



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2010**

**Grade 4
Mathematics**

NECAP 2010 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**.



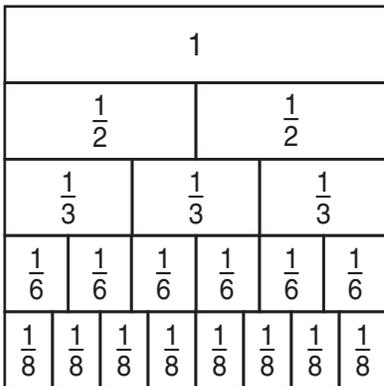
1 What is 5 hundreds + 18 tens + 3 ones?

- A. 583
- B. 683
- C. 5183
- D. 6183

NECAP 2010 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.

- 2 You may use this model to help answer the question.



Which list shows the fractions in order from **least** to **greatest**?

- A. $\frac{1}{3}$, $\frac{5}{6}$, $\frac{2}{8}$
- B. $\frac{2}{8}$, $\frac{1}{3}$, $\frac{5}{6}$
- C. $\frac{1}{3}$, $\frac{2}{8}$, $\frac{5}{6}$
- D. $\frac{2}{8}$, $\frac{5}{6}$, $\frac{1}{3}$

NECAP 2010 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 Mrs. Watson bought three different-sized cups for a snack bar. She bought

- 225 large cups,
- 500 more medium cups than large cups, and
- more small cups than medium cups.

Which could be the number of small cups Mrs. Watson bought?

- A. 275
- B. 450
- C. 725
- D. 850

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 Juliet solved this problem.

$$28 + 16 = 44$$

Which number sentence can Juliet use to check her work?

- A. $28 - 16 = \square$
- B. $28 + 44 = \square$
- C. $44 + 16 = \square$
- D. $44 - 28 = \square$

NECAP 2010 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 Alex bought 4 boxes of pencils. There were 12 pencils in each box. He wrote this number sentence to show how many pencils he bought.

$$12 + 12 + 12 + 12 = \square$$

Which number sentence also shows how many pencils Alex bought?

- A. $12 \div 4 = \square$
- B. $12 - 4 = \square$
- C. $4 + 12 = \square$
- D. $4 \times 12 = \square$

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 Mitch has \$5.15 in his backpack and \$2.30 in his pocket. How much more money does Mitch have in his backpack than in his pocket?

- A. \$2.75
- B. \$2.85
- C. \$3.25
- D. \$3.85

NECAP 2010 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).



- 7 Scott's father is 26 years older than Scott. Scott's grandfather is 35 years older than Scott's father. Scott's grandfather is 72 years old. How old is Scott?
- A. 11 years old
 - B. 13 years old
 - C. 21 years old
 - D. 37 years old

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.

- 8 This clock shows the time music class starts.



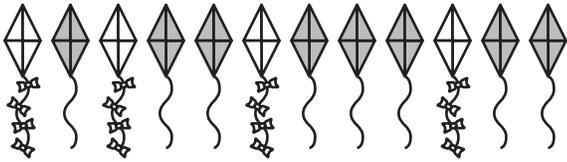
Music class is 40 minutes long. What time will music class end?

- A. 12:30
- B. 11:35
- C. 11:30
- D. 10:50

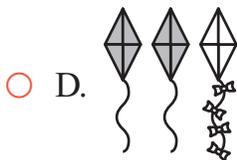
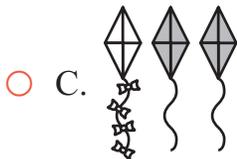
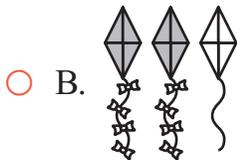
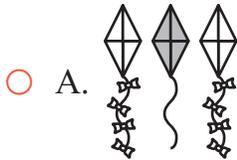
NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

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.

- 9 This pattern of kites is a growing pattern.



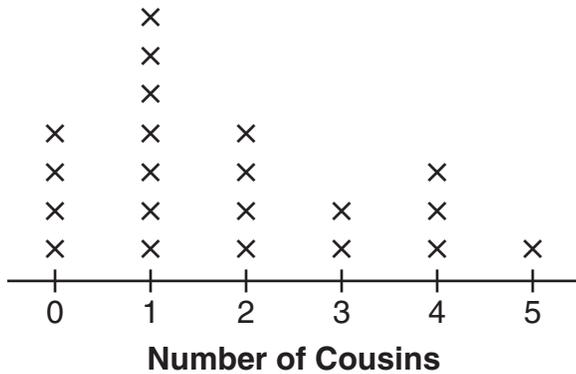
What are the next three kites in this pattern?



NECAP 2010 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.

- 10 This line plot shows the numbers of cousins the students in Mr. Durant's class have.



Key
x represents 1 student

What is the least frequent number of cousins the students in the class have?

- A. 0
- B. 1
- C. 4
- D. 5

NECAP 2010 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**.



11 Madeline used blocks to show the number 52. She used

- 12  and
- some .



How many  did Madeline use?

Scoring Guide

Score	Description
1	for correct answer, 4
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)



11 Madeline used blocks to show the number 52. She used

- 12  and
- some .

Key
 represents 1

How many  did Madeline use?

4

The student's answer is correct.

SCORE POINT 1
(EXAMPLE B)



11 Madeline used blocks to show the number 52. She used

- 12  and
- some .

Key
 represents 1

How many  did Madeline use?

4 ten rods

The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0



11 Madeline used blocks to show the number 52. She used

- 12  and
- some .

Key
 represents 1

How many  did Madeline use?

she use 5 block and two
little blocks,

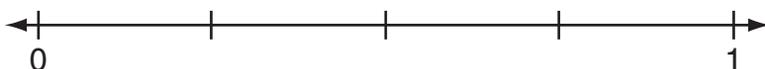
The student's answer is incorrect.

NECAP 2010 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.



- 12 You may use this number line to help you answer this question.



Write a fraction that is equivalent to $\frac{1}{2}$.

Scoring Guide

Score	Description
1	Student writes a fraction that is equivalent to $\frac{1}{2}$.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Responses:

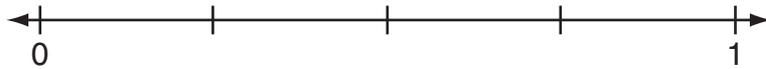
$\frac{2}{4}$ or $\frac{4}{8}$ or $\frac{5}{10}$ or $\frac{3}{6}$

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)



12 You may use this number line to help you answer this question.



Write a fraction that is equivalent to $\frac{1}{2}$.

The student's answer is correct.
An explanation is not required.



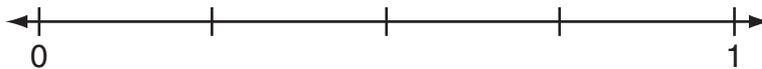
=



SCORE POINT 1
(EXAMPLE B)



12 You may use this number line to help you answer this question.



Write a fraction that is equivalent to $\frac{1}{2}$.



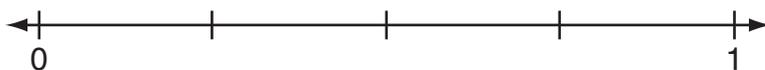
The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0



- 12 You may use this number line to help you answer this question.



Write a fraction that is equivalent to $\frac{1}{2}$.

$\frac{3}{4}$

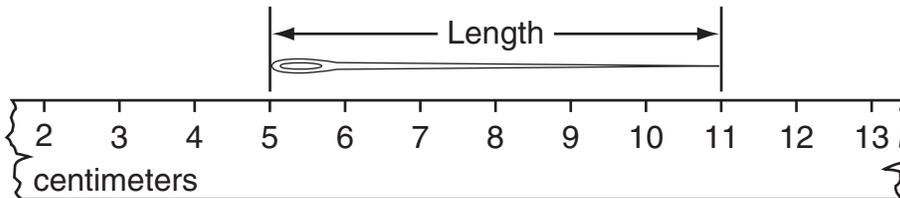
The student's answer is incorrect.

NECAP 2010 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.



13 Look at this needle.



What is the length of this needle to the nearest centimeter?

_____ centimeters

Scoring Guide

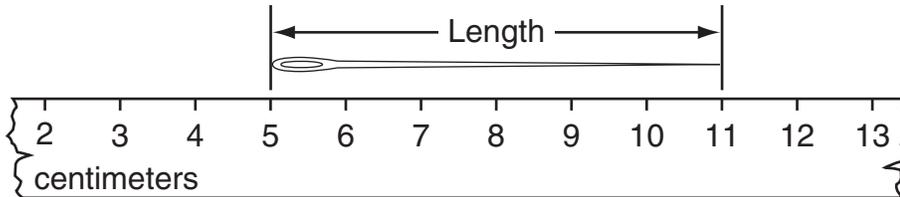
Score	Description
1	for correct answer, 6
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)



13 Look at this needle.



What is the length of this needle to the nearest centimeter?

6 centimeters

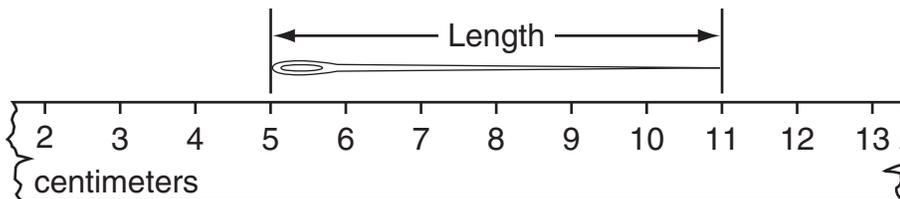
The student's answer is correct. An explanation is not required.

I counted between 5 and 11.

SCORE POINT 1
(EXAMPLE B)



13 Look at this needle.



What is the length of this needle to the nearest centimeter?

6 centimeters

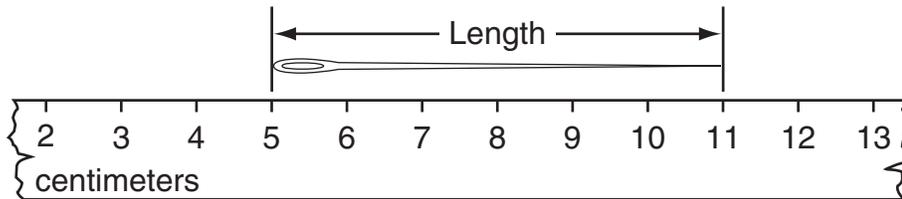
The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0
(EXAMPLE A)



13 Look at this needle.



What is the length of this needle to the nearest centimeter?

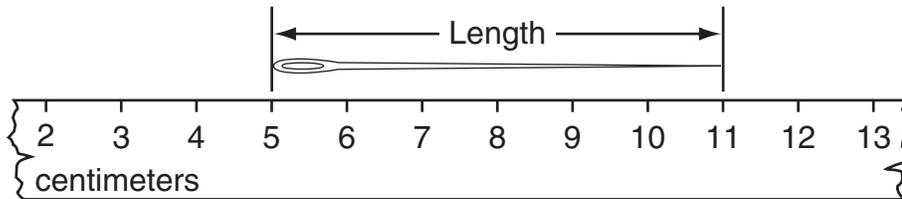
7 centimeters

The student's answer is incorrect.

SCORE POINT 0
(EXAMPLE B)



13 Look at this needle.



What is the length of this needle to the nearest centimeter?

11 centimeters

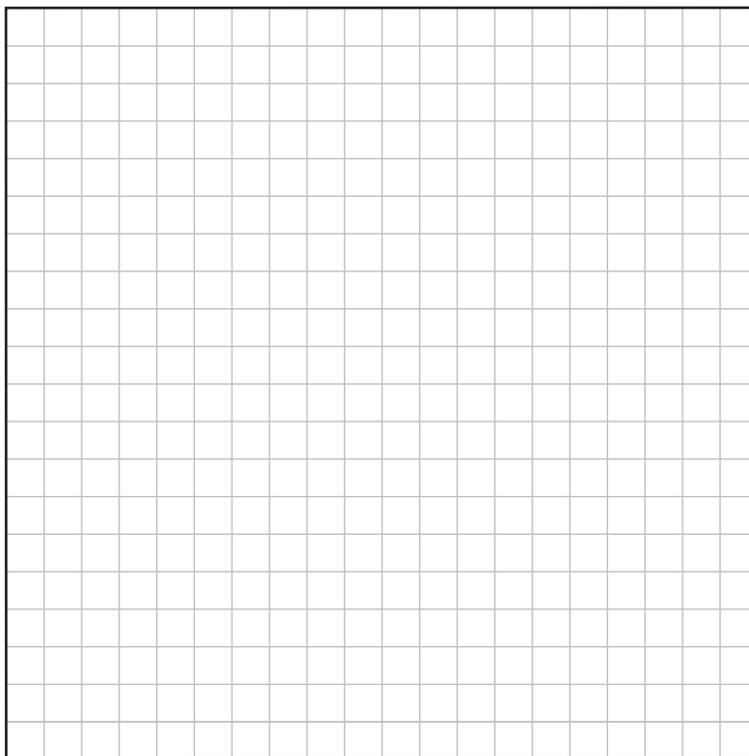
The student's answer is incorrect.

NECAP 2010 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.

14 a. Explain one way that squares and rectangles are **alike**.

b. On the grid below, draw a rectangle that is not a square.



**NECAP 2010 RELEASED ITEMS
GRADE 4 MATH**

Scoring Guide

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

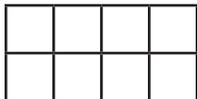
Sample Responses:

Part a: Accept any correct answer. Some examples are:
 They both have 4 right angles.

OR

 They both have 4 sides.

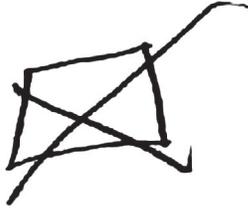
Part b: Accept any drawing of a rectangle that does not have 4 equilateral sides. An example is:



NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE A)

- 14 a. Explain one way that squares and rectangles are alike.



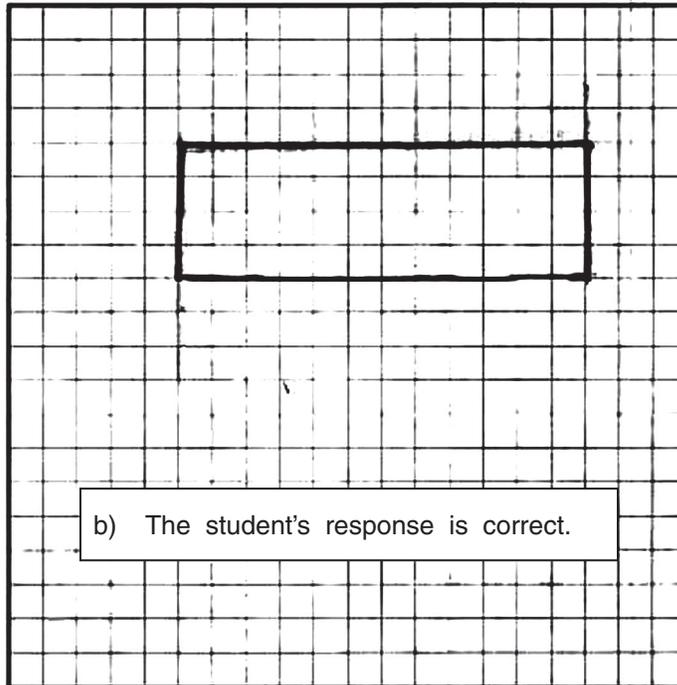
Square

rectangles

a) The student's response is correct.

Squares and rectangles
are alike they're alike
by having the same amount
of angles and they have
two pairs of parallel sides.

- b. On the grid below, draw a rectangle that is not a square.

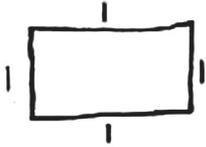


b) The student's response is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE B)

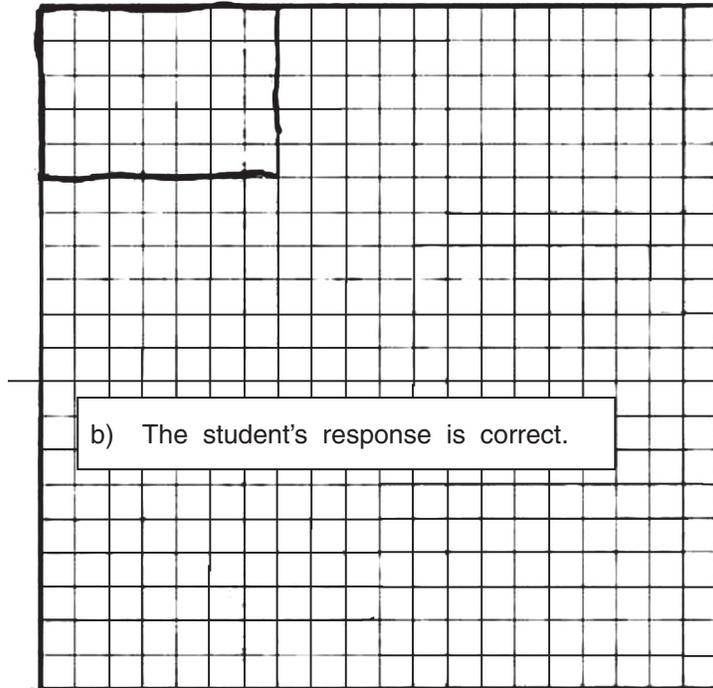
- 14 a. Explain one way that squares and rectangles are **alike**.



They have 4 sides.

a) The student's response is correct.

- b. On the grid below, draw a rectangle that is not a square.



b) The student's response is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

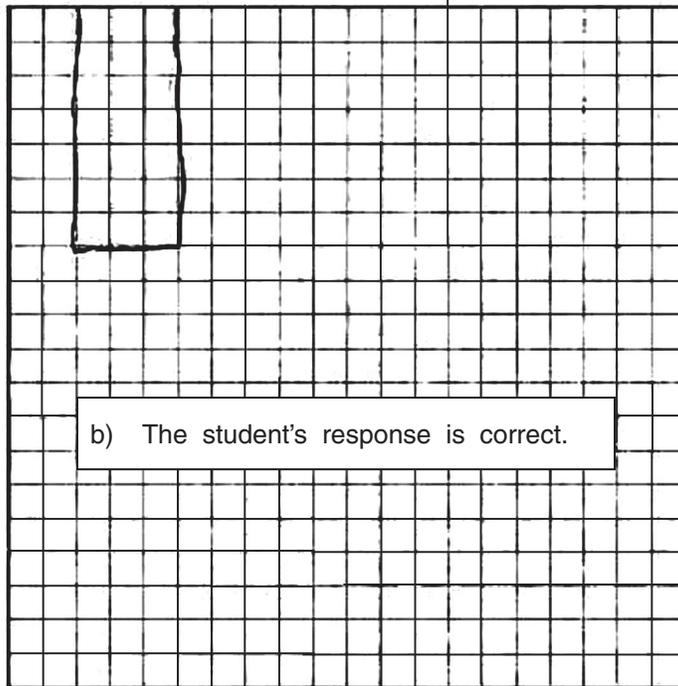
SCORE POINT 2
(EXAMPLE C)

- 14 a. Explain one way that squares and rectangles are **alike**.

they both have 4 right angles

a) The student's response is correct.

- b. On the grid below, draw a rectangle that is not a square.



b) The student's response is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

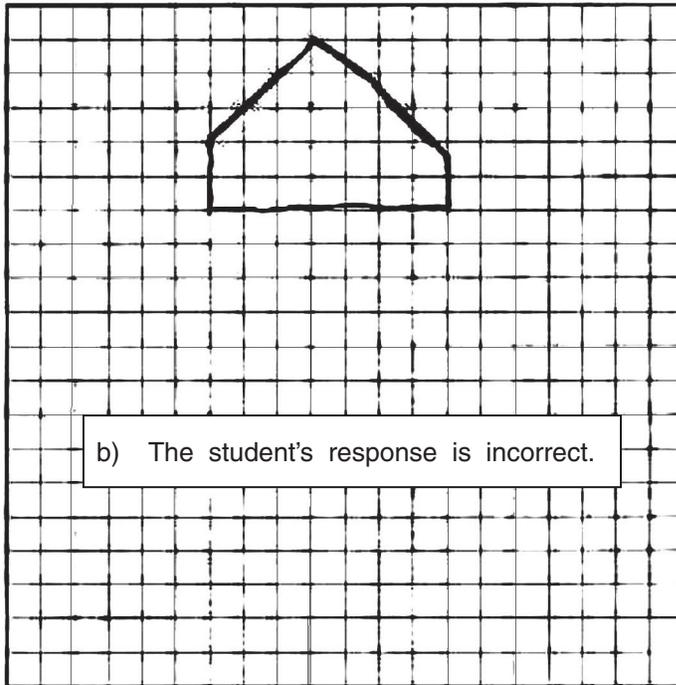
SCORE POINT 1
(EXAMPLE A)

- 14 a. Explain one way that squares and rectangles are **alike**.

 and  are alike
because they both have four sides!  =

a) The student's response is correct.

- b. On the grid below, draw a rectangle that is not a square.



b) The student's response is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

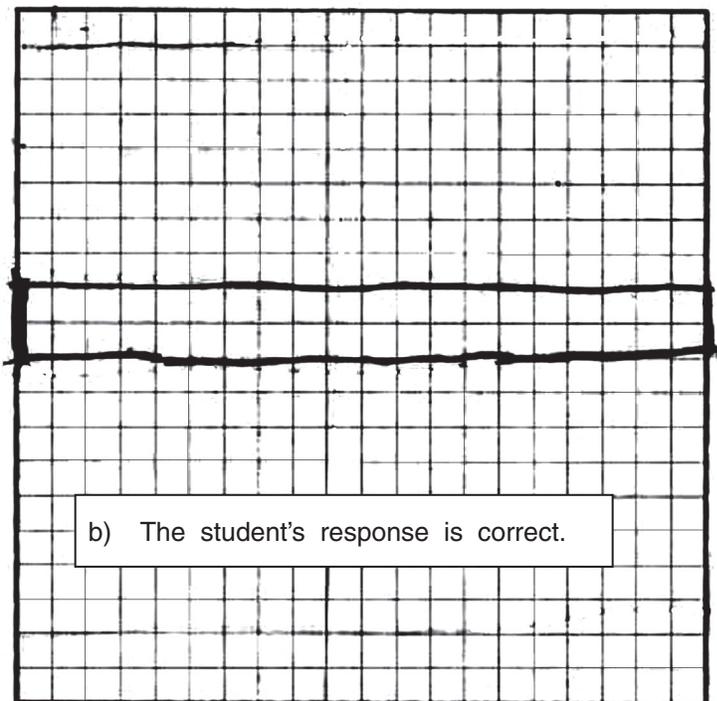
SCORE POINT 1
(EXAMPLE B)

- 14 a. Explain one way that squares and rectangles are **alike**.

They both have 4 faces.

a) The student's response is incorrect.

- b. On the grid below, draw a rectangle that is not a square.



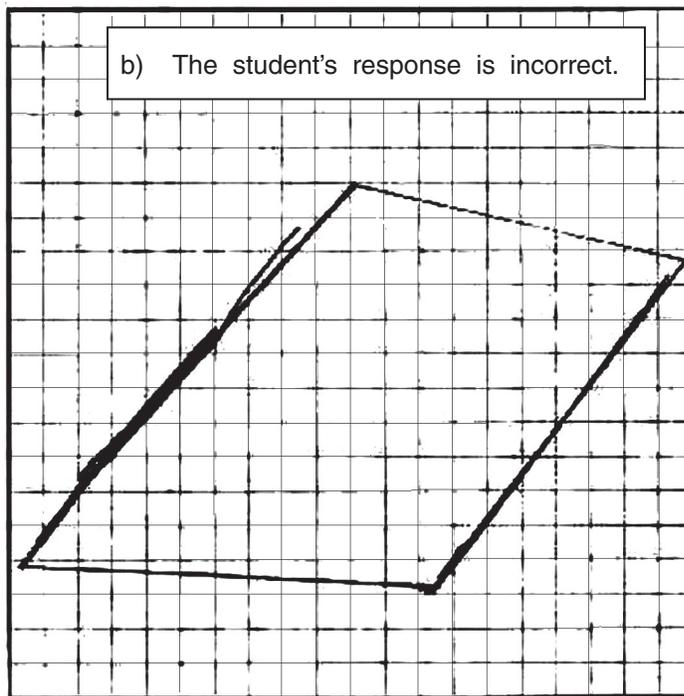
b) The student's response is correct.

- 14 a. Explain one way that squares and rectangles are **alike**.

Two squares equal
one rectangle

a) The student's response is incorrect.

- b. On the grid below, draw a rectangle that is not a square.



NECAP 2010 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)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[erased]} + 15$$

- a. What number did Elke erase?

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[erased]} + 4 + \text{[erased]} = 6 + 4$$

- b. What number did Anna erase?

Scoring Guide

Score	Description
2	Student has correct answer in part a, 5, and part b, 3.
1	Student has correct answer in part a. OR Student has 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

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE A)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[erased]} + 15$$

- a. What number did Elke erase?

a) The student's answer is correct.

5

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[erased]} + 4 + \text{[erased]} = 6 + 4$$

- b. What number did Anna erase?

b) The student's answer is correct.

3, 3

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE B)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[blacked out]} + 15$$

- a. What number did Elke erase?

Elke erased 5.

a) The student's answer is correct.

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[blacked out]} + 4 + \text{[blacked out]} = 6 + 4$$

- b. What number did Anna erase?

Anna erased number 3.

b) The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE A)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[blacked out]} + 15$$

- a. What number did Elke erase?

a) The student's answer is incorrect.

Elke erased the number 35 from the number sentence.

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[blacked out]} + 4 + \text{[blacked out]} = 6 + 4$$

- b. What number did Anna erase?

Anna erased two 3's from this number sentence.

b) The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 1
(EXAMPLE B)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[erased]} + 15$$

- a. What number did Elke erase?

5

a) The student's answer is correct.

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[erased]} + 4 + \text{[erased]} = 6 + 4$$

- b. What number did Anna erase?

6

b) The student's answer is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0
(EXAMPLE A)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[blacked out]} + 15$$

- a. What number did Elke erase?

20

a) The student's answer is incorrect.

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[blacked out]} + 4 + \text{[blacked out]} = 6 + 4$$

- b. What number did Anna erase?

1 and 1

b) The student's answer is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 0
(EXAMPLE B)

- 15 Elke erased a number from this true number sentence.

$$11 + 9 = \text{[blacked out]} + 15$$

- a. What number did Elke erase?

$$11 + 9 = 20 + 15 = 35$$

a) The student's answer is incorrect.

Anna erased two numbers from this true number sentence. The two numbers Anna erased are the same.

$$\text{[blacked out]} + 4 + \text{[blacked out]} = 6 + 4$$

- b. What number did Anna erase?

$$1 + 4 + 1 = 6 + 4 = 10$$

b) The student's answer is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

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.



- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

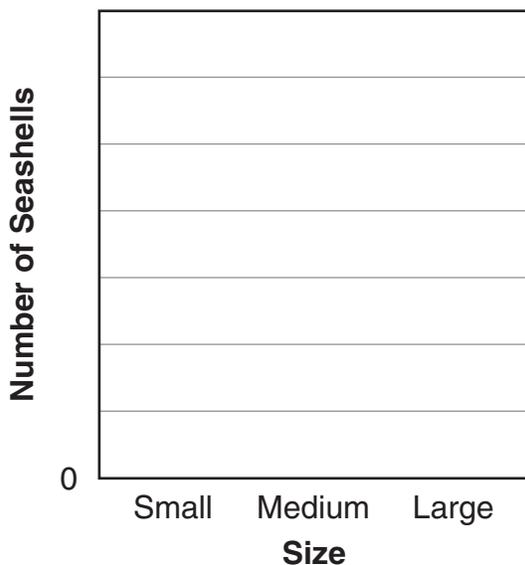
Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- Complete the scale on the bar graph.
- Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.

Seashell Collection



**NECAP 2010 RELEASED ITEMS
GRADE 4 MATH**

Scoring Guide

Score	Description
2	Student completes bar graph with correct scale and bars.
1	Student completes bar graph with correct scale. or Student completes bar graph with no scale, but with correct bars based on consistent intervals.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE A)



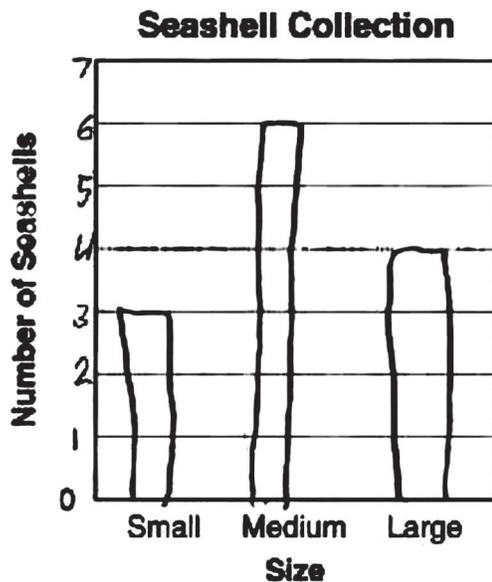
- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- Complete the scale on the bar graph.
- Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.



The student's response is correct.

NECAP 2010 RELEASED ITEMS
GRADE 4 MATH

SCORE POINT 2
(EXAMPLE B)



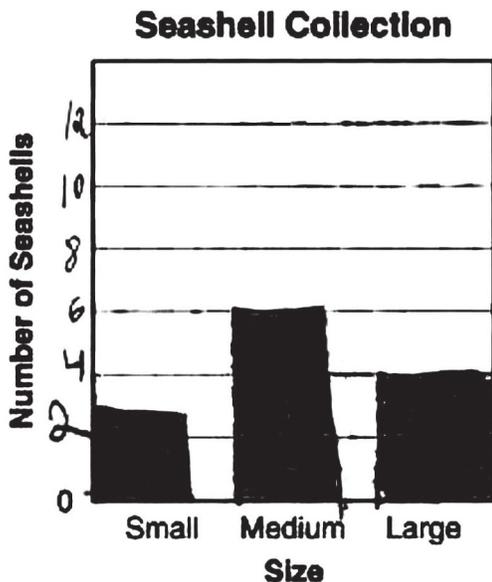
- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- Complete the scale on the bar graph.
- Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.



The student's response is correct.

SCORE POINT 1
(EXAMPLE A)



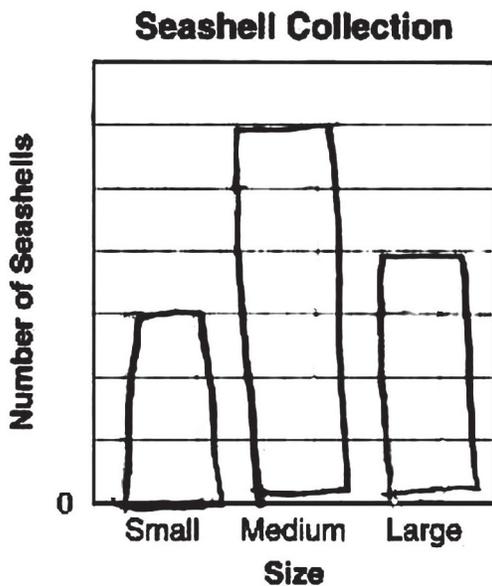
- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- Complete the scale on the bar graph.
- Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.



The student's graph does not include a scale.

SCORE POINT 1
(EXAMPLE B)



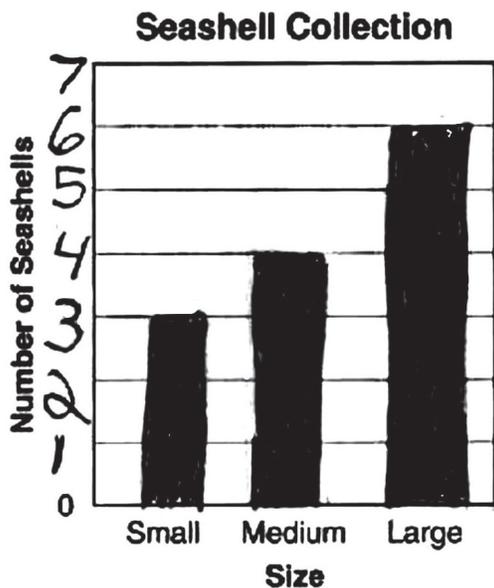
- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- a. Complete the scale on the bar graph.
- b. Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.



The student reverses the lengths of the bars for medium and large.



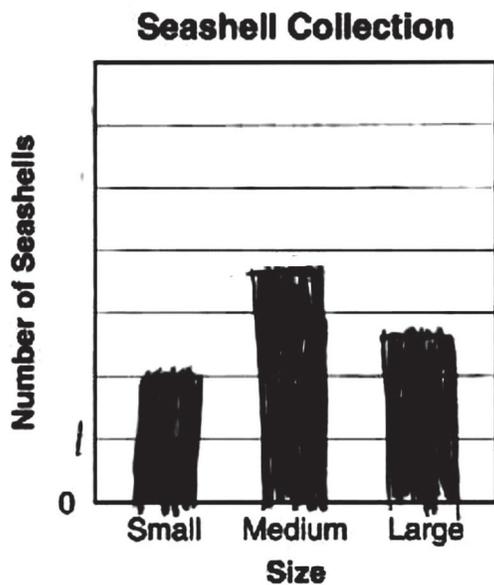
- 16 Haley made this table to show the number of different-sized seashells she has in her collection.

Seashell Collection

Size	Number of Seashells
Small	3
Medium	6
Large	4

Use the information from the table to complete the bar graph below.

- Complete the scale on the bar graph.
- Draw bars on the graph to show each number of small, medium, and large seashells Haley has in her collection.



The student's graph does not include a scale, and the relative lengths of the bars are incorrect.

Grade 4 Mathematics Released Item Information - 2010

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