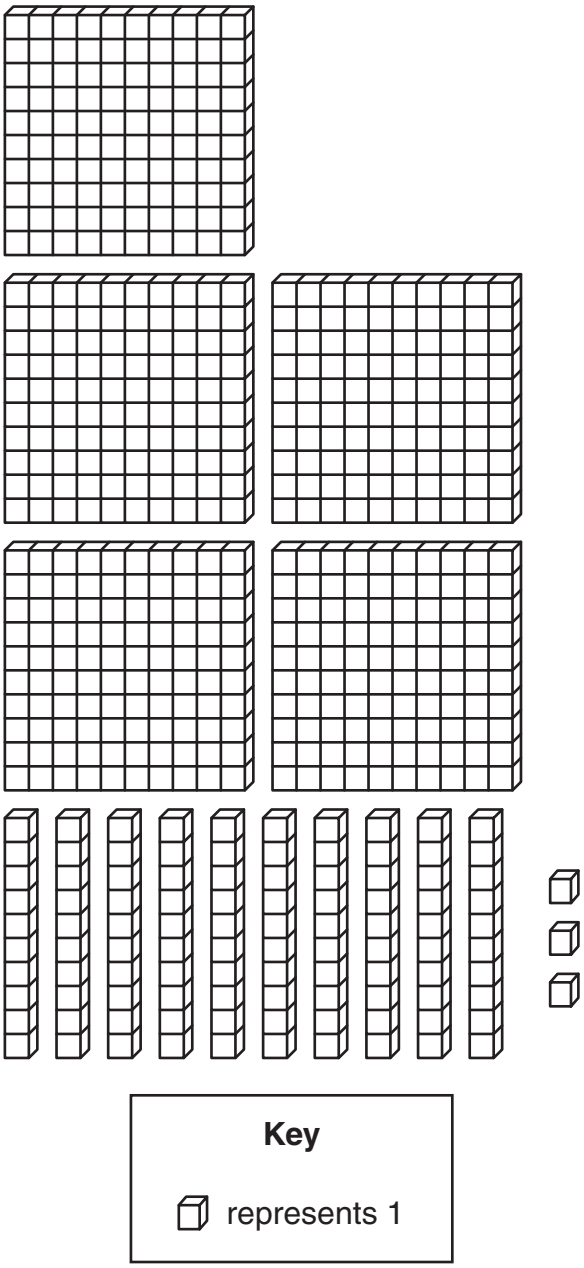
New England Common Assessment Program

Released Items Support Materials 2011

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 Look at these blocks.



What is the total value of the blocks?

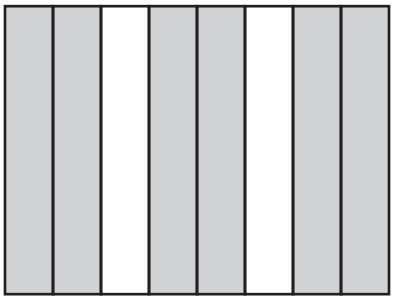
- A. 593
- B. 603
- C. 5103
- D. 6103

*Question #1 is continued in next column.**

* Item appeared differently in test booklet.

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**.

2 Look at this rug.

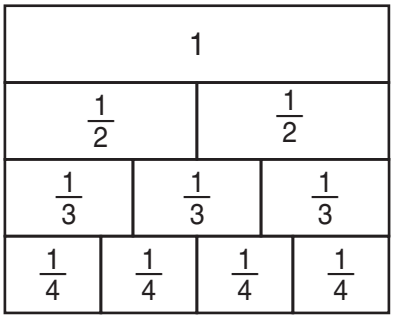


What fraction of the rug is gray?

- A. $\frac{2}{6}$
- B. $\frac{1}{2}$
- C. $\frac{2}{3}$
- D. $\frac{6}{8}$

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.

3 You may use this model to answer this question.



Kendra lives $\frac{1}{3}$ mile from school.

Bonita lives $\frac{3}{4}$ mile from school.

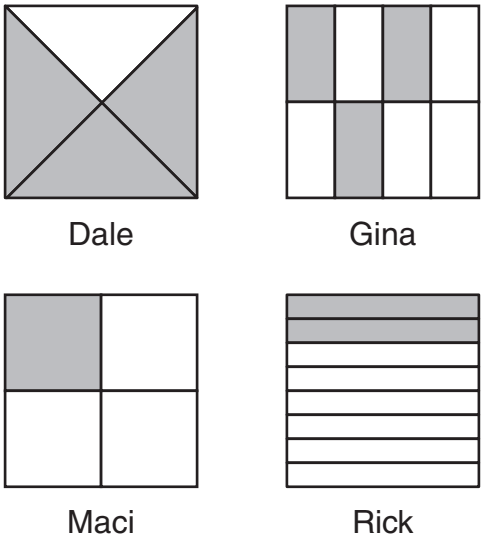
Stefan lives $\frac{1}{2}$ mile from school.

Which list shows the students in order from **the shortest to the greatest** distance between home and school?

- ○ A. Kendra, Stefan, Bonita
- ○ B. Kendra, Bonita, Stefan
- ○ C. Stefan, Kendra, Bonita
- ○ D. Bonita, Kendra, Stefan

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.

4 Four students each shaded part of a square gray to show fractions of a whole.



Which two students showed equivalent fractions?

- ○ A. Maci and Gina
- ○ B. Gina and Dale
- ○ C. Maci and Rick
- ○ D. Rick and Dale

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.

5 Wally solved this problem.

$$\begin{array}{r} 75 \\ -20 \\ \hline 55 \end{array}$$

Which number sentence could Wally use to check his answer?

- A. $75 + 20 = \square$
- B. $55 - 20 = \square$
- C. $55 + 20 = \square$
- D. $20 - 75 = \square$

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).

6 The regular price of a book is \$15.95. The sale price is \$3.25 less than the regular price. What is the sale price?

- A. \$12.00
- B. \$12.70
- C. \$12.75
- D. \$19.20

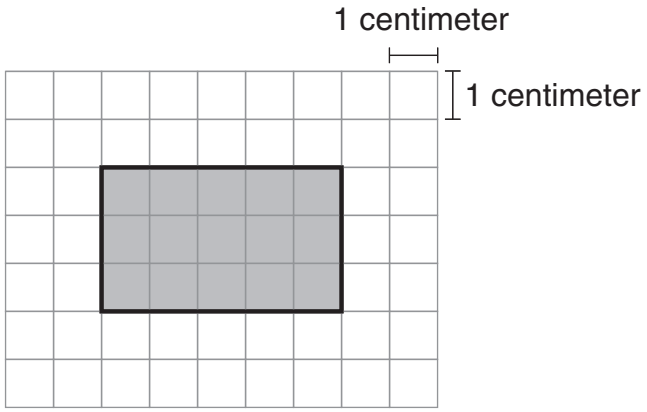
G&M 3.1 **Uses properties or attributes of angles** (number of angles) **or sides** (number of sides or length of sides) or composition or decomposition of shapes **to identify, describe, or distinguish among** triangles, squares, rectangles, rhombi, trapezoids, hexagons, or circles.

7 Which shape **always** has four sides that are the same length?

- A. rectangle
- B. rhombus
- C. trapezoid
- D. hexagon

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.

8 Look at this rectangle that is shaded gray on the grid below.

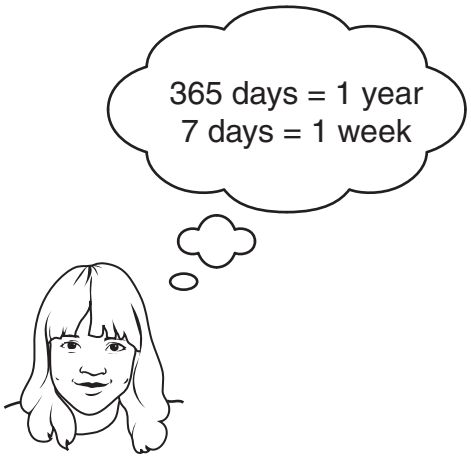


What is the perimeter of the rectangle that is shaded gray?

- A. 8 centimeters
- B. 10 centimeters
- C. 15 centimeters
- D. 16 centimeters

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.

9 How many days are in 2 years and 3 weeks?



- A. 221 days
- B. 372 days
- C. 730 days
- D. 751 days

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)

10 Look at this number sentence.

$$4 \times \square = 2 \times 10$$

What number makes this number sentence true?

- A. 5
- B. 8
- C. 20
- D. 80

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).

11 Mrs. Perez bought 3 boxes of garbage bags. Each box has 12 garbage bags. She used 2 garbage bags. How many garbage bags does Mrs. Perez have left?

Scoring Guide:

Score	Description
1	for correct answer, **34**
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)

11 Mrs. Perez bought 3 boxes of garbage bags. Each box has 12 garbage bags. She used 2 garbage bags. How many garbage bags does Mrs. Perez have left?

$$\begin{array}{r} 3 \\ \times 12 \\ \hline 36 \\ -\ 2 \\ \hline 34 \end{array}$$

34 garbage bags

The student's answer is correct. (Showing work is not required.)

Score Point 1
(Example B)

11 Mrs. Perez bought 3 boxes of garbage bags. Each box has 12 garbage bags. She used 2 garbage bags. How many garbage bags does Mrs. Perez have left?

34 bags

The student's answer is correct.

Score Point 0

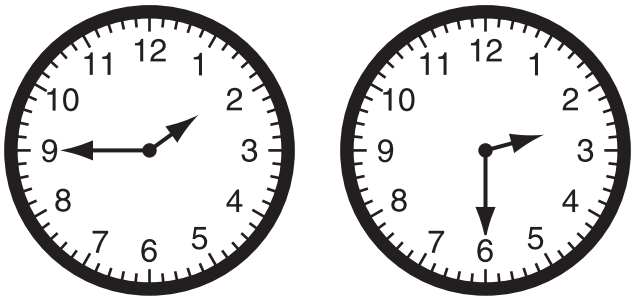
11 Mrs. Perez bought 3 boxes of garbage bags. Each box has 12 garbage bags. She used 2 garbage bags. How many garbage bags does Mrs. Perez have left?

36 bags

The student's answer is incorrect.

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.

⓬ These clocks show the time art class starts and the time art class ends.



Start time End time

How long, in minutes, is art class?

_____ minutes

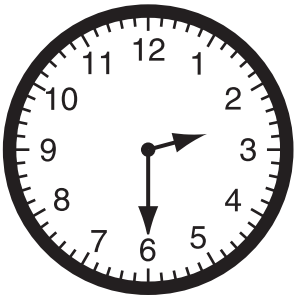
Scoring Guide:

Score	Description
1	for correct answer, **45**
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)

12 These clocks show the time art class starts and the time art class ends.

Start time



End time

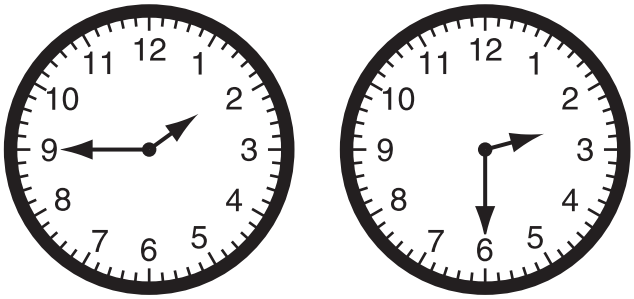
How long, in minutes, is art class?

45 minutes

The student's answer is correct.

Score Point 1
(Example B)

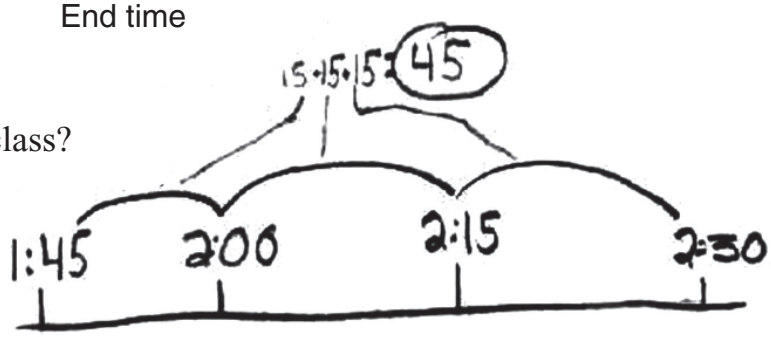
12 These clocks show the time art class starts and the time art class ends.



Start time End time

How long, in minutes, is art class?

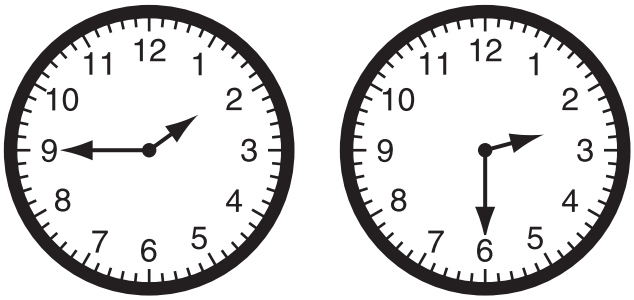
45 minutes



The student's answer is correct. (Showing work is not required.)

Score Point 0

12 These clocks show the time art class starts and the time art class ends.



Start time End time

How long, in minutes, is art class?

2:30 minutes

The student's answer is incorrect.

DSP 3.1 **Interprets a given representation** (line plots, tally charts, tables, or bar graphs) to answer questions related to the data, to analyze the data to formulate conclusions, or to make predictions.

13 A class voted to choose **two** flavors of ice cream to have at a party. This chart shows the number of votes each flavor of ice cream received.

Ice-Cream Party

Flavor	Number of Votes
Chocolate	8
Vanilla	5
Strawberry	2
Peanut Butter	4
Fudge Swirl	5

Explain whether the class should vote again.

Scoring Guide:

Score	Description
1	for sufficient explanation
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

13 A class voted to choose **two** flavors of ice cream to have at a party. This chart shows the number of votes each flavor of ice cream received.

Ice-Cream Party

Flavor	Number of Votes
Chocolate	8
Vanilla	5
Strawberry	2
Peanut Butter	4
Fudge Swirl	5

The student's explanation is sufficient.

Explain whether the class should vote again.

the class should votagain because Fudge Swirl and Vanilla got the same camount of votes

Score Point 0
(Example A)

13 A class voted to choose **two** flavors of ice cream to have at a party. This chart shows the number of votes each flavor of ice cream received.

Ice-Cream Party

Flavor	Number of Votes
Chocolate	8
Vanilla	5
Strawberry	2
Peanut Butter	4
Fudge Swirl	5

The student's response is incorrect.

Explain whether the class should vote again.

The class Should not vote again because My favrite kind of ice cream is chocolate.

Score Point 0
(Example B)

13 A class voted to choose **two** flavors of ice cream to have at a party. This chart shows the number of votes each flavor of ice cream received.

Ice-Cream Party

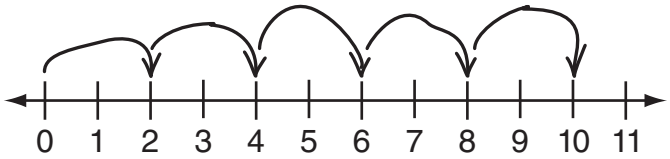
Flavor	Number of Votes
Chocolate	8
Vanilla	5
Strawberry	2
Peanut Butter	4
Fudge Swirl	5

The student's response is incorrect.

Explain whether the class should vote again. The class should vote again because they might change their mind.

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.

14 Jamie counted paper clips in groups of 2. He used this number line to show his work.



a. Write an addition sentence Jamie could use to show his work.

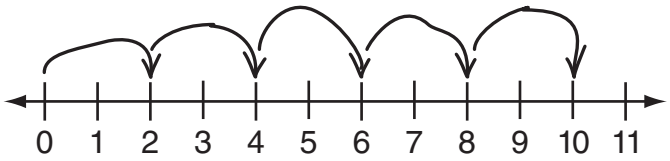
b. Write a multiplication sentence Jamie could use to show his work.

Scoring Guide:

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

Score Point 2

14 Jamie counted paper clips in groups of 2. He used this number line to show his work.



a. Write an addition sentence Jamie could use to show his work.

2+2+2+2+2=10

a) The student's response is correct.

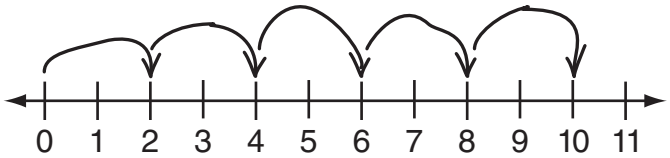
b. Write a multiplication sentence Jamie could use to show his work.

2X5=10

b) The student's response is correct.

Score Point 1
(Example A)

14 Jamie counted paper clips in groups of 2. He used this number line to show his work.



a. Write an addition sentence Jamie could use to show his work.

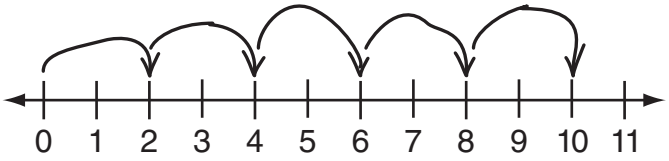
a) The student's response is incorrect.

b. Write a multiplication sentence Jamie could use to show his work.

b) The student's response is correct.

Score Point 1
(Example B)

14 Jamie counted paper clips in groups of 2. He used this number line to show his work.



a. Write an addition sentence Jamie could use to show his work.

2+2+2+2+2= 10

a) The student's response is correct.

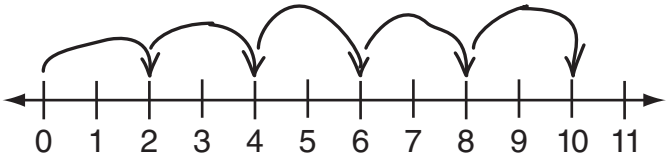
b. Write a multiplication sentence Jamie could use to show his work.

2X5=12

b) The student's response is incorrect.

Score Point 0

14 Jamie counted paper clips in groups of 2. He used this number line to show his work.



a. Write an addition sentence Jamie could use to show his work.

2 x 5 = 10

a) The student's response is incorrect.

b. Write a multiplication sentence Jamie could use to show his work.

2+2+2+2+2=10
4 + 4 + 2 = 10

b) The student's response is incorrect.

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.

15 Jerome used number cards to make this number pattern.

6	14	22	30		

a. On the cards, write the next two numbers in Jerome's pattern.

Katherine uses the same rule as Jerome to make a new pattern. One number in Katherine's pattern is shown on these cards.

	12		

b. On the cards, write the missing numbers in Katherine's pattern.

Scoring Guide:

Score	Description
2	for correct answer in part a, **38**, **46**, and in part b, **4**, **20**, **28**
1	for correct answer in part a only OR for correct answer in part b only OR for correct answer in part b based on an incorrect response in part a
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Score Point 2

15 Jerome used number cards to make this number pattern.

6	14	22	30	38	46

a. On the cards, write the next two numbers in Jerome's pattern.

a) The student's answer is correct.

Katherine uses the same rule as Jerome to make a new pattern. One number in Katherine's pattern is shown on these cards.

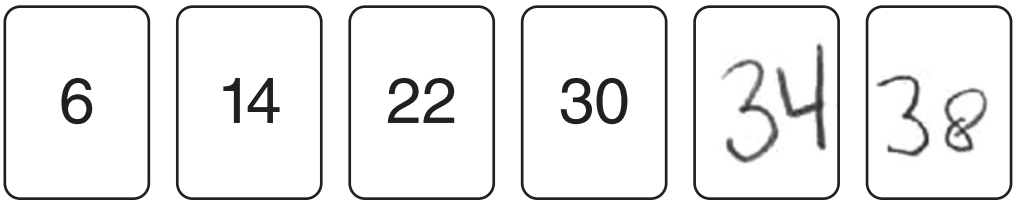
4	12	20	28

b. On the cards, write the missing numbers in Katherine's pattern.

b) The student's answer is correct.

Score Point 1
(Example A)

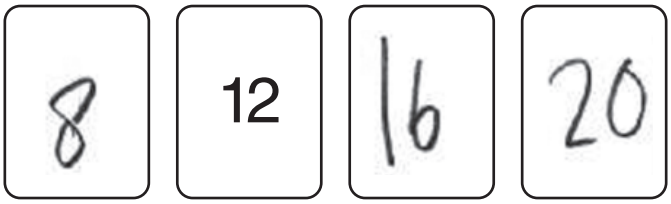
15 Jerome used number cards to make this number pattern.



a. On the cards, write the next two numbers in Jerome's pattern.

a) The student's answer is incorrect.

Katherine uses the same rule as Jerome to make a new pattern. One number in Katherine's pattern is shown on these cards.



b. On the cards, write the missing numbers in Katherine's pattern.

b) The student's answer is correct based on incorrect answer in part a.

Score Point 1
(Example B)

15 Jerome used number cards to make this number pattern.

6	14	22	30	38	46

a. On the cards, write the next two numbers in Jerome's pattern.

a) The student's answer is correct.

Katherine uses the same rule as Jerome to make a new pattern. One number in Katherine's pattern is shown on these cards.

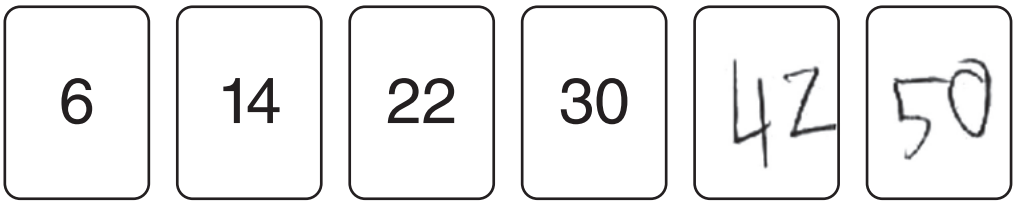
6	12	18	24

b. On the cards, write the missing numbers in Katherine's pattern.

b) The student's answer is incorrect.

Score Point 0

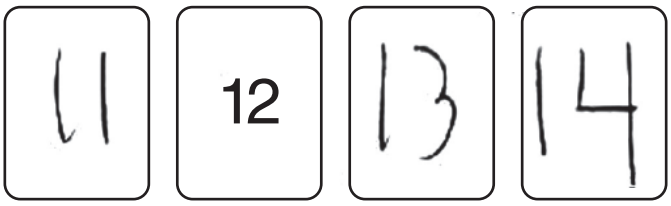
15 Jerome used number cards to make this number pattern.



a. On the cards, write the next two numbers in Jerome's pattern.

a) The student's answer is incorrect.

Katherine uses the same rule as Jerome to make a new pattern. One number in Katherine's pattern is shown on these cards.



b. On the cards, write the missing numbers in Katherine's pattern.

b) The student's answer is incorrect.

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").

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	
Green	
Blue	

Scoring Guide:

Score	Description
2	for correct and complete chart that shows a **total of 10 marbles, blue = red, and green > red**
1	completes chart that meets two conditions
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Score Point 2
(Example A)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	1
Green	8
Blue	1

The student's response is correct.

Score Point 2
(Example B)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	000
Green	0000
Blue	000

The student's response is correct.

Score Point 1
(Example A)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	4
Green	5
Blue	1

The student's response meets two conditions.

Score Point 1
(Example B)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	4
Green	6
Blue	4

The student's response meets two conditions.

Score Point 0
(Example A)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	5
Green	3
Blue	2

The student's response meets only one condition.

Score Point 0
(Example B)

16 Fred put red, green, and blue marbles into a bag. He put a total of 10 marbles into the bag. Fred will pick a marble from the bag without looking. He is **equally likely** to pick a red or blue marble and **more likely** to pick a green marble than a red marble.

Complete this chart to show the number of each color marble Fred could have put into the bag.

Marbles in Fred's Bag

Color	Number of Marbles
Red	30
Green	10
Blue	40

The student's response is incorrect, no conditions are met.

Grade 4 Mathematics Released Item Information – 2011

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	NO	NO	GM	GM	GM	FA	NO	GM	DP	NO	FA	DP
GLE Code	3-1	3-1	3-2	3-2	3-3	3-4	3-1	3-6	3-7	3-4	3-4	3-7	3-1	3-3	3-1	3-5
Depth of Knowledge Code	1	1	1	2	2	1	2	2	2	2	2	2	3	2	2	3
Item Type[2]	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	SA	SA	SA	SA
Answer Key	B	D	A	C	C	B	B	D	D	A						
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