



**NEW ENGLAND
COMMON ASSESSMENT PROGRAM**

**Released Items
Support Materials
2010**

**Grade 5
Mathematics**

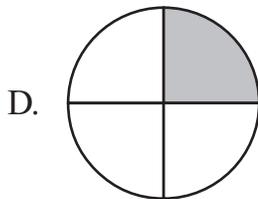
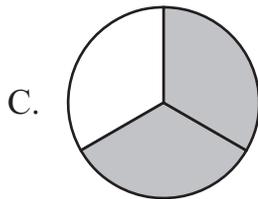
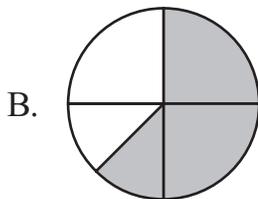
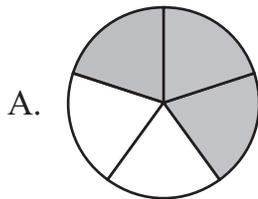
NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

N&O 4.1 Demonstrates conceptual understanding of rational numbers with respect to: whole numbers from 0 to 999,999 through equivalency, composition, decomposition, or place value using models, explanations, or other representations; and positive fractional numbers (benchmark fractions: $\frac{a}{2}$, $\frac{a}{3}$, $\frac{a}{4}$, $\frac{a}{5}$, $\frac{a}{6}$, $\frac{a}{8}$, or $\frac{a}{10}$, 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, set, or linear models where the number of parts in the whole are equal to, and a multiple or factor of the denominator; and decimals as hundredths within the context of money, or tenths within the context of metric measurements (e.g., 2.3 cm) using models, explanations, or other representations.

1 Look at this set of apples.



Some of the apples in this set were eaten. Which circle is shaded gray to represent the fraction of the set of apples that was eaten?



NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

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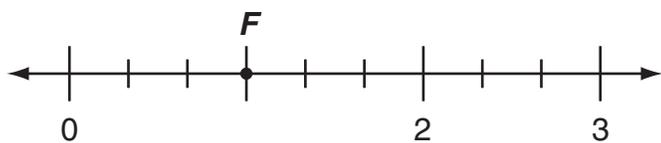


- 2 Which digit of this number will change when ten thousand is added to 24,150?
- A. 2
 - B. 4
 - C. 1
 - D. 5

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

N&O 4.2 Demonstrates understanding of the relative magnitude of numbers from 0 to 999,999 by ordering or comparing whole numbers; and ordering, comparing, or identifying equivalent proper positive fractional numbers; or decimals using models, number lines, or explanations.

3 Look at this number line.



What number is shown by point *F*?

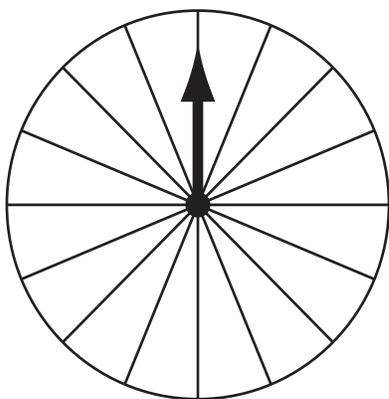
- A. $\frac{1}{3}$
- B. $\frac{2}{3}$
- C. $\frac{3}{3}$
- D. $\frac{4}{3}$

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

N&O 4.2 Demonstrates understanding of the relative magnitude of numbers from 0 to 999,999 by ordering or comparing whole numbers; and ordering, comparing, or identifying equivalent proper positive fractional numbers; or decimals using models, number lines, or explanations.



- 4 Jeremiah has a spinner that is divided into 16 equal sections, as shown below.



Jeremiah will color the sections of the spinner using the fractions listed below.

- $\frac{4}{16}$ red
- $\frac{1}{8}$ blue
- $\frac{3}{8}$ green
- $\frac{1}{4}$ yellow

Which color will take up the greatest amount of space on the spinner?

- A. red
- B. blue
- C. green
- D. yellow

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

N&O 4.3 **Demonstrates conceptual understanding of mathematical operations** by describing or illustrating the relationship between repeated subtraction and division (no remainders); the inverse relationship between multiplication and division of whole numbers; or the addition or subtraction of positive fractional numbers with like denominators using models, number lines, or explanations.



- 5 Look at this number sentence.

$$3 \times \star = 195$$

Each \star represents the same number.
Which number sentence is true?

- A. $195 - \star = 3$
- B. $195 \times 3 = \star$
- C. $195 - 3 - 3 - 3 = \star$
- D. $195 - \star - \star - \star = 0$

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

N&O 4.4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.)

- 6 You may use this calendar to help you answer this question.

April						
Sun.	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.
	1	2	3	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				

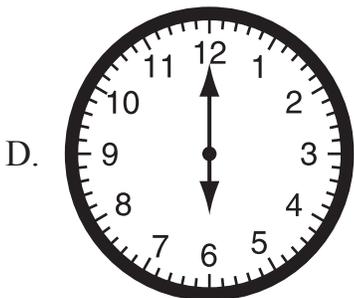
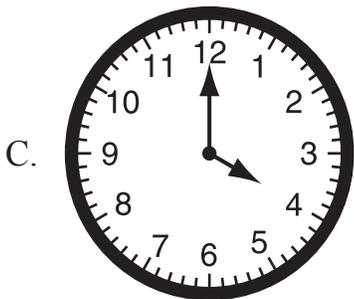
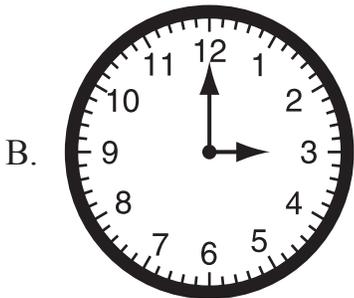
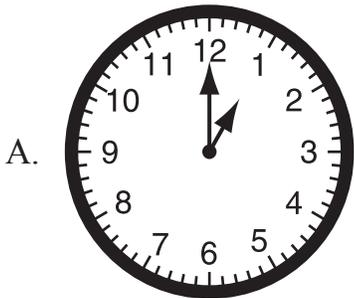
On April 1, Molly had a guitar lesson and a piano lesson. She has a guitar lesson every 8 days and a piano lesson every 12 days. What is the next date that Molly will have **both** a guitar lesson and a piano lesson?

- A. April 13
- B. April 17
- C. April 21
- D. April 25

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

G&M 4.1 Uses properties or attributes of angles (number of angles) or sides (number of sides, length of sides, parallelism, or perpendicularity) to identify, describe, or distinguish among triangles, squares, rectangles, rhombi, trapezoids, hexagons, or octagons; or classify angles relative to 90° as more than, less than, or equal to.

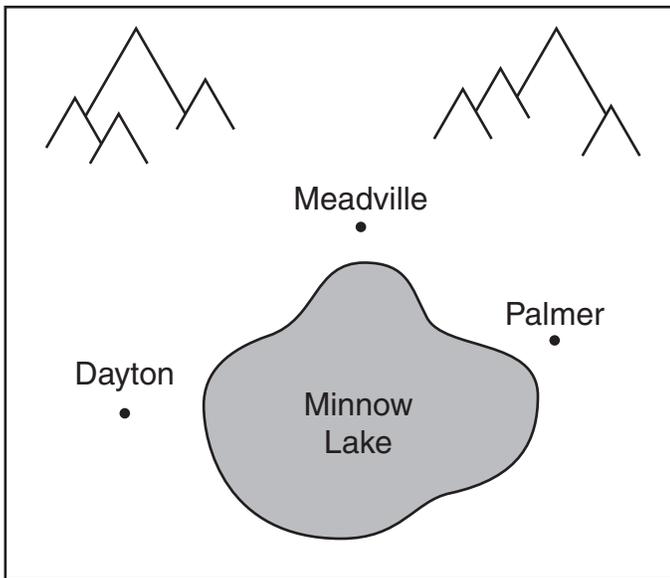
- 7 In which clock is the angle between the hour hand and the minute hand less than 90° ?



NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

G&M 4.5 Demonstrates conceptual understanding of similarity by applying scales on maps, or applying characteristics of similar figures (same shape but not necessarily the same size) to identify similar figures, or to solve problems involving similar figures. Describes relationships using models or explanations.

- 8 Use your ruler and the map below to answer this question.



Scale

1 centimeter represents 6 kilometers

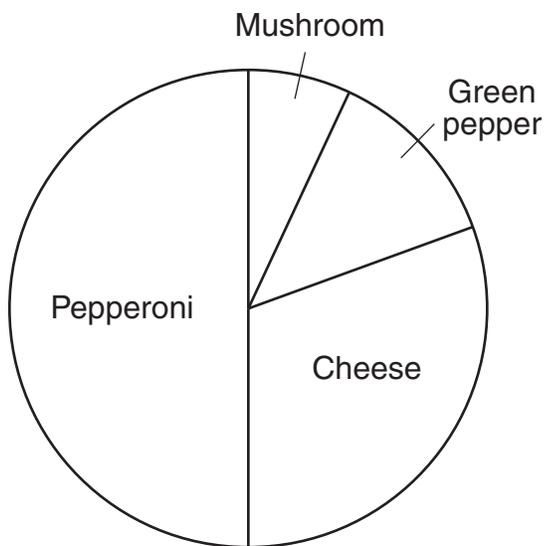
The McMillans biked from Dayton to Palmer by going through Meadville. What is the least number of kilometers the McMillans could have biked?

- A. 7 kilometers
- B. 13 kilometers
- C. 33 kilometers
- D. 42 kilometers

DSP 4.1 **Interprets a given representation** (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems. (IMPORTANT: *Analyzes data consistent with concepts and skills in M(DSP)–4–2.*)

- 9 This graph shows the favorite pizza toppings of students in Kayla’s class. Each student chose one topping.

Favorite Pizza Toppings



Which statement is true based on the data in the graph?

- A. The most students chose cheese as their favorite topping.
- B. The fewest students chose mushroom as their favorite topping.
- C. More than half the students chose cheese as their favorite topping.
- D. More than half the students chose either mushroom or green pepper as their favorite topping.

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

DSP 4.4 Uses counting techniques to solve problems in context involving combinations or simple permutations (e.g., Given a map – Determine the number of paths from point A to point B.) using a variety of strategies (e.g., organized lists, tables, tree diagrams, or others).

- 10 Chester's dad let him choose what to have for dinner. This table shows the drinks, main dishes, and desserts that Chester could choose.

Dinner Choices

Drink	Main Dish	Dessert
Milk	Pizza	Cake
Juice	Chicken	Pie
	Pasta	

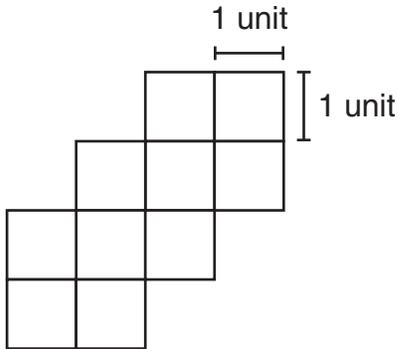
How many different ways could Chester choose one drink, one main dish, and one dessert?

- A. 7
- B. 9
- C. 10
- D. 12

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

G&M 4.6 Demonstrates conceptual understanding of perimeter of polygons, and the area of rectangles, polygons or irregular shapes on grids using a variety of models, manipulatives, or formulas. Expresses all measures using appropriate units.

- 11 The figure below is made of squares that are all the same size.



What is the perimeter of the figure?

Scoring Guide:

Score	Description
1	for correct answer, 16 (units)
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 5 MATH

SCORE POINT 1
(EXAMPLE A)

11

16

The student's answer is correct.

SCORE POINT 1
(EXAMPLE B)

11



The perimeter of this shape is 16 units

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

SCORE POINT 0

11



I think its 18
because there are 18
sides.

The student's response is incorrect.

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

DSP 4.2 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (median or mode), or range.

- 12 The table below shows the ages of Selene's cousins.

Ages of Selene's Cousins

Name	Age (in years)
Scott	8
Tabitha	3
David	7
Nadia	3
Craig	15
Stephen	2
Candace	5

What is the median age of Selene's cousins?

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 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 1
(EXAMPLE A)

12

five

The student's answer is correct.

SCORE POINT 1
(EXAMPLE B)

12

~~2, 4, 8, 5, 7, 8, 15~~

5 is the median age of Jelene's cousins.

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

SCORE POINT 0

12

8, 3, 7, ③, 15, 2, 5

The student's response is incorrect.

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

N&O 4.4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.)



- 13** A package of 3 tubes of toothpaste costs \$3.49. The cost of a single tube of toothpaste is \$1.25. How much more will it cost to buy 3 single tubes of toothpaste than to buy a package of 3 tubes of toothpaste? Show your work or explain how you know.

Scoring Guide:

Score	Description
2	for correct answer, (\$0.26 , 26¢ , or 26 cents), with sufficient explanation or work shown to indicate correct strategy
1	for correct answer with insufficient or no explanation or work shown or for sufficient strategy with incorrect or no answer
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Sample Response:

It cost $1.25 + 1.25 + 1.25 = \$3.75$ to buy three single tubes, so it will cost $3.75 - 3.49 = \$0.26$ more.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 2
(EXAMPLE A)



13

$$\begin{array}{r} \$1.25 \\ \$1.25 \\ \$1.25 \\ \hline 3.75 \end{array} \quad \begin{array}{r} \$3.75 \\ - \$3.49 \\ \hline \$0.26 \end{array}$$

It is 26¢ or \$0.26 more if you buy the singles.

The student's answer is correct, with sufficient work shown.

SCORE POINT 2
(EXAMPLE B)



13

$$\begin{array}{r} 1.25 \\ \times 3 \\ \hline 3.75 \end{array} \quad \begin{array}{r} 3.75 \\ - 3.49 \\ \hline 0.26 \end{array} \quad 26\text{¢ more}$$

The student's answer is correct, with sufficient work shown.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 1
(EXAMPLE A)



13

It will cost 25¢ more to buy 3 tubes.

The student's answer is correct, with no explanation or work shown.

SCORE POINT 1
(EXAMPLE B)



13

Toothpaste: $\boxed{46¢}$

3 single tubes	package	
\$1.25	\$3.49	\$3.015
\$1.25		- 3.49
\$1.25		<hr/>
<u>\$3.95</u>		\$0.46

The student's strategy is appropriate, with an incorrect answer due to an arithmetic error.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 0
(EXAMPLE A)



13

I + will cost \$4.74

The student's response is incorrect.

SCORE POINT 0
(EXAMPLE B)



13

\$3.49 package 3 toobs
- \$1.25 1 single toob

\$2.24

The student's response is incorrect.

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

G&M 4.3 Uses properties or attributes (shape of bases or number of lateral faces) to **identify, compare, or describe three-dimensional shapes** (rectangular prisms, triangular prisms, cylinders, or spheres).

- 14 a. Use mathematical language to describe one way that a cylinder and a rectangular prism are **alike**.
- b. Use mathematical language to describe one way that a cylinder and a rectangular prism are **different**. Use the term “base” in your response.

Scoring Guide:

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

Training Notes:

- There are many acceptable answers to part a.
- Make sure that students use mathematical language in their answers to both parts.

Sample Responses:

Part a: Both shapes have 2 bases.

OR

Both shapes are 3-dimensional.

OR

The nets of both shapes contain rectangles.

Part b: A cylinder has circular bases and a rectangular prism has rectangular (or square) bases.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 2
(EXAMPLE A)

14

A. They are both 3-D.

The student's response to each part is correct.

B. The base of a cylinder is a circle and the base of a rectangular prism is a rectangle.

SCORE POINT 2
(EXAMPLE B)

14

a) They have volume
b) The base of the cylinder is circular
The base of the rectangular prism is rectangular

The student's response to each part is correct.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 1
(EXAMPLE A)

14

Cylinder



rectangular prism



a cylinder and a rectangular prism
are both 3 dimensional.

The student's response to part a is correct. The student did not attempt part b.

SCORE POINT 1
(EXAMPLE B)

14

One way that a cylinder and a rectangular prism are alike is they have two bases.

One way that a cylinder and a rectangular prism are different is a cylinder is round like a sphere and the rectangular prism is rectangular

The student's response to part a is correct. The student did not address the bases in part b.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 0
(EXAMPLE A)

14

A. A cylinder and rectangular prism are alike by both of them have parallel lines.

B. A cylinder and rectangular prism are different because a cylinder has no faces and rectangular has faces.

The student's response to each part is incorrect.

SCORE POINT 0
(EXAMPLE B)

14

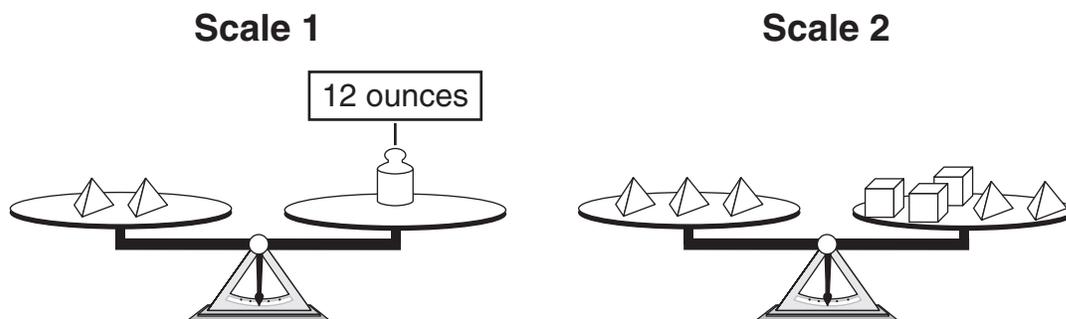
A. They both have four equivalent sides
B. One called a Cylinder the other is called Rectangle.

The student's response to each part is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

F&A 4.4 Demonstrates conceptual understanding of equality by showing equivalence between two expressions using models or different representations of the expressions, by simplifying numerical expressions where left to right computations may be modified only by the use of parentheses [e.g., $14 - (2 \times 5)$] (expressions consistent with the parameters of M(F&A)–4–3), and by solving one-step linear equations of the form $ax = c$, $x \pm b = c$, where a , b , and c are whole numbers with $a \neq 0$.

- 15 The scales shown below are balanced.



Each  has the same weight.

Each  has the same weight.

- a. What is the weight, in ounces, of one ?
- b. What is the weight, in ounces, of one ? Show your work or explain how you know.
- c. Kevin will use some of these  **and**  to balance a 24-ounce weight. Based on your answers from part a and part b, what combination of  and  can he use to balance 24 ounces? Be sure to label your answer with  and .

**NECAP 2010 RELEASED ITEMS
GRADE 5 MATH**

Scoring Guide:

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a: 1 point for correct answer, **6** (ounces)

Part b: 2 points for correct answer, **2** (ounces), or correct answer based on student's response to part a, with sufficient explanation or work shown to indicate correct strategy

OR

1 point for correct answer with insufficient or no explanation or work shown
or

for sufficient strategy with incorrect or no answer

Part c: 1 point for correct answer

or

for correct answer based on student's response to part a and/or part b

Note: Student must include at least one of each shape to receive credit in part c.

Sample Responses:

Part b: 2

$$1 \text{ pyramid} = 6$$

$$6 \times 3 \text{ pyramids} = 18$$

$$18 = 3 \text{ squares} + 12$$

$$6 = 3 \text{ squares}$$

$$6 \div 3 = 2$$

So, each square must weigh 2.

Part c: Possible answers:

- 1 pyramid and 9 cubes
- 2 pyramids and 6 cubes
- 3 pyramids and 3 cubes

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

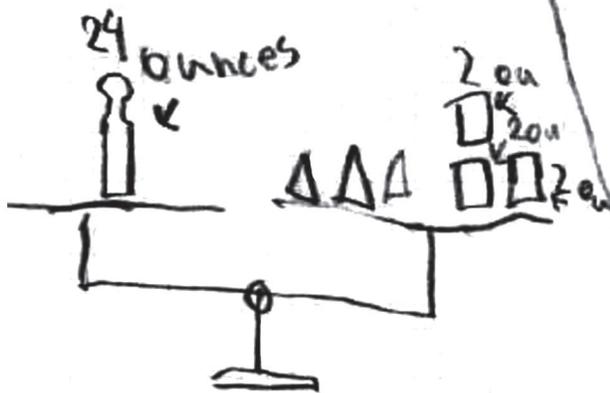
SCORE POINT 4
(EXAMPLE A)

15

a. 6 ounces

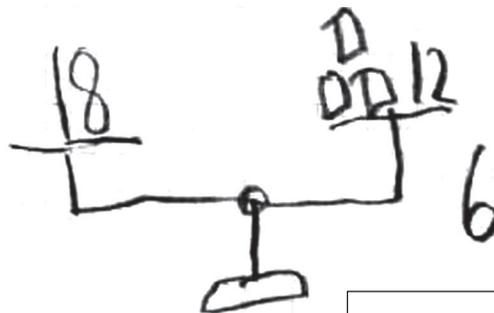
a.) The student's answer is correct.

c.



24 ounce

b.



b.) The student's answer is correct, with sufficient work shown.

$$6 \div 3 = 2$$

$$\square = 2 \text{ ounces}$$

3 Δ triangles Δ
3 \square squares \square

c.) The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 4
(EXAMPLE B)

15

A. $\Delta = 6$ ounces
B. $\square = 2$ ounces

a.) The student's answer is correct.

b.) The student's answer is correct, with sufficient work shown.

because $3 \Delta = 18$ and
 $2 \Delta = 12$ so $6 \div 3 = 2$ (2)

C. Kevin could use 3 Δ and 3 \square

c.) The student's answer is correct.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 3
(EXAMPLE A)

15

(A) $\triangle = 6 \text{ ounces}$

(B) $\square = 2 \text{ ounces}$

a.) The student's answer is correct.

b.) The student's answer is correct, with sufficient work shown.

if $\triangle = 6 \text{ ounces}$ and on scale $2 \times 3 \triangle$'s would be equal to 18. on the other side there where 2 \triangle 's there already so there where 3 boxes (\square) because if they are each worth 2 then the amount of ounces is equal.

(C)

6- \triangle 4- \square

c.) The student's answer is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 3
(EXAMPLE B)

15

a.) The student's answer is correct.

b.) The student's answer is correct, with no explanation or work shown.

A. 6 ounces

B. 2 ounces

C. 2 of these \triangle and 6 of these \square

c.) The student's answer is correct.

SCORE POINT 2

15

a.) The student's answer is correct.

a. The weight of \triangle in ounces is 6 ounces.

b. The weight of \square in ounces is 2 ounces.

b.) The student's answer is correct, with no explanation or work shown.

c.

You would need 4 \triangle on one side and 3 \triangle and 2 \square on the other side.



c.) The student's answer is incorrect.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

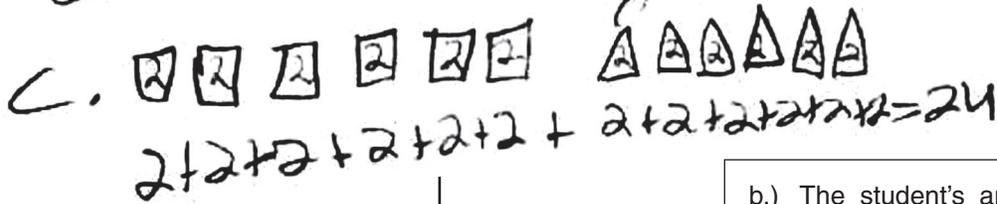
SCORE POINT 1
(EXAMPLE A)

15

a. 2 ounces

a.) The student's answer is incorrect.

b. 2 ounces because on scale two if all of them were two ounces it would weigh 16 ounces and scale one would weigh 16 ounces

c. 
 $2+2+2+2+2+2 + 2+2+2+2+2+2 = 24$

b.) The student's answer is incorrect based on the answer to part a, with incorrect strategy.

c.) The student's answer is correct based on the answers to parts a and b.

NECAP 2010 RELEASED ITEMS
GRADE 5 MATH

SCORE POINT 1
(EXAMPLE B)

15

A) 6, ounces

a.) The student's answer is correct.

B) 6, ounces

b.) The student's answer is incorrect, with no explanation or work shown.

C) $\triangle \triangle \triangle \triangle = 24$

c.) The student did not include both shapes.

SCORE POINT 0

15

a. 3 ounces

a.) The student's answer is incorrect.

b. 3 ounces

b.) The student's answer is incorrect, with no explanation or work shown.

c. 2 of \triangle and 2 of the \square

c.) The student's answer is incorrect.

Grade 5 Mathematics Released Item Information - 2010

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

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

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