New England Common Assessment Program

Released Items
2009

Grade 4
Mathematics

Mathematics

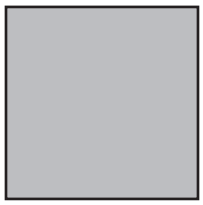
Items with this symbol were selected from Session One—no calculators or other mathematics tools allowed.

1 A number has 24 ones, 3 hundreds, and 15 tens.

What is the number?

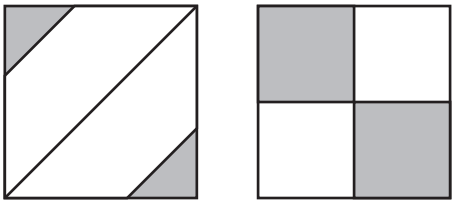
- ○ A. 384
- ○ B. 474
- ○ C. 24,315
- ○ D. 31,524

2 This model represents 1.

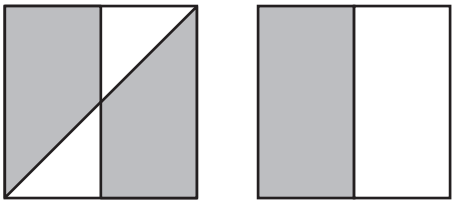


Which two models represent equivalent fractions?

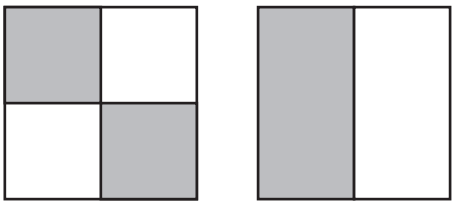
○ A.



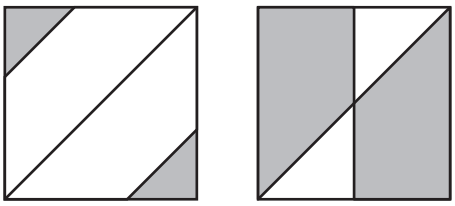
○ B.



○ C.



○ D.



❸ Look at this problem.

> Jessica gave Katie 3 sets of stamps. Each set has 6 stamps. What is the total number of stamps Jessica gave Katie?

In which pair can **both** number sentences be used to solve this problem?

○ A.
$3 + 6 = \square$
$6 + 6 + 6 = \square$

○ B.
$3 + 6 = \square$
$6 \times 6 \times 6 = \square$

○ C.
$3 \times 6 = \square$
$3 + 6 = \square$

○ D.
$3 \times 6 = \square$
$6 + 6 + 6 = \square$

❹ Lela bought these items at a yard sale.

Lela went to the sale with a five-dollar bill. How much money does Lela have left?

○ A. $3.40
○ B. $2.60
○ C. $2.40
○ D. $1.60

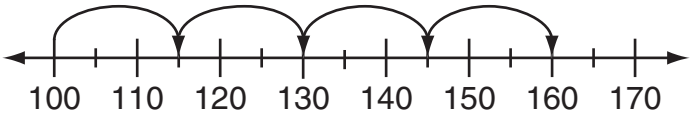
5 Emmet put an "S" on this calendar to show the day of his first soccer game in August.

August						
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
			1	2	3	S 4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Emmet's second soccer game is exactly three weeks later. What is the date of his second soccer game?

- A. August 7
- B. August 18
- C. August 24
- D. August 25

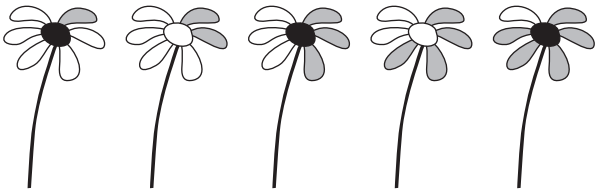
6 Malcolm drew arrows on this number line to make a number pattern.



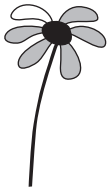
What is the next number an arrow should point to on the number line?

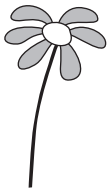
- A. 165
- B. 170
- C. 175
- D. 180

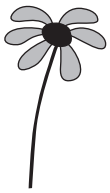
7 Look at this pattern.

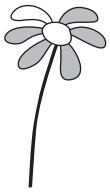


What flower comes next in the pattern?

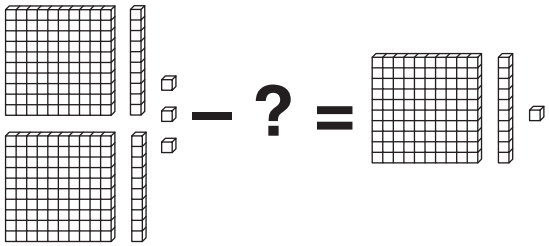
○ A. 

○ B. 

○ C. 

○ D. 

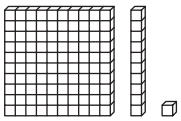
8 Look at the number sentence shown by these blocks.

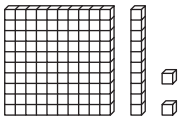


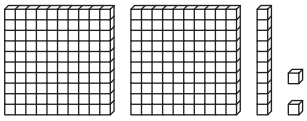
Key

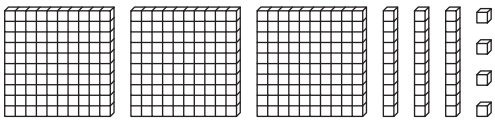
represents 1

Which set of blocks makes the number sentence true?

○ A. 

○ B. 

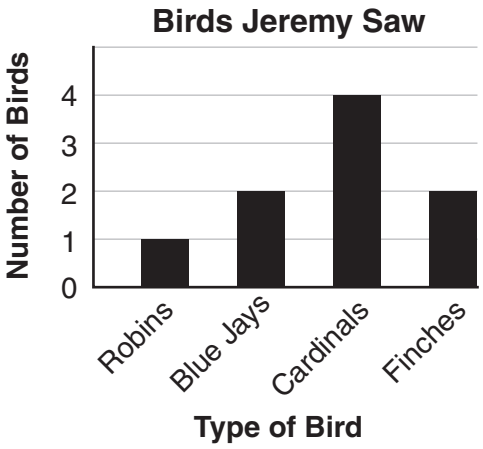
○ C. 

○ D. 

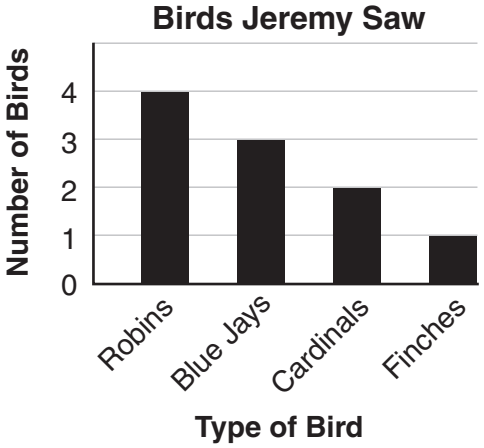
9 Jeremy saw some birds during a nature hike. The type of bird he saw **most** often was a robin. The type of bird he saw **least** often was a cardinal. Which bar graph could show the number of birds that Jeremy saw?

○ A.

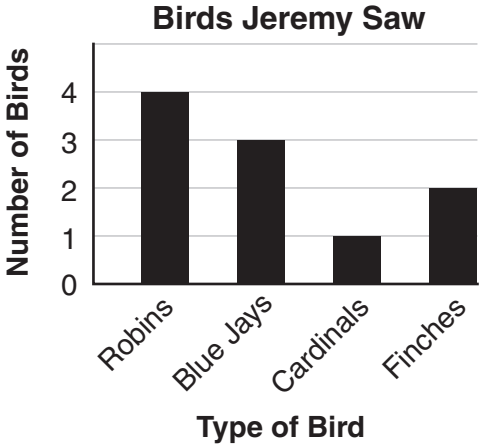
○ B.



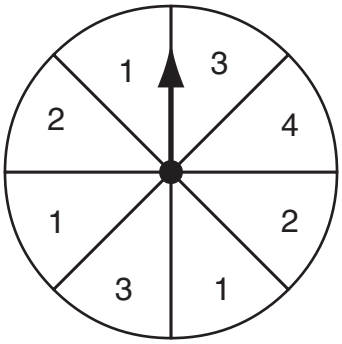
○ C.



○ D.



10 Look at this spinner.



On what number is the arrow **least** likely to land?

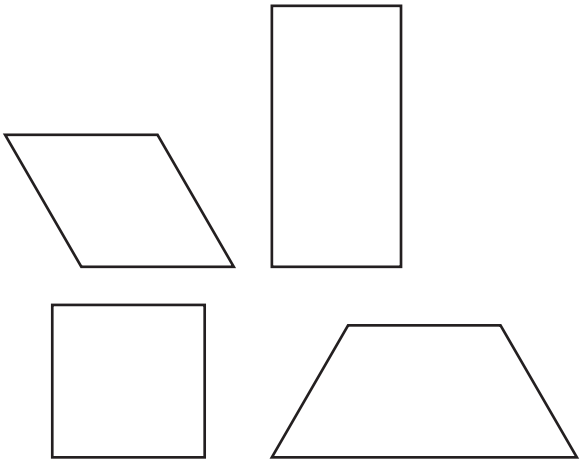
- A. 1
- B. 2
- C. 3
- D. 4

11 Marco solved this multiplication problem.

$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

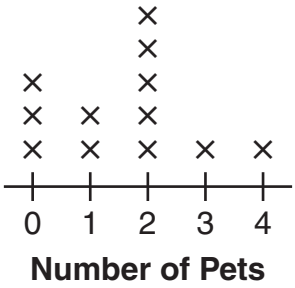
Write a number sentence using addition that Marco could use to check his work.

12 Look at these shapes.



Put an X on each shape that is a rectangle.

13 Eric made this line plot to show how many pets his friends have.

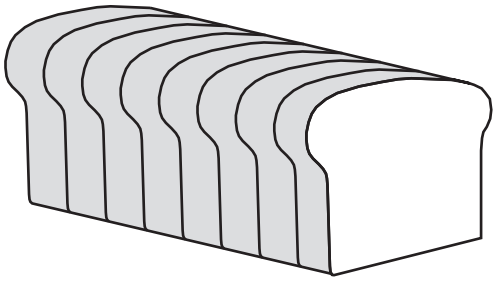


Key

× represents 1 friend

What is the most common number of pets Eric's friends have?

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

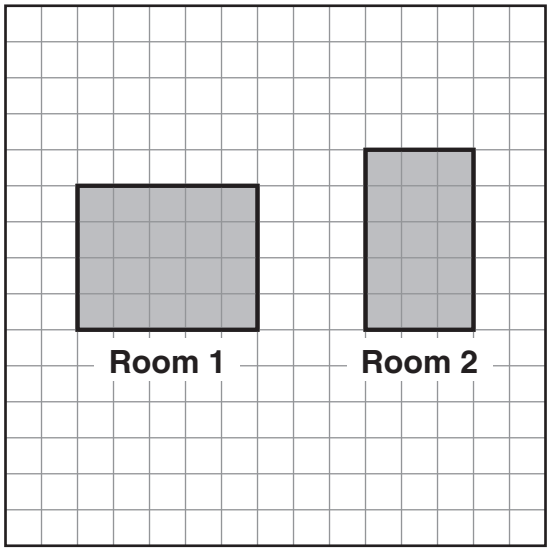
a. What fraction of the loaf of bread did Morgan and Trent eat?

b. What fraction of the loaf of bread is left over?

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

New England Common Assessment Program

Released Items Support Materials 2009

Grade 4 Mathematics

N&O 3.1 **Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** from 0 to 999 through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: $a/2$, $a/3$, $a/4$, $a/6$, or $a/8$, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and **decimals** (within a context of money) as a part of 100 **using models, explanations, or other representations**.

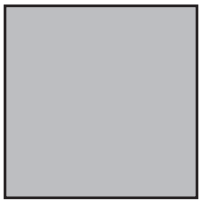
1 A number has 24 ones, 3 hundreds, and 15 tens.

What is the number?

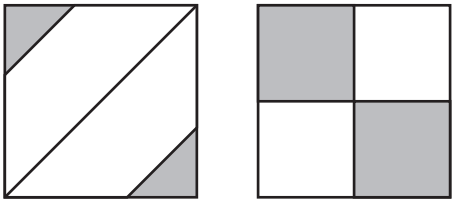
- A. 384
- B. 474
- C. 24,315
- D. 31,524

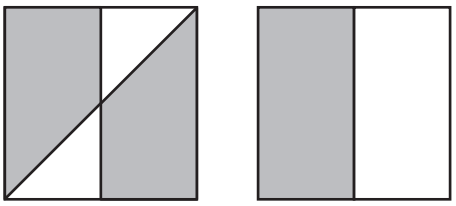
N&O 3.2 **Demonstrates understanding of the relative magnitude of numbers** from 0 to 999 by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, 250, 500, or 750); or by comparing whole numbers to each other; and comparing or identifying equivalent positive fractional numbers ($a/2$, $a/3$, $a/4$ where a is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

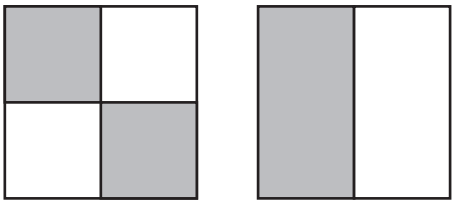
2 This model represents 1.

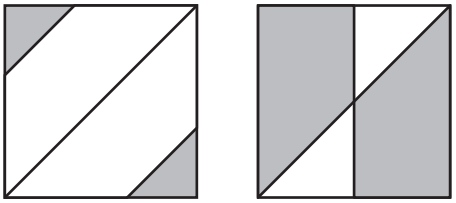


Which two models represent equivalent fractions?

○ A. 

○ B. 

○ C. 

○ D. 

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** by describing or illustrating the inverse relationship between addition and subtraction of whole numbers; and the relationship between repeated addition and multiplication using models, number lines, or explanations.

3 Look at this problem.

> Jessica gave Katie 3 sets of stamps. Each set has 6 stamps. What is the total number of stamps Jessica gave Katie?

In which pair can **both** number sentences be used to solve this problem?

○ A.
$3 + 6 = \square$
$6 + 6 + 6 = \square$

○ B.
$3 + 6 = \square$
$6 \times 6 \times 6 = \square$

○ C.
$3 \times 6 = \square$
$3 + 6 = \square$

○ D.
$3 \times 6 = \square$
$6 + 6 + 6 = \square$

N&O 3.4 **Accurately solves problems involving** addition and subtraction with and without regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money).

4 Lela bought these items at a yard sale.

Lela went to the sale with a five-dollar bill. How much money does Lela have left?

- A. $3.40
- B. $2.60
- C. $2.40
- D. $1.60

G&M 3.7 Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.

5 Emmet put an "S" on this calendar to show the day of his first soccer game in August.

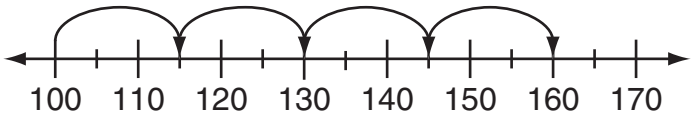
August						
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
			1	2	3	S 4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Emmet's second soccer game is exactly three weeks later. What is the date of his second soccer game?

- ○ A. August 7
- ○ B. August 18
- ○ C. August 24
- ○ D. August 25

F&A 3.1 **Identifies and extends to specific cases a variety of patterns** (linear and non-numeric) represented in models, tables, or sequences by extending the pattern to the next one, two, or three elements, or finding missing elements.

6 Malcolm drew arrows on this number line to make a number pattern.

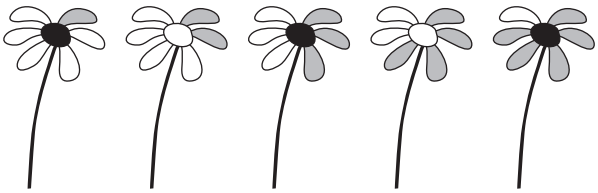


What is the next number an arrow should point to on the number line?

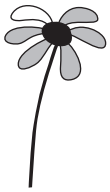
- A. 165
- B. 170
- C. 175
- D. 180

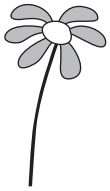
F&A 3.1 **Identifies and extends to specific cases a variety of patterns** (linear and non-numeric) represented in models, tables, or sequences by extending the pattern to the next one, two, or three elements, or finding missing elements.

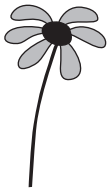
7 Look at this pattern.

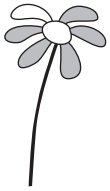


What flower comes next in the pattern?

○ A. 

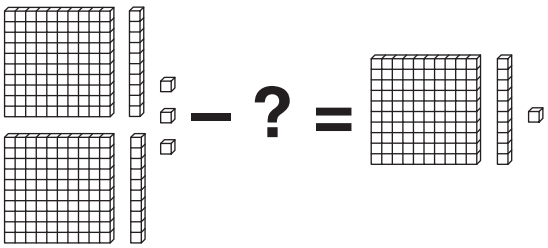
○ B. 

○ C. 

○ D. 

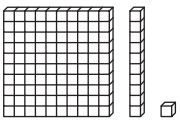
F&A 3.4 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions; or by finding the value that will make an open sentence true (e.g., 2 + □ = 7). (limited to one operation and limited to use addition, subtraction, or multiplication)

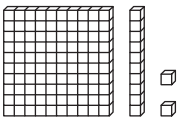
8 Look at the number sentence shown by these blocks.

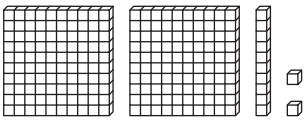


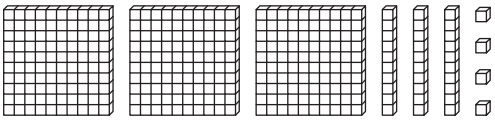
Key
represents 1

Which set of blocks makes the number sentence true?

○ A. 

○ B. 

○ C. 

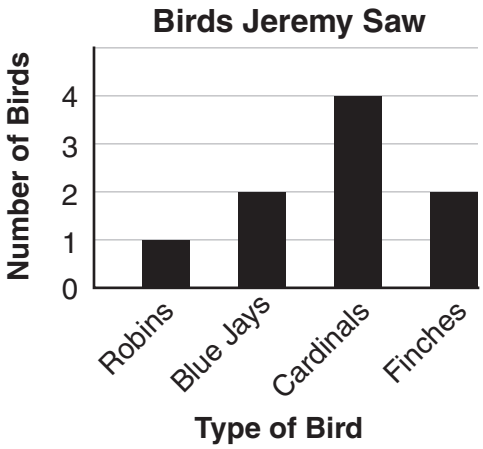
○ D. 

DSP 3.3 **Identifies or describes representations or elements of representations that best display a given set of data or situation**, consistent with the representations required in M(DSP)–3–1.

9 Jeremy saw some birds during a nature hike. The type of bird he saw **most** often was a robin. The type of bird he saw **least** often was a cardinal. Which bar graph could show the number of birds that Jeremy saw?

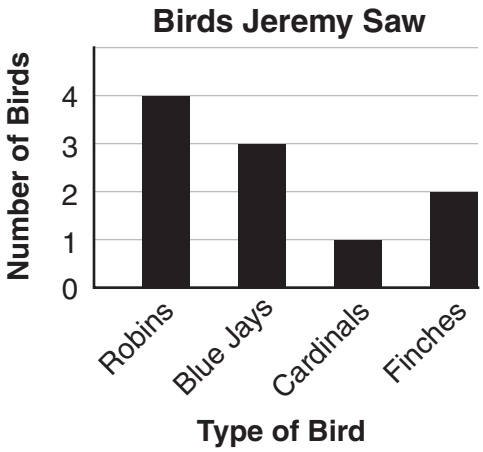
○ A.

○ B.



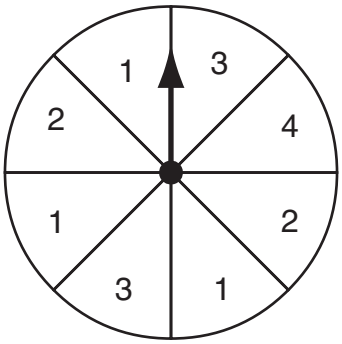
○ C.

○ D.



DSP 3.5 **For a probability event in which the sample space may or may not contain equally likely outcomes, determines** the likelihood of the occurrence of an event (using "more likely," "less likely," or "equally likely").

10 Look at this spinner.



On what number is the arrow **least** likely to land?

- A. 1
- B. 2
- C. 3
- D. 4

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** by describing or illustrating the inverse relationship between addition and subtraction of whole numbers; and the relationship between repeated addition and multiplication using models, number lines, or explanations.

⓫ Marco solved this multiplication problem.

$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

Write a number sentence using addition that Marco could use to check his work.

Scoring Guide

Score	Description
1	for correct answer, **10 + 10 + 10 = 30 or 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 30**
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Note: Do not penalize student for writing an expression.

Score Point 1
(Example A)

11 Marco solved this multiplication problem.

$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

Write a number sentence using addition that Marco could use to check his work.

10+10+10=30

The student's response is correct.

Score Point 1
(Example B)

11 Marco solved this multiplication problem.

$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

Write a number sentence using addition that Marco could use to check his work.

add 3 10 times.

3+3+3+3+3+3+3+3+3+3=30
3 6 9 12 15 18 21 24 27 30

The student's response is correct.

Score Point 0
(Example A)

11 Marco solved this multiplication problem.

$$\begin{array}{r} 10 \\ \times\ 3 \\ \hline 30 \end{array}$$

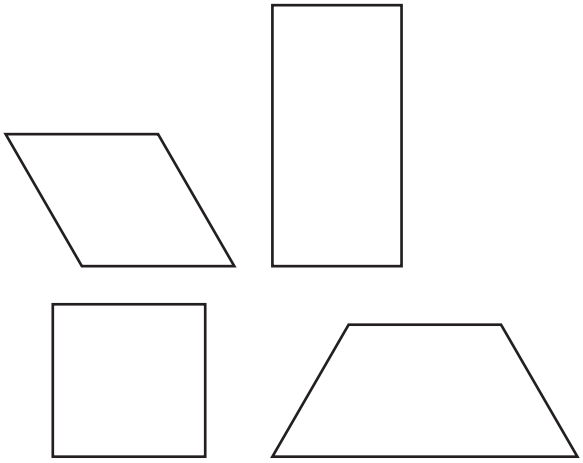
Write a number sentence using addition that Marco could use to check his work.

30 ÷ 3 = 10

The student's number sentence does not use addition.

G&M 3.1 **Uses properties or attributes of angles** (number of angles) **or sides** (number of sides or length of sides) or composition or decomposition of shapes **to identify, describe, or distinguish among** triangles, squares, rectangles, rhombi, trapezoids, hexagons, or circles.

⓬ Look at these shapes.

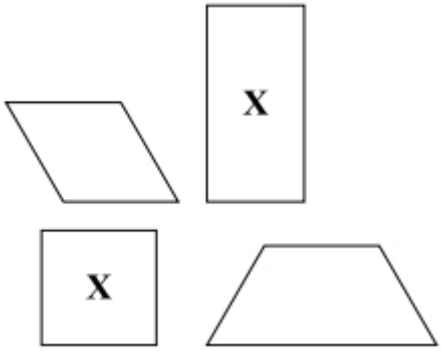


Put an X on each shape that is a rectangle.

Scoring Guide

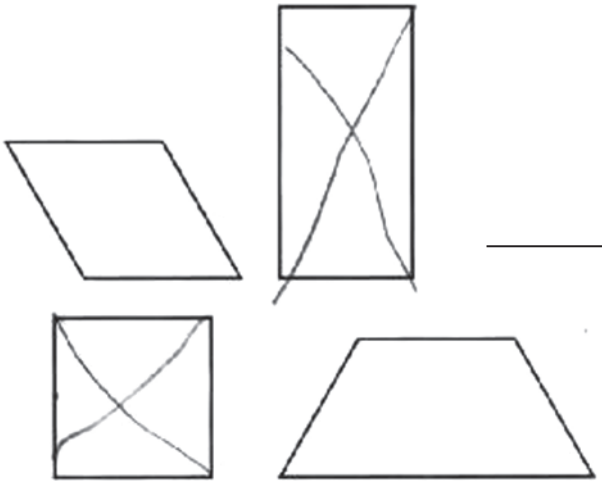
Score	Description
1	Student puts an X on the square and the rectangle only.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:



Score Point 1
(Example A)

⓬ Look at these shapes.

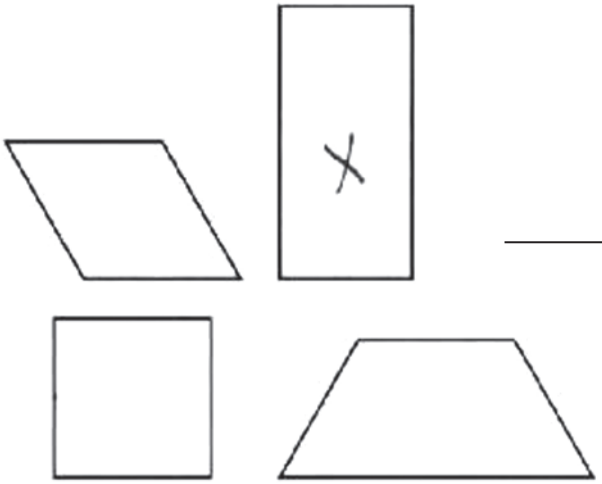


The student's response is correct.

Put an X on each shape that is a rectangle.

SCORE POINT 0
(EXAMPLE A)

⓬ Look at these shapes.

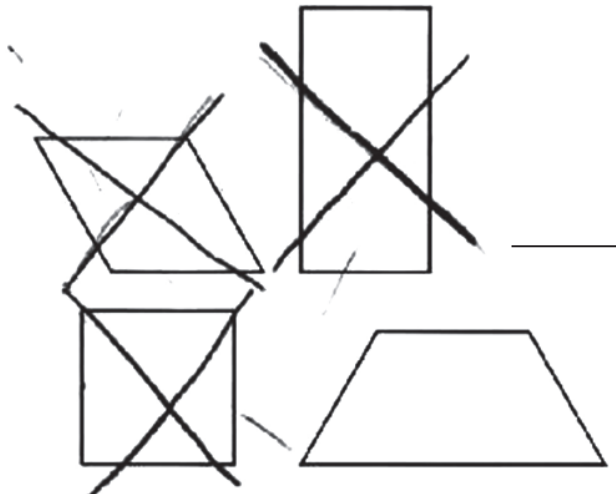


The student's response is incorrect.

Put an X on each shape that is a rectangle.

Score Point 0
(Example B)

⓬ Look at these shapes.

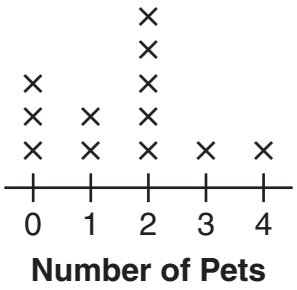


The student's response is incorrect.

Put an X on each shape that is a rectangle.

DSP 3.2 **Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using** most frequent (mode), least frequent, largest, or smallest.

13 Eric made this line plot to show how many pets his friends have.



Key

× represents 1 friend

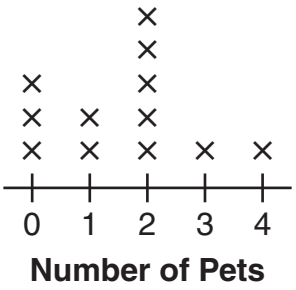
What is the most common number of pets Eric's friends have?

Scoring Guide

Score	Description
1	for correct answer, **2**
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

SCORE POINT 1
(EXAMPLE A)

13 Eric made this line plot to show how many pets his friends have.



Key

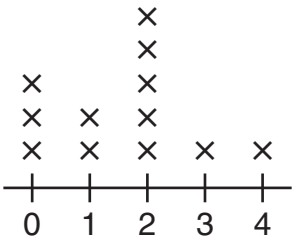
× represents 1 friend

What is the most common number of pets Eric's friends have? 2

The student's response is correct.

Score Point 0
(Example A)

13 Eric made this line plot to show how many pets his friends have.



Key
× represents 1 friend

5 Pets
Because has
a Lot of pets in
common

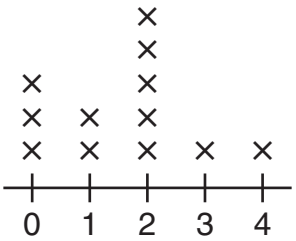
What is the most common number of pets Eric's friends have?

5 Pets

The student's response is incorrect.

Score Point 0
(Example B)

13 Eric made this line plot to show how many pets his friends have.



Key
× represents 1 friend

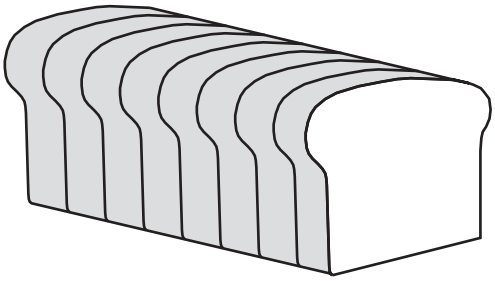
What is the most common number of pets Eric's friends have?

3 and 4

The student's response is incorrect.

N&O 3.1 **Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** from 0 to 999 through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: $a/2$, $a/3$, $a/4$, $a/6$, or $a/8$, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and **decimals** (within a context of money) as a part of 100 **using models, explanations, or other representations**.

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

b. What fraction of the loaf of bread is left over?

Scoring Guide

Score	Description
2	for correct answer in part a and part b
1	for correct answer in part a OR for correct answer in part b
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

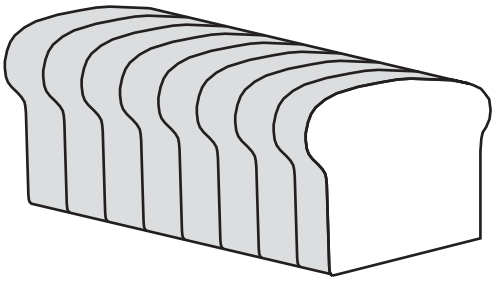
Sample Responses:

Part a: $\frac{3}{8}$ OR $\frac{2}{8}$ and $\frac{1}{8}$

Part b: $\frac{5}{8}$

Score Point 2
(Example A)

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

$\frac{3}{8}$

a) The student's response is correct.

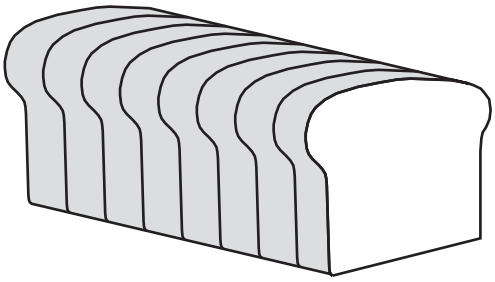
b. What fraction of the loaf of bread is left over?

$\frac{5}{8}$

b) The student's response is correct.

Score Point 2
(Example B)

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

Morgan $\frac{2}{8}$ Trent $\frac{1}{8}$

a) The student's response is correct.

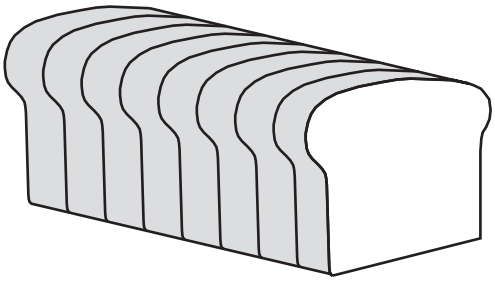
b. What fraction of the loaf of bread is left over?

$\frac{5}{8}$

b) The student's response is correct.

Score Point 1
(Example A)

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

$\frac{1}{2}$

a) The student's response is incorrect.

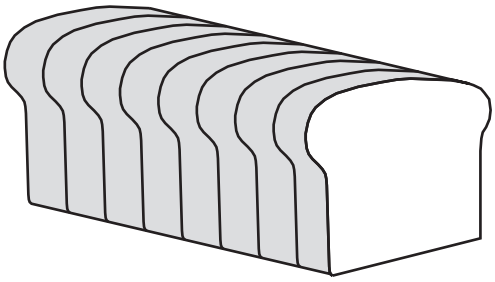
b. What fraction of the loaf of bread is left over?

$\frac{5}{8}$

b) The student's response is correct.

Score Point 1
(Example B)

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

$\frac{3}{8}$

a) The student's response is correct.

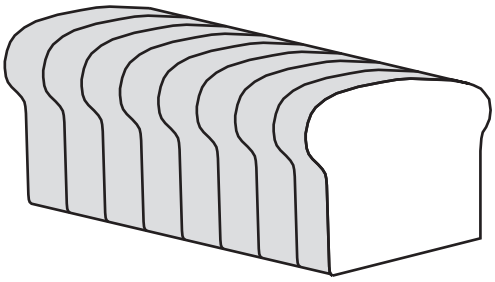
b. What fraction of the loaf of bread is left over?

$\frac{3}{5}$

b) The student's response is incorrect.

SCORE POINT 0
(EXAMPLE A)

14 Look at this loaf of bread.



Morgan ate 2 slices of bread. Trent ate 1 slice of bread.

a. What fraction of the loaf of bread did Morgan and Trent eat?

$\frac{8}{3}$

a) The student's response is incorrect.

b. What fraction of the loaf of bread is left over?

$\frac{8}{5}$

b) The student's response is incorrect.

N&O 3.4 **Accurately solves problems involving** addition and subtraction with and without regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money).

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.

Scoring Guide

Score	Description
2	for correct answer, **24**, with sufficient explanation given or work shown to indicate correct strategy
1	for correct answer with insufficient or no explanation given or work shown OR for appropriate strategy with incorrect or missing answer
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

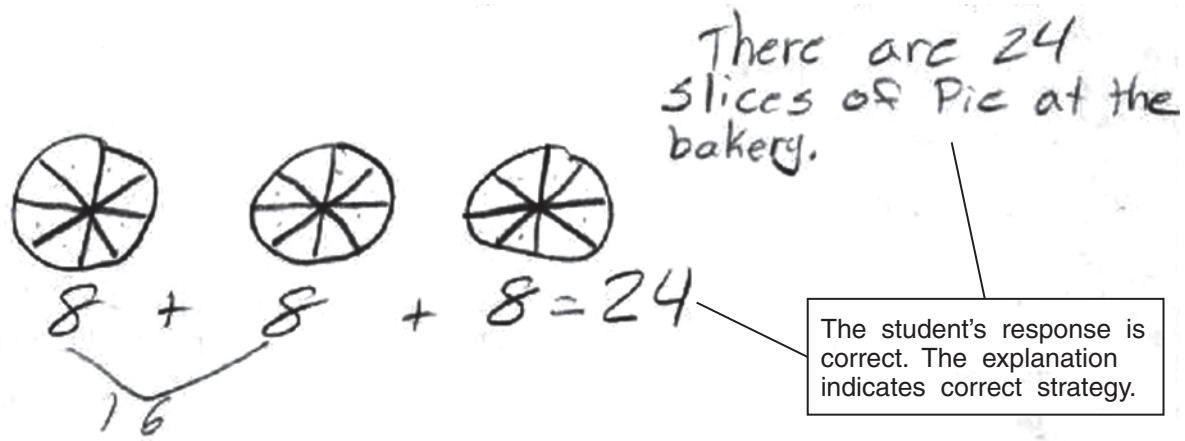
Training Notes

$8 + 8 + 8 = 24$
$3 \times 8 = 24$
a diagram showing 3 circles, each cut into 8 pieces

Score Point 2
(Example A)

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.

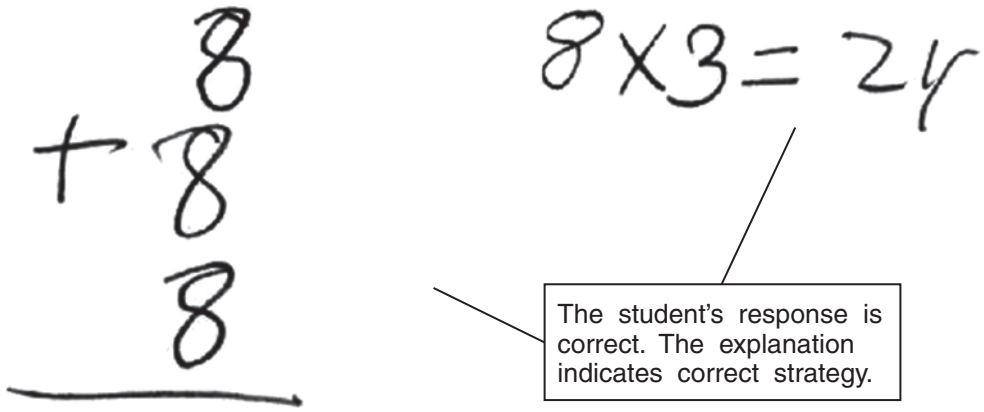


The student's response is correct. The explanation indicates correct strategy.

Score Point 2
(Example B)

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.



The student's response is correct. The explanation indicates correct strategy.

Score Point 1
(Example A)

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.

The student's response is incorrect, but with appropriate strategy.

Score Point 1
(Example B)

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.

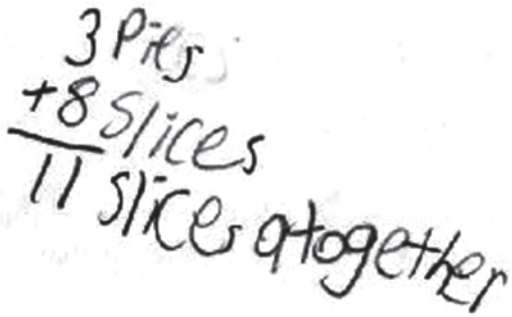
24

The student's response is correct, with no strategy or work shown.

Score Point 0
(Example A)

15 There are 3 pies at a bakery. Each pie is cut into 8 slices.

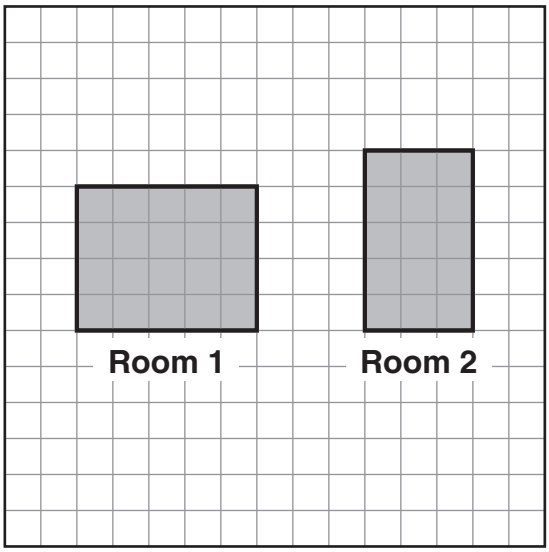
How many slices of pie are there? Show your work or use numbers, words, or pictures to explain how you know.



The student's strategy for finding the total number of slices is incorrect.

G&M 3.6 **Demonstrates conceptual understanding of perimeter of** polygons, and **the area of** rectangles on grids using a variety of models or manipulatives. Expresses all measures using appropriate units.

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

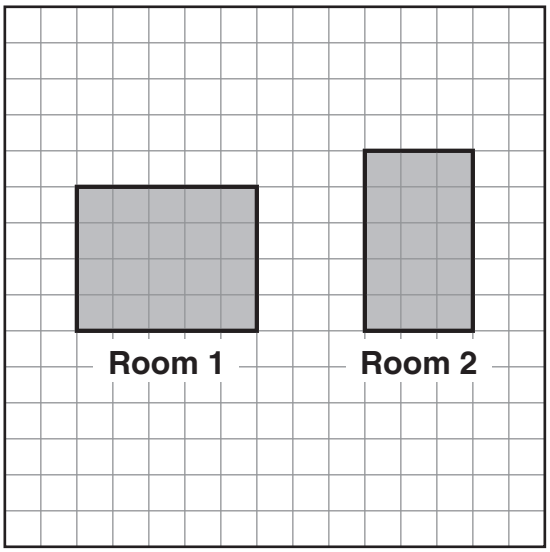
Scoring Guide

Score	Description
2	for correct answer, **5** (square yards), with sufficient explanation given or work shown to indicate correct strategy
1	for correct answer with insufficient or no explanation given or work shown OR for appropriate strategy with incorrect or missing answer
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Note: Do not penalize for using linear units instead of square units unless for a 2 score.

Score Point 2
(Example A)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

$\times \begin{matrix} 4 \\ 5 \end{matrix}$ 20 yards

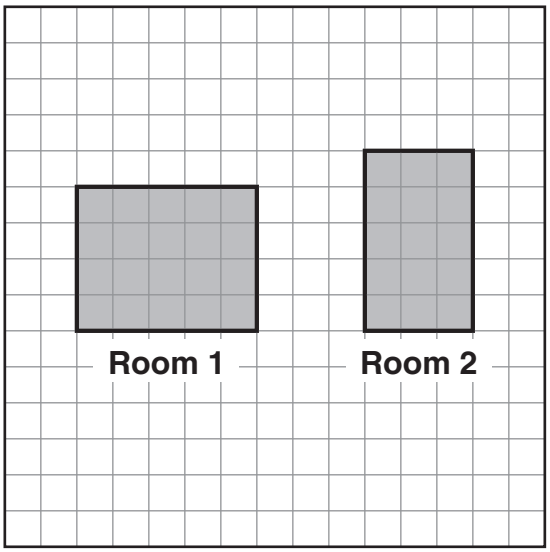
$\times \begin{matrix} 3 \\ 5 \end{matrix}$ 15 yards

My answer is in room 1 it has 5 more square yards than in room 2.

The student's response is correct. The explanation indicates correct strategy.

Score Point 2
(Example B)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

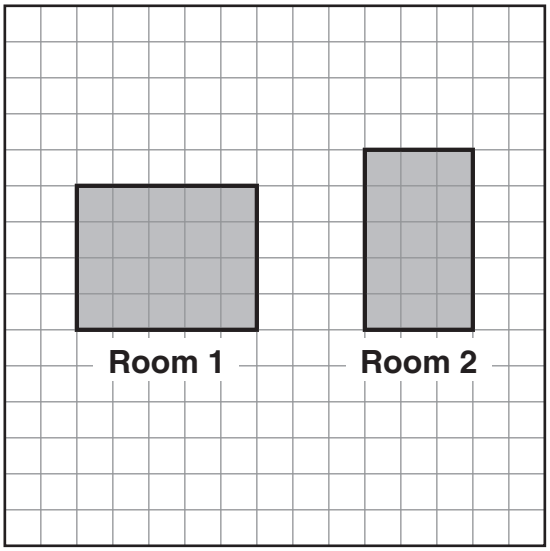
5 squares larger.

I know this because if you count the squares in room 1 and room 2 then subtract the number of squares in room 2 from room 1 you get 5

The student's response is correct. The explanation indicates correct strategy.

Score Point 1
(Example A)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

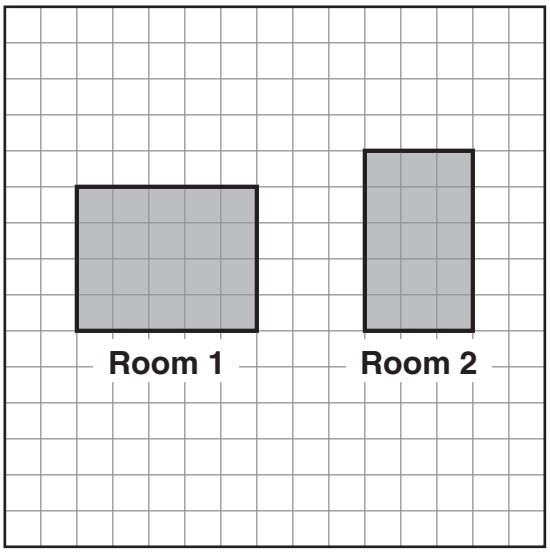
5 square yards

I counted the □'s

The student's response is correct. The explanation is insufficient.

Score Point 1
(Example B)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

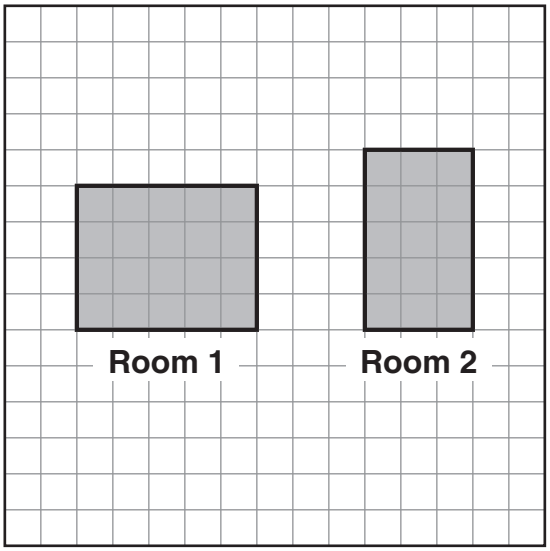
How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

Student gives sufficient explanation, but does not answer the question.

I know this because there are 20 squares in Room 1 and 15 squares in Room 2 and 20 is greater than 15.

Score Point 0
(Example A)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

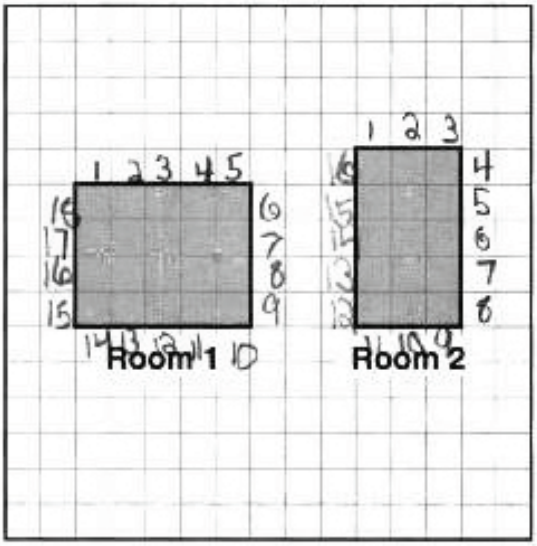
8 more squares

I counted the squares

The student's response is incorrect, with insufficient explanation to give credit for strategy.

Score Point 0
(Example B)

16 Room 1 and Room 2 are each shaped like a rectangle. A model of each room is shown below.



Key

☐ represents 1 square yard

How many square yards larger is the area of Room 1 than the area of Room 2? Explain how you know.

It is two more because if you subtract the minimum from the maximum you will get two.

The student's strategy for finding area is incorrect.

Grade 4 Mathematics Released Item Information

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No Tools Allowed	✓		✓	✓							✓				✓	
Content Strand[1]	NO	NO	NO	NO	GM	FA	FA	FA	DP	DP	NO	GM	DP	NO	NO	GM
GLE Code	3-1	3-2	3-3	3-4	3-7	3-1	3-1	3-4	3-3	3-5	3-3	3-1	3-2	3-1	3-4	3-6
Depth of Knowledge Code	2	2	2	2	1	2	2	2	2	1	2	2	2	2	2	2
Item Type[2]	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	SA	SA	SA	SA
Answer Key	B	C	D	D	D	C	B	B	D	D						
Total Possible Points	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2

[1]Content Strand: NO = Numbers & Operations, GM = Geometry & Measurement, FA = Functions & Algebra, DP = Data, Statistics, & Probability

[2]Item Type: MC = Multiple Choice, SA = Short Answer