



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

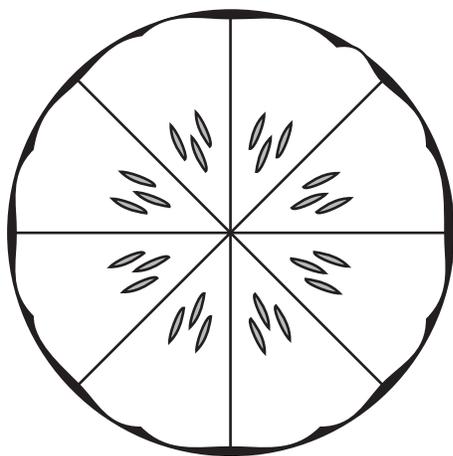
**Released Items
Support Materials
2012**

**Grade 4
Mathematics**

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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: $\frac{a}{2}$, $\frac{a}{3}$, $\frac{a}{4}$, $\frac{a}{6}$, or $\frac{a}{8}$, 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 this pie.



Juan took $\frac{2}{8}$ of the pie. Susie took $\frac{1}{8}$.

Lori took $\frac{1}{8}$. How much of the pie was

left over?

- A. $\frac{1}{8}$
- B. $\frac{2}{8}$
- C. $\frac{3}{8}$
- D. $\frac{4}{8}$

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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: $\frac{a}{2}$, $\frac{a}{3}$, $\frac{a}{4}$, $\frac{a}{6}$, or $\frac{a}{8}$, 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 What number has exactly 12 ones, 5 hundreds, and 20 tens?
- A. 712
 - B. 802
 - C. 12,520
 - D. 52,012

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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 This table shows the number of library books at some schools.

School	Number of Library Books
King Elementary	480
Central Elementary	528
Johnson Elementary	465
Lincoln Elementary	551

Which school has the number of books **closest** to 500?

- A. King Elementary
- B. Central Elementary
- C. Johnson Elementary
- D. Lincoln Elementary

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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.



4 Molly solved this problem.

$$\begin{array}{r} 275 \\ -119 \\ \hline 156 \end{array}$$

Which number sentence could Molly use to check her work?

- A. $156 + 119 = \square$
- B. $156 - 119 = \square$
- C. $275 + 119 = \square$
- D. $275 + 156 = \square$

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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 Sandy is solving this problem.

$$5 \times 6 = \square$$

How could Sandy use counters to solve this problem?

- A. Make 11 groups with 1 counter in each group.
- B. Make 30 groups with 5 counters in each group.
- C. Make 5 groups with 6 counters in each group.
- D. Make 6 groups with 30 counters in each group.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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).

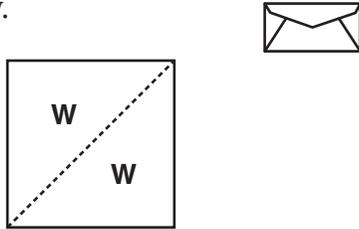


- 6 Amy bought 3 packages of buttons. Each package had 8 buttons. She used 19 buttons to make puppets. How many buttons does Amy have left?
- A. 5
 - B. 8
 - C. 15
 - D. 43

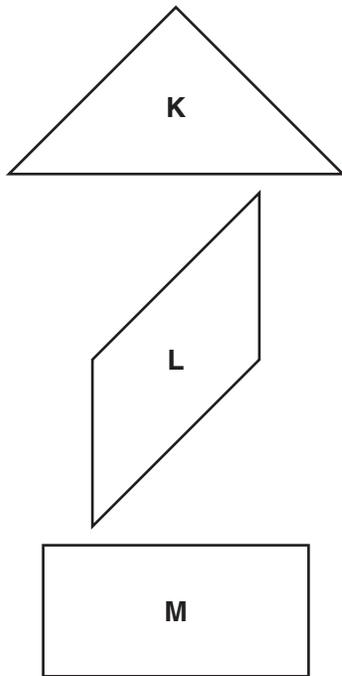
NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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 Kim cut this square into two triangles as shown below.



She tried to make these shapes with the two triangles.



Which shapes can Kim make?

- A. K and L only
- B. L and M only
- C. K and M only
- D. K, L, and M

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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., $2 + \square = 7$). (limited to one operation and limited to use addition, subtraction, or multiplication)

8 Look at this number sentence.

$$4 \times 4 \times \boxed{?} = 8 \times 2$$

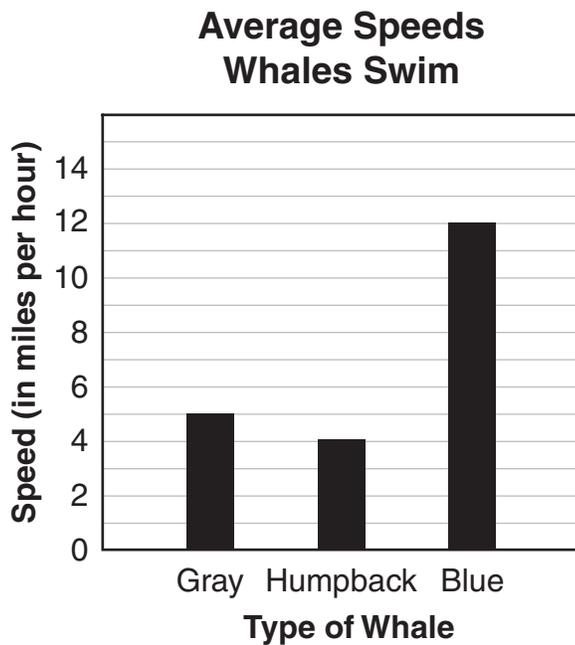
What number makes this number sentence true?

- A. 0
- B. 1
- C. 2
- D. 16

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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. (IMPORTANT: *Analyzes data consistent with concepts and skills in DSP 3.2.*)

- 9 This bar graph shows the average speeds three different types of whales can swim.



How much faster does a blue whale swim than a gray whale swims?

- A. 5 miles per hour
- B. 6 miles per hour
- C. 7 miles per hour
- D. 8 miles per hour

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 DSP 3.1.

- 10 Ms. Lang asked the students in her class, “What color is your backpack?” This tally chart shows the students’ answers.

Backpack Colors

Color	Number of Students
Blue	
Purple	
Red	
Green	
Pink	
Black	

Ms. Lang wants to use the information in the tally chart to make a bar graph. How many bars will be on the bar graph?

- A. 2
- B. 6
- C. 7
- D. 18

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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.

11 Look at this number sentence.

$$6 + 6 + 6 = \square$$

Write a multiplication sentence that means the same as this number sentence.

Scoring Guide:

Score	Description
1	for a correct multiplication sentence
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

- 11 Look at this number sentence.

$$6 + 6 + 6 = \boxed{18}$$

Write a multiplication sentence that means the same as this number sentence.

$$3 \times 6 = 18$$

The student's response is correct.

SCORE POINT 1
(EXAMPLE B)

- 11 Look at this number sentence.

$$6 + 6 + 6 = \square$$

Write a multiplication sentence that means the same as this number sentence.

$$6 \times 3 = 18$$

The student's response is correct.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0

- 11 Look at this number sentence.

$$6 + 6 + 6 = \square$$

Write a multiplication sentence that means the same as this number sentence.

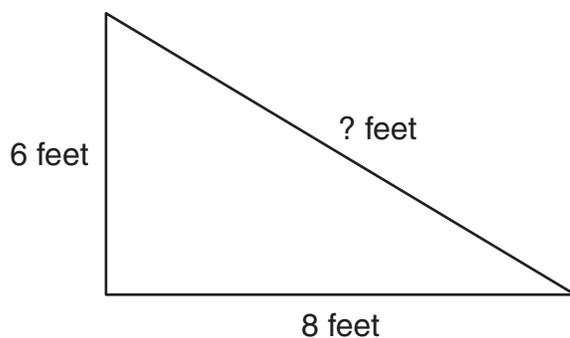
$$6 + 6 + 6 = 18$$

The student's response is incorrect.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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.

12 Look at this triangle.



The perimeter of the triangle is 24 feet. What is the length of the third side?

_____ feet

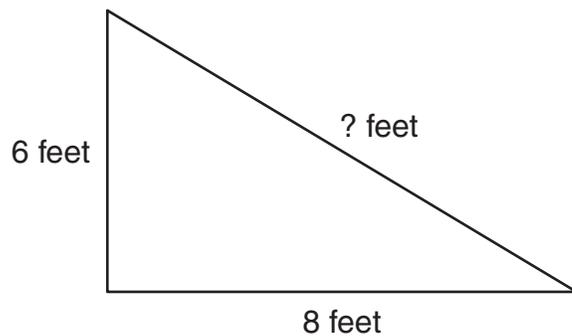
Scoring Guide:

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

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

- 12 Look at this triangle.



The perimeter of the triangle is 24 feet. What is the length of the third side?

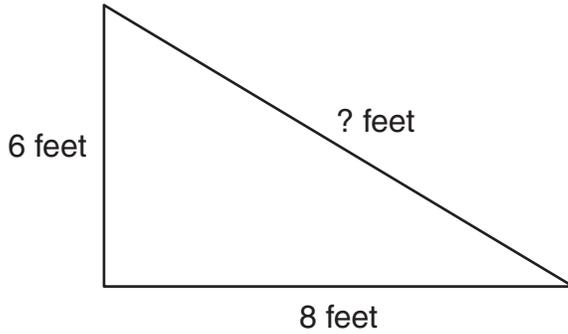
10 feet

The student's response is correct.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE B)

12 Look at this triangle.



The perimeter of the triangle is 24 feet. What is the length of the third side?

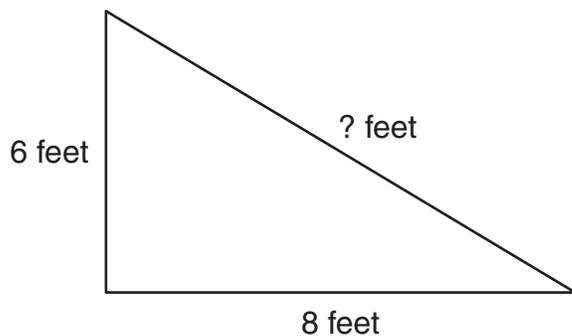
10 feet $6 + 8 = 14$ $\begin{array}{r} 24 \\ - 14 \\ \hline 10 \end{array}$ answer

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

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0

- 12 Look at this triangle.



The perimeter of the triangle is 24 feet. What is the length of the third side?

11 feet

The student's response is incorrect.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

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., $2 + \square = 7$). (limited to one operation and limited to use addition, subtraction, or multiplication)

13 Look at this number sentence.

$$\triangle = 10 - \triangle$$

Each triangle has the same value. What is the value of each triangle?

Scoring Guide:

Score	Description
1	for correct answer, 5
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

- 13 Look at this number sentence.

$$\triangle 5 = 10 - \triangle 5$$

The student's response is correct.

Each triangle has the same value. What is the value of each triangle?

SCORE POINT 1
(EXAMPLE B)

- 13 Look at this number sentence.

$$\triangle = 10 - \triangle$$

Each triangle has the same value. What is the value of each triangle?

5

The student's response is correct.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0
(EXAMPLE A)

- 13 Look at this number sentence.

$$\triangle_{10} = 10 - \triangle_{20}$$

The student's response is incorrect.

Each triangle has the same value. What is the value of each triangle?

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0
(EXAMPLE B)

- 13 Look at this number sentence.

$$\triangle 7 = 10 - \triangle 3$$

The student's response is incorrect.

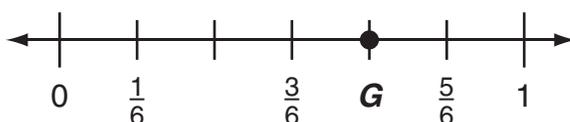
Each triangle has the same value. What is the value of each triangle?

The value of each triangle is three because a triangle has three sides. Since the value of each triangle is three you do ten minus three equals seven.

**NECAP 2012 RELEASED ITEMS
GRADE 4 MATH**

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.

14 Look at this number line.



a. What fraction does point G represent on the number line?

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

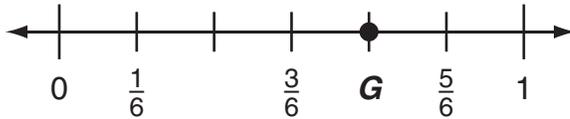
Scoring Guide:

Score	Description
2	for correct answer in part a, $\frac{4}{6}$ or equivalent , and in part b
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 answer 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

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE A)

14 Look at this number line.



a. What fraction does point *G* represent on the number line?

$\frac{4}{6}$

Part a: The student's response is correct.

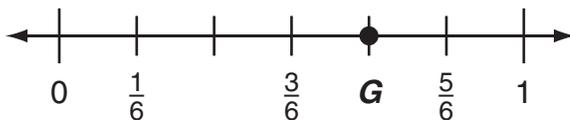
b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

$\frac{2}{3}$

Part b: The student's response is correct.

SCORE POINT 2
(EXAMPLE B)

14 Look at this number line.



a. What fraction does point *G* represent on the number line?

$\frac{4}{6}$

Part a: The student's response is correct.

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

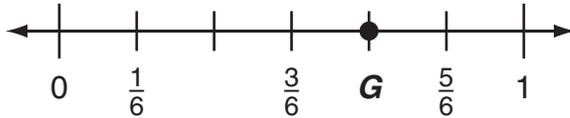
$\frac{8}{12}$

Part b: The student's response is correct.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

14 Look at this number line.



a. What fraction does point *G* represent on the number line?

$$\frac{4}{6}$$

Part a: The student's response is correct.

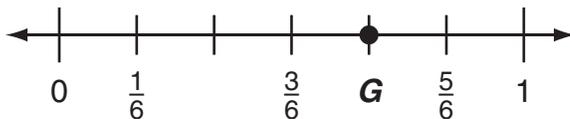
b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

Part b: The student's response is incorrect.

$$\frac{3}{7}$$

SCORE POINT 1
(EXAMPLE B)

14 Look at this number line.



a. What fraction does point *G* represent on the number line?

$$\frac{1}{2}$$

Part a: The student's response is incorrect.

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

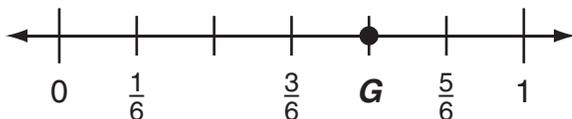
$$\frac{2}{4}$$

Part b: The student's response is correct based on an incorrect answer in part a.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0

- 14 Look at this number line.



- a. What fraction does point G represent on the number line?

$$\frac{6}{4}$$

Part a: The student's response is incorrect.

- b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

$$\frac{7}{5}$$

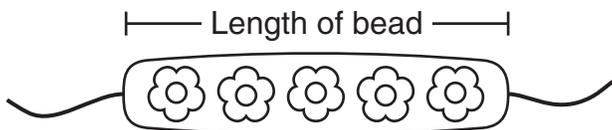
Part b: The student's response is incorrect.

**NECAP 2012 RELEASED ITEMS
GRADE 4 MATH**

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.

15 Use your ruler to answer this question.

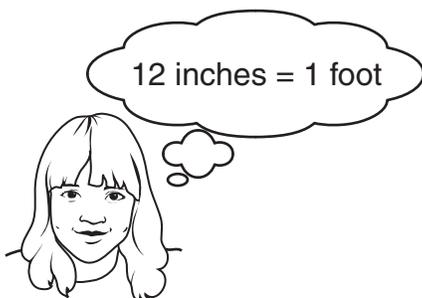
Monique has a set of beads. Each of her beads is the same length as this bead.



a. What is the length of this bead to the nearest inch?

_____ inches

Monique wants to put 1 foot 6 inches of her beads on a string.



b. What is the total number of beads Monique needs?

Scoring Guide:

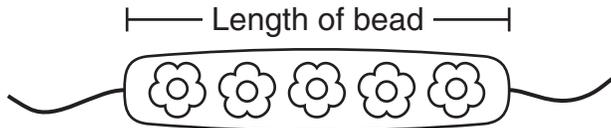
Score	Description
2	for correct answer in part a, 2 , and in part b, 9
1	for correct answer in part a only OR for correct answer in part b only OR for correct answer in part b based on an incorrect answer in part a
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE A)

- 15 Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

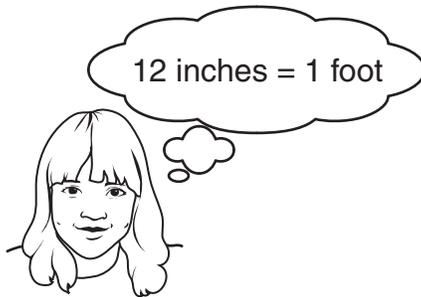


- a. What is the length of this bead to the nearest inch?

2 inches

Part a: The student's response is correct.

Monique wants to put 1 foot 6 inches of her beads on a string.



- b. What is the total number of beads Monique needs?

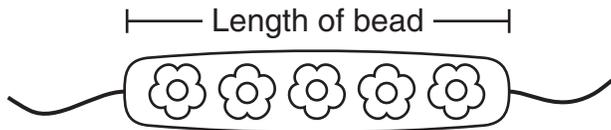
9

Part b: The student's response is correct.

SCORE POINT 1

- 15 Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

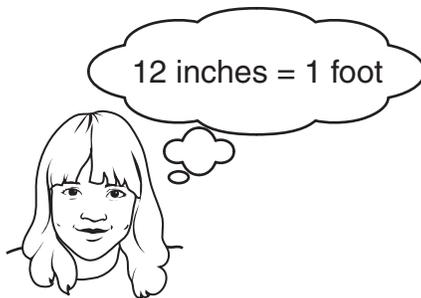


- a. What is the length of this bead to the nearest inch?

2 inches

Part a: The student's response is correct.

Monique wants to put 1 foot 6 inches of her beads on a string.



- b. What is the total number of beads Monique needs?

12 inches + 6 inches = 18 inches
18 inches

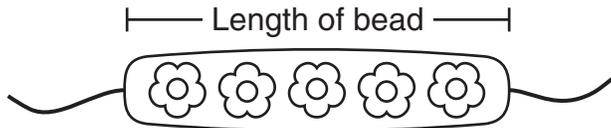
Part b: The student's response is incorrect.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0

- 15 Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

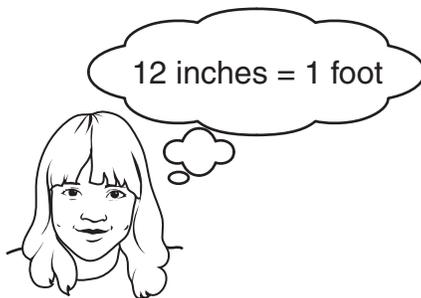


- a. What is the length of this bead to the nearest inch?

$8\frac{1}{8}$ inches

Part a: The student's response is incorrect.

Monique wants to put 1 foot 6 inches of her beads on a string.



- b. What is the total number of beads Monique needs?

she needs 7 more beads.

Part b: The student's response is incorrect.

**NECAP 2012 RELEASED ITEMS
GRADE 4 MATH**

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.

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.
- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	
Tanya	
Walter	
Ava	

**NECAP 2012 RELEASED ITEMS
GRADE 4 MATH**

Scoring Guide:

Score	Description
2	Student correctly completes table, blue, blue, red, red , in any order.
1	Student completes table to meet only one condition.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2

- 16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.
- Red was the most common color.
 - Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	blue
Tanya	Red
Walter	Red
Ava	blue

The student's response is correct.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.
- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	blue
Tanya	blue
Walter	blue
Ava	blue

The student's response meets one condition.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE B)

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.
- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	Blue
Tanya	Red
Walter	Red
Ava	Green

The student's response meets one condition.

NECAP 2012 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.
- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	red
Tanya	red
Walter	green
Ava	green

The student's response is incorrect.

Grade 4 Mathematics Released Item Information – 2012

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

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

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