle.



Exemplar: (one possible solution shown at right)

Rubric: (1 point) The student correctly shades $\frac{1}{4}$ of the rectangle.



Item	Claim	Domain	Target	DOK	CCSS-MC	CCSS-MP
#31	1	OA	B	1	3.OA.B.5	7

Decide whether each expression is equal to 4×12 .
Select Yes or No for each expression.

	Yes	No
$4 \times (10 + 2)$	☐	☐
$(4 \times 10) + 2$	☐	☐
$4 + (10 \times 2)$	☐	☐

Exemplar: (shown at right)

Rubric: (1 point) The student correctly identifies the equal expressions.

	Yes	No
$4 \times (10 + 2)$	☒	☐
$(4 \times 10) + 2$	☐	☒
$4 + (10 \times 2)$	☐	☒

Smarter Balanced Assessment Consortium:

Going Green Performance Task
Grade 3 Mathematics Practice Test
Scoring Guide
08/14/2019



Going Green

The “Go Green” company held a week-long recycling contest at your school. The grade that collects the most bottles and cans wins the contest.

Your task is to determine which grade won the “Go Green” contest.

The items that can be recycled are shown.



- Plastic bottles
- Aluminum cans
- Glass bottles

Students from the 3rd grade, 4th grade, and 5th grade classes collected bottles and cans and brought them to school.

Table 1 shows how many bottles and cans each grade collected on each day of the week.

Table 1. Bottles and Cans Collected

Class	Bottles and Cans Collected Each Day				
	Monday	Tuesday	Wednesday	Thursday	Friday
3rd Grade	50	60	90	120	90
4th Grade	70	90	100	50	80
5th Grade	80	80	80	80	80

1

Use **Table 1** to help you answer this question.

On which days did the 3rd grade class collect more cans and bottles than the other two grades? Select **all** that apply.

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday

2

Use **Table 1** to help you answer this question.

On Tuesday, how many more bottles and cans did the 4th grade class collect than the 3rd grade class?

3

You are the contest judge. You need to figure out who won the contest. Did 3rd grade, 4th grade, or 5th grade win the “Go Green” contest?

Use words and numbers to clearly explain:

- which grade won the contest, and
- how you know they collected the most cans and bottles.

4

The 2nd grade class got excited about the “Go Green” contest and wanted to join in. They started collecting bottles and cans on Wednesday, even though they missed the first two days.

Complete the table to show a way for the 2nd grade class to still win the contest.

	Wednesday	Thursday	Friday
2nd Grade			

5

Use your answers from questions 3 and 4 to explain how the 2nd grade class could have won the “Go Green” contest.

1

Use **Table 1** to help you answer this question.

On which days did the 3rd grade class collect more cans and bottles than the other two grades? Select **all** that apply.

- ☐ Monday
- ☐ Tuesday
- ☐ Wednesday
- ☐ Thursday
- ☐ Friday

#1 Multiple select – 1 point

Item	Claim	Domain	Target	DOK	Content	MP	Key(s)	Points
#1	2	NBT	2D	1	1.NBT.B.3	1	D and E	1

Rubric (1 point): The student selects both Thursday and Friday.

2

Use **Table 1** to help you answer this question.

On Tuesday, how many more bottles and cans did the 4th grade class collect than the 3rd grade class?

#2 Equation numeric – 1 point

Item	Claim	Domain	Target	DOK	Content	MP	Key(s)	Points
#2	2	NBT	2D	1	1.NBT.B.3	1	30	1

Rubric (1 point): The student enters 30.

Commentary: The purpose of these first two questions is primarily to assess whether the student (1) understands the context and the representation (a table) and (2) can identify and infer relevant quantities and perform typical calculations (compare magnitudes).

The context is reasonably authentic. Many schools have recycling contests to encourage students to bring in bottles and cans to recycle. Keeping track of how many each class brings in each day is a good experience for students to record and represent quantities. This task is about deciding which class wins the school recycling contest.

Rationale for Content:

The content is securely held, being essentially Grade 1:

1.NBT.B.3 Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

Since these questions are intended to be accessible for most students, the numbers have been kept simple so as not to create arithmetic computational obstacles in obtaining evidence of Claims 2, 3, or 4.

Rationale for Claim:

The fact that the student must extract the quantities, choose the procedure, and calculate the answer from a well-posed problem is what makes both questions 1 and 2 align to Target 2D.

Claim 2, Target D: Identify important quantities in a practical situation and map their relationships (e.g., using diagrams, two-way tables, graphs, flowcharts, or formulas).

Rationale for DOK:

Both items are straightforward DOK 1: From the *Cognitive Rigor Matrix/Depth of Knowledge* chart:

-Retrieve information from a table or graph to answer a question.

3

You are the contest judge. You need to figure out who won the contest. Did 3rd grade, 4th grade, or 5th grade win the “Go Green” contest?

Use words and numbers to clearly explain:

- which grade won the contest, and
- how you know they collected the most cans and bottles.

#3 Short answer – 2 points

Item	Claim	Domain	Target	DOK	Content	MP	Key(s)	Points
#3	3	NBT	3F	3	2.NBT.B	3	See rubric	2

Rubric:

2 points: The student develops an approach (add the totals and compares) to determine the winner AND gives a justification for the result.

1 point: The student correctly states that 3rd grade won but without an explanation as to why OR gives correct calculations but with a logically flawed justification.

0 points: All other responses

Commentary: This question is designed to provide 3rd-grade students an opportunity to develop and justify a result. It is reasonably authentic and addresses the overarching question, which is “who won the contest?” The key elements are that students are not told what quantities to use, how they are operated on, nor what to conclude from them. This increases the depth of knowledge. This question is not meant to be overly difficult in terms of numeric computational complexity, lest it distract students from the communicating reasoning aspect of the question.

Rationale for Content:

The content is securely held, Grade 2 NBT:

- 2.NBT.B Use place value understanding and properties of operations to add and subtract.
- 5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
- 6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Again, the numbers are designed to be easy to work with so as not to be an obstacle for students focusing on communicating reasoning.

Rationale for Claim:

The work required for this problem has a few necessary steps: (1) Students must develop a chain of reasoning, i.e., interpret the context (winning class collects the most for the week). This requires adding up the amounts collected by each class each day and then comparing the totals.

NOTE: By design, this problem does *not* tell the students to add up the totals and compare. This takes away the scaffolding and requires the student to select the quantities and appropriate operation to use on them, based on the context. (2) Students must provide an explanation to justify a claim. Correctly adding the amounts does not provide a logical argument. The student must connect the computation to the reasoning, essentially, that the 3rd grade total is greater than the totals for the 4th- and 5th-grade classes, hence they win the contest.

Claim 3, Target B: Tasks used to assess this target should ask students to develop a chain of reasoning to justify or refute a conjecture. Tasks for Target B might include the types of examples called for in Target A as part of this reasoning, but should do so with a lesser degree of scaffolding than tasks that assess Target A alone.

Rationale for DOK:

This question qualifies for DOK 3 for a few reasons. From the *Cognitive Rigor Matrix/Depth of Knowledge* chart:

ANALYZE (DOK3)

- Compare information within or across data sets or texts
- Analyze and draw conclusions from data, citing evidence

EVALUATE (DOK3)

- Cite evidence and develop a logical argument

It is crucial to note that scaffolding is not provided for the students. The students must do the analyzing and evaluating to support the conclusion of which class won the contest. Specifying the steps for the students would have reduced this problem to DOK 2 or DOK 1.

What follows are sample responses and scoring annotations for Item 3.

Sample Response 3a

B
I
U
 I_x

$\frac{1}{2}$
 $\frac{3}{4}$
 $\frac{1}{2}$
 $\frac{3}{4}$

ABC

Ω

3rd grade won because I added up each one and got the most for 3rd grade. 3rd grade had 410, 4th grade has 390, and 5th grade had 400.

5th grade is $80+80+80+80+80=400$ total

4th grade is $70+90+100+50+80=390$ total

3rd grade is $50+60+90+120+90=410$ total

SCORE POINT

2

The student correctly calculated the total number of bottles and cans collected by each grade, as well as explained why 3rd grade was the winner of the contest. The response contains evidence of the student's competence in reasoning to the full extent that these processes apply to this item.

Sample Response 3b

B I U I_x **1= :≡ ±≡ ±≡** **✂** **📄** **📋** **↶** **↷** **ABC** **Ω**

3rd grade won the "Go Green" contest. I know that because I added
 $120+90+90+60+50$ and got 410.
 4th grade got 290 botles and cans.
 5th grade got 400 bottles and cans.

SCORE POINT

2

The student *incorrectly* calculated the total number of bottles and cans collected by each grade (error in 4th grade), but *correctly* determined the winner based on those calculations and provided a logical explanation as to why 3rd grade won the contest. The response contains evidence of the student's competence in reasoning and while it contains a minor flaw, it does not detract from a demonstration of full understanding.

Sample Response 3c

B I U I_x **1= :≡ ±≡ ±≡** **✂** **📄** **📋** **↶** **↷** **ABC** **Ω**

3rd grade 410
 4th grade 390
 5th grade 400

- 3rd grade won the "Go Green" contest
- I know that 3rd grade won because I count how many bottles and cans they have each day.

SCORE POINT

1

The student correctly calculated the total number of bottles and cans collected by each grade, as well as correctly identified the winner of the contest. However, "because I count how many bottles and cans they have each day" is not the reason the 3rd grade class won the contest. The student was unable to make the logical connection and has demonstrated only a **partial** understanding of the mathematical content and practices essential to this item.

Sample Response 3d

3rd grade: $50 + 60 + 90 + 120 + 90 = 410$ bottles and cans
 4th grade: $70 + 90 + 100 + 50 + 80 = 390$ bottles and cans
 5th grade: $80 + 80 + 80 + 80 + 80 = 400$ bottles and cans
 3rd grade won the "Go Green" contest because they have 410 bottle and cans.

SCORE POINT

1

The student correctly calculated the total number of bottles and cans collected by each grade, as well as correctly identified the winner of the contest. However, the student did not make a logical connection between why 3rd grade won the contest (i.e., collected the most bottles and cans) and has therefore demonstrated only a **partial** understanding of the mathematical content and practices essential to this item.

Sample Response 3e

$50 + 60 + 90 + 120 + 90 = 410$ for 3rd grade.
 $70 + 90 + 100 + 50 + 80 = 390$ for 4th grade.
 $80 + 80 + 80 + 80 + 80 = 400$ for 5th grade.

SCORE POINT

0

Although the student correctly calculated the total number of bottles and cans collected by each grade, he/she did not identify the winner of the contest, nor justify why that grade won. No evidence is present that demonstrates the student's competence in reasoning or communicating essential to this item.

Sample Response 3f

B
I
U
~~I_x~~

$\sum$
 $\equiv$
 $\div$
 $\times$

✂
📄
📋
↶
↷
ABC
Ω

4th grad won becse they claked the mast botles

3rd 310 4th 400 5th 420

SCORE POINT

0

The student made two errors. First, he/she did not add the total number of bottles and cans correctly. Second, based on the incorrect calculations, he/she did not draw a correct conclusion. Based on the addition shown in the response, 5th grade should have won the contest but this student claimed that 4th grade won. No evidence is present that demonstrates the student's competence in reasoning essential to this item.

4

The 2nd grade class got excited about the "Go Green" contest and wanted to join in. They started collecting bottles and cans on Wednesday, even though they missed the first two days.

Complete the table to show a way for the 2nd grade class to still win the contest.

	Wednesday	Thursday	Friday
2nd Grade			

#4 Table item – 1 point

Item	Claim	Domain	Target	DOK	Content	MP	Key(s)	Points
#4	4	OA	4A	2	2.OA.A.1	2,4	See rubric	1

Rubric:

1 point: The student enters any numbers in the three days that add up to more than 410 (the total from 3rd grade for the week). NOTE: Do not grade on "reasonableness," i.e., answers like 1,000,000 are allowed.

0 points: All other responses

One example of a correct response:

	Wednesday	Thursday	Friday
2nd Grade	200	200	200

Commentary: The purpose of the question is to increase the level of abstraction for a 3rd-grade student to solve a reasonably authentic "extension" question, involving hypothetical 2nd-grade students wanting to join the contest late. The student must be able to reason that, even though they have less time, the 2nd-grade class could still win if they collect more than the 3rd-grade class. This question splits off the modeling from the explanation (see Question #3).

Rationale for Content:

The content is securely held; it moves on the progression from Grade 2 Operations and Algebraic Thinking.

2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.

Note that the numbers exceed the "within 100" description, but 3rd-grade students should, by the time of the PT, be comfortable with numbers with values of several hundred.

Rationale for Claim:

This question is different in that students are *not given specific numbers to work with*. This increases the abstraction. They need to interpret the context and invent numbers that will reasonably model a hypothetical scenario. In some sense, this is a *design under constraints* type of modeling question. That is what makes this a Claim 4: Apply mathematics to solve problems arising in everyday life, society, and the workplace.

Claim 4, Target A: Problems used to assess this target for Claim #4 should not be completely formulated (as they are for the same target in Claim #2), and require students to extract relevant information from within the problem and find missing information through research or the use of reasoned estimates.

Rationale for DOK:

This question is DOK 3 for the following reasons. From the *Cognitive Rigor Matrix/Depth of Knowledge* chart:

UNDERSTAND (DOK 3)

- Use concepts to solve non-routine problems

- Explain reasoning when more than one response is possible

CREATE (DOK 3)

- Develop an alternative solution

This is a non-routine problem, with many different possible answers. The fact that students must develop a solution to a problem by creating numbers that satisfy certain constraints pushes this past the threshold of DOK 2 and into DOK 3 territory.

5

Use your answers from questions 3 and 4 to explain how the 2nd grade class could have won the "Go Green" contest.

#5 Short answer – 2 points

Item	Claim	Domain	Target	DOK	Content	MP	Key(s)	Points
#5	3	OA	3A	3	2.OA.A	3	See rubric	2

Rubric:

2 points: The student takes the value from Question 4 and states that it is more than the winning number from Question 3 (e.g., 410). NOTE: For full credit the student cannot just give a number (e.g., 800) and state, "it is more." We are looking for a *logical statement that explicitly makes use of the information*.

1 point: The student states the information but does not fully make the logical connections.

0 points: All other responses

NOTE: We anticipate people will disagree with some of these samples. We want to highlight that we are not looking for just *evidence of understanding*, but we are looking for evidence of *communicating reasoning*. In piloting, many 3rd-grade students understood and correctly answered the question, but did not communicate or justify the result at a level we want as the expectation for Grade 3.

Commentary: This question is designed to provide an opportunity for students to create an explanation based on several pieces of information. Students cannot just make calculations or statements without justification.

Rationale for Content:

The content is securely held; it moves on the progression from Grade 2 Operations and Algebraic Thinking.

2.OA.A.1 Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions.

Note that the numbers exceed the "within 100" description, but 3rd-grade students should, by the time of the PT, be comfortable with numbers with values of several hundred.

Rationale for Claim:

This question addresses Claim 3. Students must put together several pieces of information to support a claim.

Claim 3, Target A: Tasks used to assess this target should ask students to develop a chain of reasoning to justify or refute a conjecture.

Rationale for DOK:

This question is DOK 3 for the following reasons. From the *Cognitive Rigor Matrix/Depth of Knowledge* chart:

UNDERSTAND (DOK 3)

-Use concepts to solve non-routine problems

-Explain reasoning when more than one response is possible

This is a non-routine problem, with many different possible answers. The key aspect of the argument must be that the numbers proposed for 2nd graders in Question #4 must be explicitly compared to the totals in Question #3, and the logical connection is that that the amount is more, and whoever collects the most wins the contest.

What follows are sample responses and scoring annotations for Item 5.

Sample Response 5a

2nd grade could have won the contest if they collected 260 bottle and cans on Wednesday, 100 on Thursday, 300 on Friday. If you add it up it will beat 3rd grade.

$$\begin{array}{r} 300 \\ 260 \\ + 100 \\ \hline 660 \end{array}$$

Bottles and cans

SCORE POINT

2

The student selected values for bottles and cans collected that exceeded 410 (more than 3rd grade), and he/she explained why a total of 660 bottles and cans would result in the 2nd grade class winning the contest. The student has demonstrated a **full and complete** understanding of all mathematical content and practices essential to this item.

Sample Response 5b

2nd grade could have won the contest if they collected 120 on Wednesday and 200 on Thursday and 100 on Friday and that would bet 3rd grade had 410 and if you add 120, 200, 100, it would be 420 and 420 is greater than 410.

SCORE POINT

2

The student selected values for bottles and cans collected that exceeded 410 (more than 3rd grade), and he/she explained why a total of 420 bottles and cans would result in the 2nd grade class winning the contest. The student has demonstrated a **full and complete** understanding of all mathematical content and practices essential to this item.

Sample Response 5c

Well, I put 500 because 3rd grade had 410. So if I put 500 then thy will have more.

SCORE POINT

1

The student selected values for bottles and cans collected that exceeded 410 (more than 3rd grade), but he/she did not explain why it is important for 500 to be more than 410. The student's response contains some of the attributes of an appropriate response but lacks convincing evidence that the student fully comprehends the essential mathematical ideas addressed by this task.

Sample Response 5d

2nd could have won the contest if they collected 200 cans
Wednesday - Friday.

136	200
136	200
<u>136</u>	<u>200</u>
408	600 is greater than 410
+ 2	
<u>410</u>	

SCORE POINT

1

The student selected values for bottles and cans collected that exceeded 410 (more than 3rd grade), but he/she did not explain why it is important for 600 to be more than 410. The student's response contains some of the attributes of an appropriate response but lacks convincing evidence that the student fully comprehends the essential mathematical ideas addressed by this task.

Sample Response 5e

B I U T_x **¶** **☰** **☷** **✂** **📄** **📋** **↶** **↷** **ABC** **Ω**

Well they won because in number 3 there says that they have to win the contest because they wanted to participate in the "Go Green" so I got from that answer 800.

SCORE POINT**0**

Although the student selected values for bottles and cans collected that exceeded 410 (more than 3rd grade), he/she did not explain why the value of 800 bottles and cans would be a way for 2nd grade to win the contest. There are significant omissions or irregularities that indicate a lack of comprehension in regard to the mathematical content and practices essential to this task.

The handscored items in this guide are both 2-point short-text items. The general rubric that is used as a basis for scoring all 2-point short-text items is shown below. Although item-specific rubrics are also provided to scorers to facilitate the handscoring of short-text items, every response should be able to map back to this general rubric in a consistent and reliable manner.

Smarter Balanced Mathematics General Rubric for 2-Point Items

Score	Description
2	The student has demonstrated a full and complete understanding of all mathematical content and practices essential to this task. The student has addressed the task in a mathematically sound manner. The response contains evidence of the student's competence in problem solving, reasoning, and/or modeling to the full extent that these processes apply to the specified task. The response may, however, contain minor flaws that do not detract from a demonstration of full understanding.
1	The student has demonstrated a partial understanding of the mathematical content and practices essential to this task. The student's response contains some of the attributes of an appropriate response but lacks convincing evidence that the student fully comprehends the essential mathematical ideas addressed by this task. Such deficits include evidence of insufficient mathematical knowledge; errors in fundamental mathematical procedures; and other omissions or irregularities that bring into question the student's competence in problem solving, reasoning, and/or modeling related to the specified task.
0	The student has demonstrated merely an acquaintance with the topic, or provided a completely incorrect or uninterpretable response. The student's response may be associated with the task, but contains few attributes of an appropriate response. There are significant omissions or irregularities that indicate a lack of comprehension in regard to the mathematical content and practices essential to this task. No evidence is present that demonstrates the student's competence in problem solving, reasoning, and/or modeling related to the specified task.