



NEVADA INSTRUCTIONAL MATERIALS

FOR THE
NEVADA ACADEMIC CONTENT STANDARDS FOR MATHEMATICS

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Grade 5

TEACHER EDITION



Scoring Support Materials

Grade 5 Mathematics

DALE A.R. ERQUIAGA
Superintendent of Public Instruction

STATE OF NEVADA



TEACHER LICENSURE
SOUTHERN NEVADA OFFICE
9890 S. Maryland Parkway, Suite 221
Las Vegas, Nevada 89183
(702) 486-6458
Fax: (702)486-6450
<http://teachers.nv.gov>

JULIA TESKA
Deputy Superintendent
Business and Support Services

DEPARTMENT OF EDUCATION
700 E. Fifth Street
Carson City, Nevada 89701-5096
(775) 687 - 9200 • Fax: (775) 687 – 9101
<http://www.doe.nv.gov>

Introduction

This document represents the Phase III release of Nevada Instructional Materials. These released materials were developed in collaboration with Nevada educators, the Nevada Department of Education, and WestEd (a nonprofit research development and service agency).

These materials are intended for use in various guided instructional activities to support deep understanding of the Nevada Academic Content Standards (NVACS) for English Language Arts and mathematics based on Common Core. The Nevada Instructional Materials provide educators opportunities to investigate and explore the standards and tasks that are aligned to the standards. The Nevada educators involved in the development of these materials also developed “Teacher Tips” to assist in using these materials as an instructional resource. The Nevada Instructional Materials also provide educators opportunities to investigate and explore the standards and tasks that are aligned to the standards.

While these materials can provide students with practice in responding to a variety of assessment items, it is more important that they are used to help students deepen their understanding of the expectations embedded in the standards. If these instructional materials are used solely as an assessment practice activity, we highly recommend that educators go over each item with their students and evaluate each answer choice so that students can better understand the knowledge required to successfully complete each task.

Through rich classroom discussion around each item and the various answer choices or potential responses, educators can actively engage students in critical thinking, reasoning, and application of knowledge and skills, helping to ensure all students are ready for success in the 21st century.



Item Level Data

Item Number	NVACS*	DOK	Answers
1	5.OA.A1	1	A, D
2	5.OA.A2	1	-----
3	5.OA.A2	1	C
4	5.OA.B3	2	C, E
5	5.OA.B3	2	-----
6	5.OA.B3	3	-----
7	5.NBT.A1	1	B, C
8	5.NBT.A2	1	D
9	5.NBT.A3a	1	C
10	5.NBT.A3b	1	-----
11	5.NBT.A4	1	B
12	5.NBT.B5	1	-----
13	5.NBT.B6	2	A, C
14	5.NBT.B6	2	-----
15	5.NBT.B7	2	-----
16	5.NBT.B7	3	-----
17	5.NF.A1	1	D
18	5.NF.B3	2	-----
19	5.NF.A2	2	-----
20	5.NF.A2	2	-----
21	5.NF.B3	3	-----
22	5.NF.B4b	1	A
23	5.NF.B5a	1	B

Item Number	NVACS*	DOK	Answers
24	5.NF.B5b	2	-----
25	5.NF.B6	1	-----
26	5.NF.B7a	1	-----
27	5.NF.B7b	1	-----
28	5.NF.B7c	1	D, F
29	5.MD.A1	2	D
30	5.MD.A1	2	B, C, E
31	5.MD.B2	2	-----
32	5.MD.B2	2	-----
33	5.MD.C4	1	C
34	5.MD.C4	1	B, E, F
35	5.MD.C5a	1	-----
36	5.MD.C5b	1	-----
37	5.MD.C5b	2	-----
38	5.MD.C5c	2	-----
39	5.MD.C5c	3	-----
40	5.G.A1	1	-----
41	5.G.A2	2	-----
42	5.G.B3	2	A
43	5.G.B3	2	A, D, E
44	5.G.B4	2	-----
45	5.G.B4	2	-----

*Nevada Academic Content Standards

**Detailed objectives for Content Standards and Depth of Knowledge (DOK) descriptions
can be found on the Nevada Department of Education web site.**



**Scoring Guides
and
Student Response
Examples by
Score Point**

**Grade 5
Mathematics**

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.A1

1 Which expressions are equivalent to $4 + 1 - (9 \div 3)$? Select **all** that apply.

A $24 \div 3 - 6$

B $7 \times 3 - 14 + 9$

C $4 \times 4 + 4 \div 10$

D $8 \times 2 \div (2 + 3 \times 2)$

Scoring Notes:

Correct answers: A, D

Rationale B: uses difference between 21 and 23

Rationale C: works left to right

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.A2

2

Four descriptions of calculations are listed below.

- A six less than the product of three and twelve
- B twelve times the sum of six and three
- C three more than the quotient of twelve divided by six
- D twelve times the difference between six and three

Each description listed matches an expression below. Write the letter for each description in the box next to the expression it matches.

$(12 \div 6) + 3$

$(3 \times 12) - 6$

$12 \times (6 - 3)$

$(6 + 3) \times 12$

Scoring Notes:

C $(12 \div 6) + 3$

A $(3 \times 12) - 6$

D $12 \times (6 - 3)$

B $(6 + 3) \times 12$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.A2

3

An expression is shown below.

$$9000 \div (12 + 3)$$

Which of these describes the expression?

- A divide 9,000 by 12, then add 3
- B divide 9,000 by 12, then subtract 3
- C divide 9,000 by the sum of 12 and 3
- D divide 9,000 by the product of 12 and 3

Scoring Notes:

Rationale A: works left to right

Rationale B: works left to right and uses subtraction instead of addition

Rationale C: correct

Rationale D: uses product instead of sum

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.B3

4

The x -values and the y -values shown in the table below follow different patterns.

x	0	2	4	6	8	10
y	0	4	8	12	16	20

Which ordered pairs represent corresponding x -values and y -values in the same patterns? Select **all** that apply.

- A** (1, 1)
- B** (3, 5)
- C** (5, 10)
- D** (7, 15)
- E** (9, 18)

Scoring Notes:

Correct answers: C, E

Rationale A: each value is 1 greater than in the point (0, 0)

Rationale B: y -value in the point (2, 4) is 2 greater than the x -value

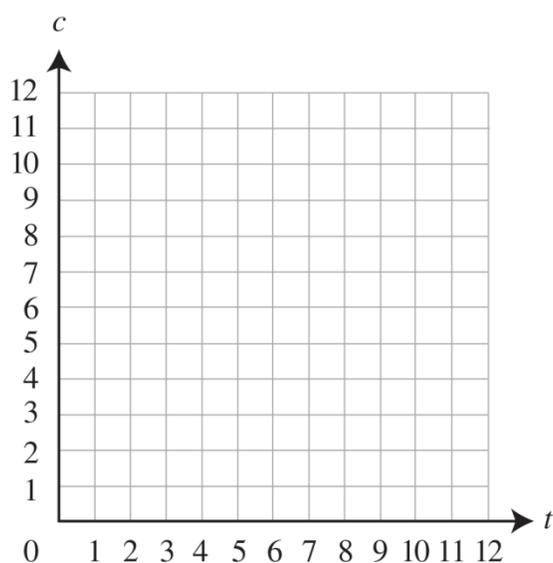
Rationale D: each value is 1 less than in the point (8, 16)

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.B3

5 When setting up a meeting room, the number of tables and the number of chairs that could be placed in the room each follow different patterns, as described below.

- The room could have no tables and no chairs.
- As the number of tables placed in the room increases by 1, the number of chairs placed in the room increases by 3 .

On the coordinate grid below, graph 5 ordered pairs to represent some of the numbers of tables (t) and some of the numbers of chairs (c) that could be placed in the room.

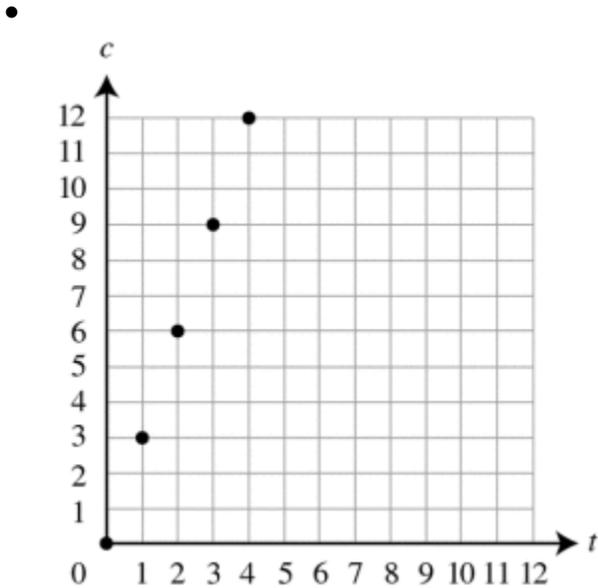


Scoring Notes:

For this item, a full-credit response (2 points) includes

- 5 correctly graphed ordered pairs, $(0, 0)$, $(1, 3)$, $(2, 6)$, $(3, 9)$, $(4, 12)$

For example,



For this item, a partial-credit response (1 point) includes

- 3 or 4 correctly graphed ordered pairs
- OR**
- 5 correct ordered pairs listed but not graphed

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.OA.B3

6

Two patterns are described below.

- A pattern of x -values starts with 1 and follows the rule “add 2 .”
- A pattern of y -values starts with 1 and follows the rule “add 1 .”

A Complete the table on the next page to show the first 5 terms in each pattern.

B Describe a relationship between the x -value and the y -value in each term. Explain why the relationship remains the same even as the x -values and y -values continue to increase.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.75 points.
1	Student scores 0.25–1.75 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A: score 2.0 points correct and complete table

 deduct 0.25 for each incorrect x or y term

 (maximum deduction of 2.0 points)

Part B: score 1.0 point correct and complete explanation
OR
 score 0.5 point partially correct or incomplete explanation
OR
 vague explanation only

Correct Answers

Part A:

Term	x	y
1	1	1
2	3	2
3	5	3
4	7	4
5	9	5

Part B: Accept all correct and complete explanations.

Sample Explanation:

The difference between the x -values and y -values increases by 1 as the term number increases by 1. Even though the x -values and the y -values continue to increase as the patterns continue, the difference between the x -values and y -values will always be 1 greater than the difference before it, because there is a difference of 1 in the pattern rules.

No 3-point responses

Instructional Materials Question 6

A

Term	x	y
1	1	1
2	3	2
3	5	3
4	7	4
5	9	5

B

There is a pattern with the two values, (x, y) .
Everytime y -value goes up one, x -value goes up higher.
Term 1, they were 0 apart. Term two, they got one value apart.
Term 3, two values apart. Term 4, three terms apart. Term 5, four
values apart, and so on. This will keep on happening, on the
other terms. That's what I see, in the relationship.

Score Point: 2

The response to Part A includes a correct and complete table (2.0). The response to Part B includes an incomplete explanation (0.5).

Instructional Materials Question 6

A

Term	x	y
1	1	1
2	3	2
3	5	3
4	7	4
5	9	5

B

The relationship between these x and y terms is that they are both single digits for each term.

The relationship here stays the same because amount of terms in the given chart above

Score Point: 2

The response to Part A includes a correct and complete table (2.0). The response to Part B is incorrect (0).

Instructional Materials Question 6

A

Term	x	y
1	2	1
2	4	2
3	6	3
4	8	4
5	10	5

B

In the graph the y-values are always going to be half of the x-values.

Score Point: 1

The response to Part A includes a table with 5 incorrect x-values (0.75). The response to Part B includes an incomplete explanation (based on answer to Part A) (0.5).

Instructional Materials Question 6

A

Term	x	y
1	2	1
2	4	2
3	6	3
4	8	4
5	10	5

B

A large grid for writing the answer to Part B, consisting of 10 columns and 10 rows.

Score Point: 1

The response to Part A includes a table with 5 incorrect x -values (0.75). The response to Part B is missing (0).

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.A1

7

Which statements about place value are true? Select **all** that apply.

- A** The value of the digit 5 in the number 6,526 is 10 times the value of the digit 5 in the number 5,241 .
- B** The value of the digit 8 in the number 8,641 is 10 times the value of the digit 8 in the number 4,803 .
- C** The value of the digit 1 in the number 105 is $\frac{1}{10}$ the value of the digit 1 in the number 1,267 .
- D** The value of the digit 3 in the number 36 is $\frac{1}{10}$ the value of the digit 3 in the number 63 .

Scoring Notes:

Correct answers: B, C

Rationale A: confuses 10 and $\frac{1}{10}$

Rationale D: confuses 10 and $\frac{1}{10}$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.A2

8

When the number 136.4 is divided by 10^2 ,
the decimal point moves

- A one place to the right.
- B one place to the left.
- C two places to the right.
- D two places to the left.

Scoring Notes:

Rationale A: one zero in 10, and moves opposite direction

Rationale B: one zero in 10

Rationale C: moves opposite direction

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.A3a

9

Which of these is equivalent to 956.208 ?

- A $(9 \times 100,000) + (5 \times 10,000) + (6 \times 1,000) + (2 \times 100) + (8 \times 1)$
- B nine hundred fifty-six and two hundred eight hundredths
- C $(9 \times 100) + (5 \times 10) + (6 \times 1) + (2 \times 0.1) + (8 \times 0.001)$
- D nine hundred fifty-six and two hundred eight

Scoring Notes:

Rationale A: ignores decimal point

Rationale B: misreads decimal

Rationale C: correct

Rationale D: misreads decimal

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.A3b

10

Five decimal numbers are listed below.

0.36 0.365 0.305 0.371 0.358

Using the blanks below, write the decimal numbers in order from **least** to **greatest**.

_____ < _____ < _____ < _____ < _____

Scoring Notes:

0.305 < 0.358 < 0.36 < 0.365 < 0.371

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.A4

11

Which number has the same value when it is rounded to the nearest tenth as when it is rounded to the nearest hundredth?

- A 3.888
- B 3.801
- C 3.567
- D 3.505

Scoring Notes:

Rationale A: digit in tenths place is the same as digit in hundredths place

Rationale B: correct

Rationale C: value in hundredths place is equal to rounded value in tenths place

Rationale D: doesn't have to round up/down when rounding to tenths place, so doesn't round for hundredths place either

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.B5

- 12** An incomplete multiplication problem is shown below.

$$\begin{array}{r} 1,507 \\ \times 39 \\ \hline \square\square\square\square\square \end{array}$$

Write a digit (0 through 9) in each box to show the product of the multiplication problem. The same digit may be used in more than one box.

Scoring Notes:

$$\begin{array}{r} 1,507 \\ \times 39 \\ \hline \boxed{5}\boxed{8}\boxed{7}\boxed{7}\boxed{3} \end{array}$$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.B6

13 A team of workers is setting up 6,450 chairs for a concert. The workers will place the chairs in 86 rows, with an equal number of chairs in each row. Which expressions can be used to find the number of chairs in each row? Select **all** that apply.

A $(6000 \div 86) + (450 \div 86)$

B $(6000 \div 50) + (450 \div 36)$

C $(6020 \div 86) + (430 \div 86)$

D $(6450 \div 80) + (6450 \div 6)$

E $(6450 \div 50) + (6450 \div 36)$

F $(6450 \div 43) + (6450 \div 43)$

Scoring Notes:

Correct answers: A, C

Rationale B: splits 6,450 into addends and thinks 86 can be split too

Rationale D: splits 86 into addends

Rationale E: splits 86 into addends

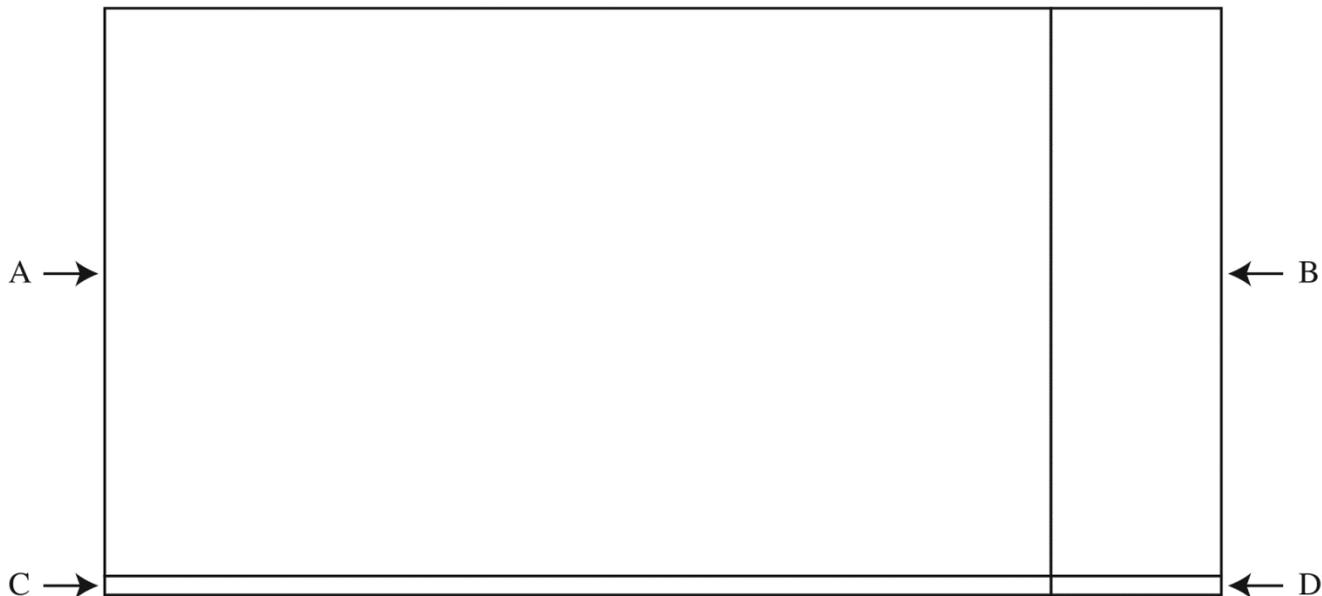
Rationale F: splits 86 into addends by dividing by 2

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.B6

14

What is the quotient of the expression $1829 \div 31$? Write the answer in the blank below.

Using the quotient and the expression, complete the area model shown below with 4 expressions to model the product 1,829 .



A: _____ × _____

B: _____ × _____

C: _____ × _____

D: _____ × _____

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct quotient, 59
- AND**
- 4 correct expressions modeling the product 1,829

For example,

- A: 30×50
- B: 30×9
- C: 1×50
- D: 1×9

For this item, a partial-credit response (1 point) includes

- correct quotient, 59
- OR**
- 3 or 4 correct expressions modeling the product 1,829
- OR**
- incorrect quotient and expressions due to a calculation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.B7

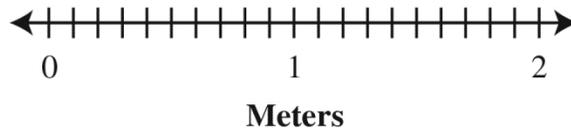
15

Jackson has 1.8 meters of rope. He cuts the rope into a number of pieces that are each 0.3 meter.

Into how many pieces does Jackson cut the rope? Write the answer in the blank below.

_____ pieces

Use the number line below to support your answer by modeling the calculation.



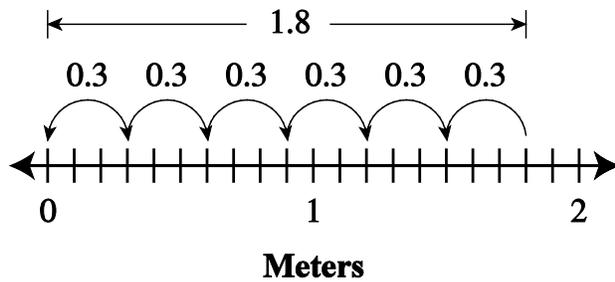
Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct number of pieces, 6
- AND**
- correct modeling of the calculation on the number line

For example,

•



For this item, a partial-credit response (1 point) includes

- correct number of pieces, 6
- OR**
- correct modeling of the calculation on the number line

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NBT.B7

16

Part of a pizza menu is shown below.

PIZZA MENU		
	Medium	Large
Plain Cheese	\$10.10	\$15.50
Basic Toppings	\$1.40 per topping	
Premium Toppings	\$2.90 per topping	

Ricky orders the two pizzas described below.

- 1 large pizza with 2 basic toppings and 1 premium topping
- 1 medium pizza with 1 basic topping and 1 premium topping

A What is the total cost, in dollars, of the pizzas Ricky orders? Show your work or explain your thinking.

The large pizza is cut into 8 equal-sized slices. The medium pizza is cut into 6 equal-sized slices.

B What is the difference, in dollars, between the cost of each slice of the large pizza Ricky ordered and the cost of each slice of the medium pizza Ricky ordered? Use pictures and/or words to explain the **reasoning** behind the strategy you used to find the difference in costs.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.5 points	correct answer with correct work or complete explanation
	OR	
	score 1.0 point	correct answer with partially correct work or incomplete explanation
	OR	incorrect answer due to calculation error (work must be shown)
OR		
	score 0.5 point	correct answer with no work or explanation
	OR	some correct procedure
	OR	partially correct or incomplete explanation
Part B:	score 1.5 points	correct answer with correct and complete explanation (based on answer from Part A)
	OR	
	score 1.0 point	correct answer with partially correct or incomplete explanation (based on answer from Part A)
	OR	incorrect answer due to a calculation error (work must be shown) with complete explanation
OR		
	score 0.5 point	correct answer with no explanation (based on answer from Part A)
	OR	partially correct or incomplete explanation
	OR	some correct procedure

Correct Answers

Part A: \$35.60

$$15.50 + 1.40 \times 2 + 2.90 = 21.20$$

$$10.10 + 1.40 + 2.90 = 14.40$$

$$21.20 + 14.40 = 35.60$$

or equivalent work

OR

Sample Explanation:

Find the total amount spent on each pizza by adding the cost of the toppings for each pizza to the basic price of each pizza. The large pizza costs \$15.50 plus 2 basic toppings for \$2.80, and \$2.90 for 1 premium topping, for a total cost of \$21.20. The medium pizza costs \$10.10 plus 1 basic topping for \$1.40 and \$2.90 for 1 premium topping, for a total cost of \$14.40. Add the total cost for each pizza for a combined total cost of \$35.60 for both pizzas.

Part B: \$0.25

Large Pizza		Medium Pizza	
\$2.00	\$2.00	\$2.00	\$2.00
\$0.50	\$0.50	\$0.40	\$0.40
\$0.15	\$0.15		
\$2.00	\$2.00	\$2.00	\$2.00
\$0.50	\$0.50	\$0.40	\$0.40
\$0.15	\$0.15		
\$2.00	\$2.00	\$2.00	\$2.00
\$0.50	\$0.50	\$0.40	\$0.40
\$0.15	\$0.15		
\$2.00	\$2.00		
\$0.50	\$0.50		
\$0.15	\$0.15		

OR

Based on the properties of operations, use multiplication, addition, and subtraction to model the division of each pizza. For the large pizza, each slice would be at least \$2.00, so multiply \$2.00 by 8 for a total of \$16.00, then subtract \$16.00 from \$21.20 to get \$5.20. Then each slice would be at least an additional \$0.50, so multiply \$0.50 by 8 and subtract \$4.00 from \$5.20 to get \$1.20. Then divide \$1.20 by 8 to find the remaining cost of each slice. So the total cost of each slice is $\$2.00 + \$0.50 + \$0.15 = \2.65 .

No 3-point responses

Instructional Materials Question 16

<p>A</p>	$\begin{array}{r} 1.40 \\ + 11.40 \\ \hline 12.80 \\ + 2.90 \\ \hline 15.70 \end{array}$	$\begin{array}{r} 71.26 \\ + 14.40 \\ \hline 85.66 \end{array}$	<p>First I found out the amount for 1 Pizza</p>
	$\begin{array}{r} \$15.50 \\ + \$05.70 \\ \hline 21.20 \end{array}$		<p>Then I decided to add up the two Basic toppings to come out with \$2.80. Next I added the Basic topping with the Premium topping and got \$5.70. The last thing I did was I added the toppings with the first Pizza and got \$21.20.</p>
	$\begin{array}{r} 1.40 \\ + 2.90 \\ \hline 4.30 \end{array}$	$\begin{array}{r} 10.10 \\ + 4.30 \\ \hline 14.40 \end{array}$	<p>Now for the Next Pizza I added the 1 basic and 1 Premium topping together and got \$4.30. Next I added the toppings with the Pizza got \$14.40 and added the two PIZZAS together to get a total of \$35.60</p>
<p>B</p>	$\begin{array}{r} 2.65 \\ 8 \overline{) 21.20} \\ \underline{16} \\ 52 \\ \underline{48} \\ 40 \\ \underline{40} \\ 0 \end{array}$		<p>First I did the cost of each slice in the large Pizza. Then I got a total of \$2.65 for each Peace in the large then I did the medium and got \$2.40 for each Peace of Pizza. The difference between the two is 25¢.</p>
	$\begin{array}{r} 240 \\ 6 \overline{) 14.40} \\ \underline{12} \\ 24 \\ \underline{24} \\ 00 \end{array}$		
	$\begin{array}{r} 265 \\ - 240 \\ \hline 25 \end{array}$		

Score Point: 2

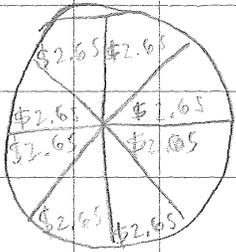
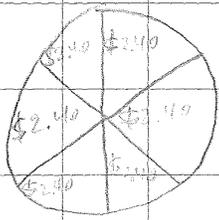
The response to Part A includes the correct answer with complete explanation (1.5). The response to Part B includes the correct answer with incomplete explanation (1.0).

Instructional Materials Question 16

A

$ \begin{array}{r} 12 \\ 02.60 \\ 02.90 \\ \hline +15.50 \\ 21.20 \\ \hline +14.40 \\ \hline 35.60 \end{array} $	$ \begin{array}{r} 11.50 \\ +2.90 \\ \hline 14.40 \end{array} $	$\$35.60$ for both pizzas
---	--	---------------------------

B

$ \begin{array}{r} \$2.65 \\ 8 \overline{)21.20} \\ \underline{-16} \\ 52 \\ \underline{-48} \\ 40 \\ \underline{-40} \\ 0 \end{array} $	$ \begin{array}{r} 2.40 \\ 6 \overline{)14.40} \\ \underline{-12} \\ 24 \\ \underline{-24} \\ 0 \end{array} $
	

Score Point: 2

The response to Part A includes the correct answer with complete explanation (1.5). The response to Part B includes some correct procedure (0.5).

Instructional Materials Question 16

A	\$	15	.	50	\$	³ 2	.	90	\$25.60
	+	\$	10	.	10	2	.	90	+ 10.00
									<u>\$35.60</u>
				25.60				1.40	
								1.40	
								+ 1.40	
								\$10.00	
									Total: \$ 35.60
B	The difference in cost is that there are								
	two more peices in the large.								

Score Point: 1

The response to Part A includes the correct answer with complete explanation (1.5). The response to Part B is incorrect (0).

Instructional Materials Question 16

<p>A The total cost, in dollars, of the pizzas</p>	$\begin{array}{r} 12 \\ 15.50 \end{array}$
<p>Ricky orders is \$25.60. This is because</p>	$\begin{array}{r} 1.40 \\ 1.40 \end{array}$
<p>I added the prices of everything Ricky</p>	$\begin{array}{r} + 2.90 \\ \hline 11.20 \end{array}$
<p>bought over there.</p>	$\begin{array}{r} 10.10 \\ 1.40 \\ + 2.90 \end{array}$
	$\boxed{25.60}$
<p>B The difference in dollars, between the cost of each slice of the large pizza Ricky ordered and the cost of each medium slice Ricky ordered is:</p>	
<p>• Large slice = \$1.93 Medium slice = \$1.68</p>	$\begin{array}{r} \boxed{1.93} \\ 15.50 \\ - 8 \\ \hline 7.50 \\ - 3.2 \\ \hline 30 \\ - 24 \\ \hline 6 \end{array}$
<p>I know this because I took the prices of each size of pizza and divided the price by the amount of how many slices they were split into.</p>	$\begin{array}{r} \boxed{1.68} \\ 10.10 \\ - 6 \\ \hline 41 \\ - 30 \\ \hline 50 \\ - 48 \\ \hline 2 \end{array}$

Score Point: 1

The response to Part A includes an incorrect answer due to a calculation error (work shown) (1.0). The response to Part B includes some correct procedure (0.5).

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.A1

17 Which expression could be used to find the sum of $4\frac{2}{3} + \frac{1}{5}$?

A $4 + \left(\frac{2}{15} + \frac{1}{15}\right)$

B $4 + \left(\frac{2 \times 1}{3 + 5}\right)$

C $4 + \left(\frac{2 + 1}{3 + 5}\right)$

D $4 + \left(\frac{10}{15} + \frac{3}{15}\right)$

Scoring Notes:

Rationale A: changes denominators but not numerators

Rationale B: incorrect procedure with fractions

Rationale C: incorrect procedure with fractions

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B3; M_5.NF.A1

18

A farmer divides 15 pounds of grapes equally among 4 boxes. The farmer adds $8\frac{1}{2}$ pounds of apples to **each** box. How many pounds of fruit are in each box? Write the answer as a mixed number in the blank below.

_____ pounds

Scoring Notes:

$12\frac{1}{4}$ (pounds)

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.A2

19 A statement and three tables are shown below. Place a check mark next to the number in each table that completes the statement and makes it true.

Anna made cups of trail mix by combining cup of peanuts, $1\frac{1}{8}$ cups of almonds, and cup of raisins. Anna's trail mix includes fewer cups of raisins than peanuts.

Option 1	
$\frac{1}{4}$	
3	
$\frac{3}{8}$	
2	
$\frac{1}{2}$	
4	

Option 2	
$\frac{1}{4}$	
3	
$\frac{3}{8}$	
2	
$\frac{1}{2}$	
4	

Option 3	
$\frac{1}{4}$	
3	
$\frac{3}{8}$	
2	
$\frac{1}{2}$	
4	

Scoring Notes:

Option 1: 2

Option 2: $\frac{1}{2}$

Option 3: $\frac{3}{8}$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.A2

20

The amounts of salt Lena needs for the different types of cookies she is making are listed below.

- $\frac{3}{4}$ teaspoon of salt for oatmeal cookies
- $\frac{1}{2}$ teaspoon of salt for peanut butter cookies
- $\frac{5}{8}$ teaspoon of salt for sugar cookies

Lena ESTIMATES that the total amount of salt she needs to make all the different types of cookies is 2 teaspoons. By how many teaspoons does Lena overestimate or underestimate the total amount of salt she actually needs? Show your work **and** explain your thinking.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct number of teaspoons, $\frac{1}{8}$

AND

- work and explanation indicating how the overestimation of the total amount of salt was determined

For example,

- Lena overestimated the amount of salt she needs by $\frac{1}{8}$ teaspoon. She needs $1\frac{7}{8}$ teaspoon of salt to make all the cookies.

$$\frac{3}{4} + \frac{1}{2} + \frac{5}{8} =$$

$$\frac{6}{8} + \frac{4}{8} + \frac{5}{8} = \frac{15}{8} = 1\frac{7}{8}$$

$$1 \text{ teaspoon is equal to } \frac{8}{8}, \text{ and } 1\frac{8}{8} - 1\frac{7}{8} = \frac{1}{8}.$$

For this item, a partial-credit response (1 point) includes

- correct number of teaspoons, $\frac{1}{8}$

OR

- correct number of teaspoons with work but no explanation

OR

- incorrect number of teaspoons due to a calculation error (work must be shown) with some explanation indicating how the total amount of salt was determined

OR

- some explanation indicating how the overestimation of the total amount of salt was determined with no work shown

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B3; M_5.NF.B6

21

John plans to walk 10 miles in 3 hours. He plans to walk the same number of miles each hour.

- A** Write and solve an equation to find the number (n) of miles that John plans to walk each hour. Write your answer as a mixed number. Explain why your answer is correct.
- B** John actually walks $2\frac{1}{2}$ miles in the first hour of the walk. He multiplies $2\frac{1}{2} \times 3$ and comes to the conclusion that it may take longer than he originally planned to finish his walk. Explain why John is correct, and find how much longer, in hours, it will take him to finish his walk.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.5 points	correct answers with correct and complete explanation
	OR	
	score 1.0 point	correct answers with partially correct or incomplete explanation
	OR	
	score 0.5 point	one correct answer with partially correct or incomplete explanation
	OR	
		correct answers with no explanation
	OR	
		partially correct or incomplete explanation
	OR	
		some correct procedure
Part B:	score 1.5 points	correct answer with correct and complete explanation
	OR	
	score 1.0 point	correct answer with partially correct or incomplete explanation
	OR	
		incorrect answer based on a calculation error (work must be shown) with complete explanation
OR		
	score 0.5 point	correct answer with no explanation
	OR	
		partially correct or incomplete explanation
	OR	
		some correct procedure

Correct Answers

Part A: $10 \div 3 = n$
or equivalent equation

AND

$3\frac{1}{3}$ (miles)

AND

Sample Explanation:

The answer is correct because division is also shown by a fraction bar, so $10 \div 3 = \frac{10}{3}$. Since $\frac{10}{3}$ is an improper fraction, convert the improper fraction to $3\frac{1}{3}$ for the answer.

Part B: 1 (hour)

AND

Sample Explanation:

John multiplied the number of miles he walked in the first hour by 3. Since $2\frac{1}{2} \times 3 = 7\frac{1}{2}$, and since the walk is 10 miles long, he will not be finished after 3 hours, based on hiking the same $2\frac{1}{2}$ miles each hour. $10 - 7\frac{1}{2} = 2\frac{1}{2}$, so after 3 hours he will have $2\frac{1}{2}$ miles remaining. He can walk this distance in 1 additional hour.

Instructional Materials Question 21

A

$$\begin{array}{r} 3 \overline{) 10.00} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

John should walk about $3\frac{1}{3}$ miles per hour.

$n = 10 \div 3$

$\left(\frac{1}{3}\right)$

John plans to walk the same number of miles each hour

The answer is about $3\frac{1}{3}$ because in order to find out (n) you need to divide the total amount of miles (10) by the total amount of time (3 hours)

$n = 10 \div 3$

B

$$\begin{array}{r} 2 \overline{) 150} \\ \underline{-14} \\ 10 \\ \underline{-10} \\ 0 \end{array}$$

$$2\frac{1}{2} = \frac{5}{2} \times \frac{3}{1} = \frac{15}{2}$$

John's conclusion is correct. In 3 hours John will only have walked $7.5/7\frac{1}{2}$ miles $\left(2\frac{1}{2} \times \frac{3}{1} = \frac{15}{2} = 7\frac{1}{2}\right)$

It will take another hour for John to finish his walk

$$\begin{array}{r} 2.5 \overline{) 10} \\ \underline{-10} \\ 0 \end{array}$$

$$\begin{array}{r} 09 \\ 1010 \\ \underline{-75} \\ 25 \end{array}$$

$$\begin{array}{r} 4 \\ \underline{-3} \\ 1 \end{array}$$

$$\begin{array}{r} 4.0 \\ \times 2.5 \\ \hline 200 \\ 800 \\ \hline 1000 \end{array}$$

Score Point: 3

The response to Part A includes the correct answers with correct and complete explanation (1.5).

The response to Part B includes the correct answer with correct and complete explanation (1.5).

Instructional Materials Question 21

A

Equation = $10 \div 3 = n$

Answer = $3\frac{1}{3}$

$$\begin{array}{r} 3\frac{1}{3} \\ 3 \overline{)10} \\ \underline{9} \\ 1 \end{array}$$

He will walk $3\frac{1}{3}$ miles each hour. My answer is correct because to solve this you need to divide the number of miles by the number of hours. ($10 \div 3$) Since 3 cannot go into 10 evenly there is $\frac{1}{3}$. After dividing you will end up with $3\frac{1}{3}$. To justify this answer circle $3\frac{1}{3}$ 3 times. After adding you will end up with 10 with no remainders.

B

Equation: $2\frac{1}{2} \times 3 =$ $2 \times 3 = 6$ $6 + 1\frac{1}{2} = 7\frac{1}{2}$
 Answer: 1 hr $\frac{1}{2} \times 3 = \frac{3}{2} = 1\frac{1}{2}$

John is correct because if you solve $2\frac{1}{2} \times 3$ the answer is $7\frac{1}{2}$. He needs to travel 10 miles. He will walk one hour longer than planned. I got this answer by turning $7\frac{1}{2}$ into a decimal (7.5). Then I subtracted 7.5 from 10 and got 2.5. I then converted 2.5 into a fraction which is $2\frac{1}{2}$. That means he needs to walk $2\frac{1}{2}$ miles more which means he needs to walk for 1 hour more because $2\frac{1}{2}$ is what he walked the first hr.

$7\frac{1}{2} = 7.5$ $10 - 7.5 = 2.5$ $2.5 = \text{miles left}$
 $2.5 = 2\frac{1}{2}$ $2\frac{1}{2} = 1 \text{ hr.}$

Score Point: 3

The response to Part A includes the correct answers with correct and complete explanation (1.5).

The response to Part B includes the correct answer with correct and complete explanation (1.5).

Instructional Materials Question 21

A $10 \div 3 = 3 \frac{1}{3}$. My answer is correct because if you divide the hours for how many miles he walked (10) you'll get $10 \div 3 = 3 \frac{1}{3}$.

$$\frac{5}{2} \times \frac{4}{1} = \frac{20}{2}$$

$$\frac{5}{2} \times \frac{3}{1} = \frac{15}{2}$$

B John is correct because he's walked only $2 \frac{1}{2}$ miles in one hour, so if he wants to walk for 3 hours, he would only walk $7 \frac{1}{2}$ miles. It would take him 4 hours instead of 3 hours to walk 10 miles.

Score Point: 2

The response to Part A includes one correct answer with incomplete explanation (0.5). The response to Part B includes the correct answer with correct and complete explanation (1.5).

Instructional Materials Question 21

A

$$10 \div 3 = N$$

$$10 \div 3 = 3\frac{1}{3}$$

My answer is correct because $3 \cdot 3 = 9$ and

$$\frac{1}{3} \cdot 3 = 1 \text{ and } 9 + 1 = 10 \dots$$

Therefore...

$$\begin{array}{ccc} 10 & \div & 3 = 3\frac{1}{3} \\ \text{miles} & & \text{Miles Per hour} \\ \text{hours} & & \end{array}$$

B

John is correct because $2\frac{1}{2} \cdot 3 = 7\frac{1}{2}$.

He will need to walk 1 more hour at the same rate to finish the walk.

Score Point: 2

The response to Part A includes the correct answers with correct and complete explanation (1.5).

The response to Part B includes the correct answer with incomplete explanation (1.0).

Instructional Materials Question 21

A

$$3 \overline{) 10.00} \begin{array}{r} 3.3 \\ \underline{9} \\ 10 \end{array}$$

John would have to walk

33 miles an hour if he wants to walk the same amount each hour.

B

$2\frac{1}{2} \times 3 = 7\frac{1}{2}$ John is correct because $2\frac{1}{2} \times 3 = 7\frac{1}{2}$ miles so he is correct. John has $2\frac{1}{2}$ miles left so he keeps on the same pace.

Score Point: 1

The response to Part A includes some correct procedure (0.5). The response to Part B includes some correct procedure (0.5).

Instructional Materials Question 21

A

	Miles	Hours
1	10	3
2	20	6
3	30	9
4	40	10
5	50	11

This graph shows
Johns plans if it
stays the same as
planned.

B John is correct, in 3 hours he will walk $7\frac{1}{2}$ miles.
Due to this he will have to walk an extra hour
for 10 miles.

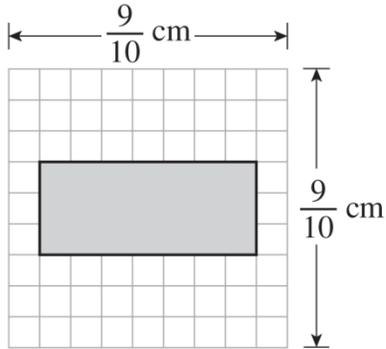
Score Point: 1

The response to Part A is incorrect (0). The response to Part B includes the correct answer with an incomplete explanation (1.0).

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B4b

22

A rectangle is shown on the grid below.



Which equation is true and could be used to find the area, in square centimeters, of the rectangle?

- A $\frac{7}{10} \times \frac{3}{10} = \frac{21}{100}$
- B $\frac{7}{10} \times \frac{3}{10} = \frac{21}{10}$
- C $\frac{7}{10} + \frac{3}{10} = \frac{10}{10}$
- D $\frac{3}{7} + \frac{9}{10} = \frac{93}{70}$

Scoring Notes:

Rationale A: correct

Rationale B: incorrect denominator in product

Rationale C: adds instead of multiplying

Rationale D: uses ratio of width/length + grid side length

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B5a

23

The product of which expression is **less** than the product of $225 \times \frac{3}{5}$?

A 225×1

B $225 \times \frac{2}{5}$

C $225 \times \frac{3}{4}$

D $225 \times \frac{4}{5}$

Scoring Notes:

Rationale A: greater than; thinks 1 is less than 3 or 5 in fraction

Rationale B: correct

Rationale C: reduces denominator, thinking that will produce a lesser value

Rationale D: greater than

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B5b; M_5.NF.B6

24

A teacher stacks 12 books on top of each other. Each book adds $\frac{3}{4}$ inch to the height of the stack of books. Explain why the height of the stack of books must be **less** than 12 inches. As part of your explanation, find the height, in inches, of the stack of books.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct height of the stack of books, 9 (inches)
- AND**
- explanation indicating why the height of the stack of books must be less than 12 inches

For example,

- The height is less than 12 inches because when you multiply a whole number by a fraction less than 1, the result will always be less than the whole number. In this case, multiply $12 \times \frac{3}{4}$ to get 9, so the height is 9 inches.

For this item, a partial-credit response (1 point) includes

- correct height of the stack of books, 9 (inches)
- OR**
- some explanation indicating why the height of the stack of books must be less than 12 inches

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B6

25

Sheri used $\frac{2}{3}$ of the amount of butter that was called for in a recipe. The recipe called for $2\frac{1}{2}$ cups of butter. The equation below can be used to find the number (n) of cups of butter that Sheri used.

$$n = \frac{2}{3} \times 2\frac{1}{2}$$

What is the value of n ? Write the answer as a mixed number in the blank below.

Scoring Notes:

$$1\frac{2}{3}$$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B7a

26 A fraction is missing from the equations below.

$$\frac{1}{2} \div 4 = \frac{\square}{\square}$$

$$\frac{\square}{\square} \times 4 = \frac{1}{2}$$

Use the bar below to write the fraction that completes the equations and makes them true.

Scoring Notes:

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

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B7b

27 Harley uses 8 gallons of water to water all his plants. He uses $\frac{1}{4}$ gallon of water for each plant. How many plants does Harley water? Write the answer in the blank below.

_____ plants

Scoring Notes:

32 (plants)

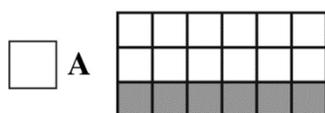
Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.NF.B7c

28

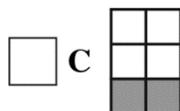
Devon has a bag of popcorn that is $\frac{1}{3}$ full.

She puts all the popcorn into 6 cups, with an equal amount of popcorn in each cup.

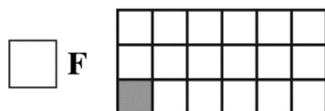
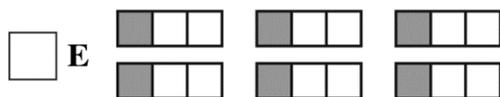
Which of these represent the fraction of the bag of popcorn that Devon puts into each cup? Select **all** that apply.



B 18



D $\frac{1}{18}$



Scoring Notes:

Correct answers: D, F

Rationale A: represents $\frac{1}{3}$ of 18

Rationale B: calculates denominator only

Rationale C: represents $\frac{1}{3}$ of 6

Rationale E: represents $\frac{1}{3} \times 6$

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.A1

29

A fish tank holds 50 **gallons** of water. Maria removes 16 **cups** of water from the fish tank. How many **quarts** of water remain in the fish tank?

- A 34 quarts
- B 46 quarts
- C 184 quarts
- D 196 quarts

Scoring Notes:

Rationale A: $50 - 16$

Rationale B: converts 16 cups to 4 quarts, subtracts the result from 50

Rationale C: $50 \times 4 - 16$

Rationale D: correct

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.A1

30

Heather and Anya are making bookmarks with pieces of yarn.

- Heather has 72 inches of yarn.
- Anya has 5 feet of yarn.
- It takes 6 inches of yarn to make one bookmark.

Which of these statements are true? Select **all** that apply.

- A** Heather and Anya have the same amount of yarn.
- B** Anya can make 10 bookmarks.
- C** Heather has 1 more foot of yarn than Anya has.
- D** Heather can make 14 bookmarks.
- E** Together, Heather and Anya can make 22 bookmarks.

Scoring Notes:

Correct answers: B, C, E

Rationale A: converts 5 feet to inches incorrectly

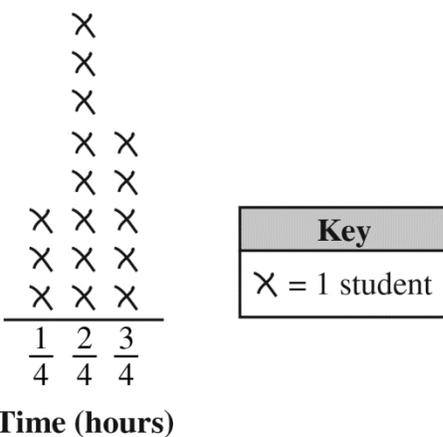
Rationale D: rounds up instead of down

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.B2

31

The line plot below shows the amounts of time that some students spent working on a class project.

Class Project



Using the information in the line plot, select true or false for **each** statement.

- A** The students spent a total of $8\frac{2}{4}$ hours working on the class project.
 True False
- B** The students spent a total of 16 hours working on the class project.
 True False
- C** All the students who worked for $\frac{1}{4}$ hour and all the students who worked for $\frac{3}{4}$ hour spent the same total amount of time working on the class project as all the students who worked for $\frac{2}{4}$ hour.
 True False
- D** All the students who worked for $\frac{1}{4}$ hour and all the students who worked for $\frac{3}{4}$ hour spent a greater total amount of time working on the class project than all the students who worked for $\frac{2}{4}$ hour.
 True False

Scoring Notes:

True: A, D

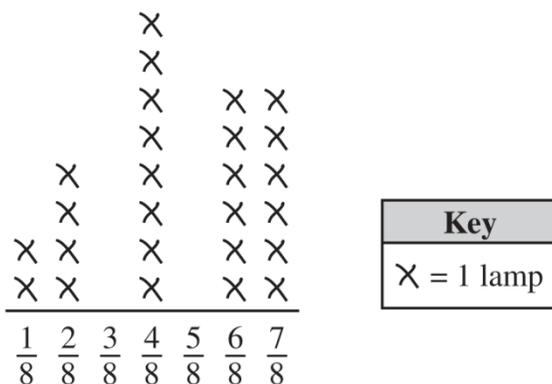
False: B, C

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.B2

32

Each of 26 lamps held 1 liter of oil before an event. Miguel checked the oil level in each lamp after the event. He made the line plot below to show the amount of oil remaining in each lamp.

Oil Level in Lamps



Key
X = 1 lamp

**Fraction of 1 Liter
of Oil Remaining**

How much oil does Miguel need to completely fill all 26 of the lamps before the next event? Show your work or explain your thinking.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct amount of oil, 11 (liters)

AND

- correct work showing how the amount of oil needed was determined

OR

- explanation indicating how the amount of oil needed was determined

For example,

- $2 \times \left(1 - \frac{1}{8}\right) = \frac{14}{8}$

$$4 \times \left(1 - \frac{2}{8}\right) = \frac{24}{8}$$

$$8 \times \left(1 - \frac{4}{8}\right) = \frac{32}{8}$$

$$6 \times \left(1 - \frac{6}{8}\right) = \frac{12}{8}$$

$$6 \times \left(1 - \frac{7}{8}\right) = \frac{6}{8}$$

$$\frac{14}{8} + \frac{24}{8} + \frac{32}{8} + \frac{12}{8} + \frac{6}{8} = \frac{88}{8} = 11$$

OR

- The amount of oil needed to fill the oil lamps will be the same as the amount of oil used, so determine how much oil was used. Subtract the amount of oil remaining from 1 liter to find how much oil was used and then multiply that amount by the number of times it was recorded in the line plot. Then add all of the used oil amounts to determine the total amount of oil needed.

For this item, a partial-credit response (1 point) includes

- correct amount of oil, 11 (liters)

OR

- some explanation indicating how the amount of oil needed was determined

OR

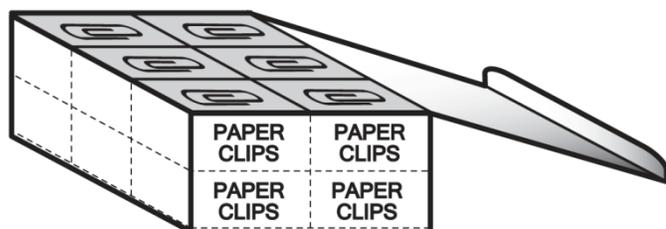
- incorrect amount of oil due to a calculation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C4

33

The picture below shows a box that is shaped like a rectangular prism and packed, with no gaps or overlaps, with smaller boxes of paper clips.



Each box of paper clips is also shaped like a rectangular prism and has a volume of 6 cubic inches. What is the volume of the box holding all the boxes of paper clips?

- A 60 cubic inches
- B 66 cubic inches
- C 72 cubic inches
- D 96 cubic inches

Scoring Notes:

Rationale A: 6×10 (10 visible boxes)

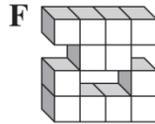
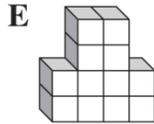
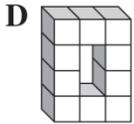
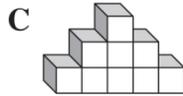
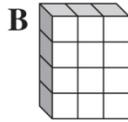
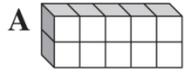
Rationale B: 6×11 (6 boxes on left + 5 visible faces on right)

Rationale C: correct

Rationale D: 6×16 (16 visible faces)

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C4

34 Circle **each** figure below that has a volume of 12 cubic units.



Scoring Notes:

Correct answers: B, E, F

Rationale A: miscounted number of cubes

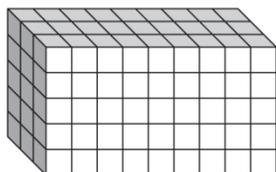
Rationale C: miscounted number of cubes

Rationale D: miscounted number of cubes

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C5a

35

Julio packed the greatest number of unit cubes possible into a box shaped like a rectangular prism, as pictured below.



Could Julio use each expression below to find the volume, in cubic units, of the box? Select yes or no for **each** expression.

- A** $9 + (3 + 5)$ Yes No
- B** $(9 \times 3) \times 5$ Yes No
- C** $(9 + 3) \times (9 + 5)$ Yes No
- D** $9 \times (5 \times 3)$ Yes No
- E** $(9 \times 5) \times 3$ Yes No
- F** $(9 \times 5) + (9 \times 3)$ Yes No

Scoring Notes:

Yes: B, D, E

No: A, C, F

Rationale A: uses addition instead of multiplication

Rationale C: incorrectly applies the distributive property

Rationale F: incorrectly applies the distributive property

Nevada Instructional Materials Phase III
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36

A container is shaped like a right rectangular prism. The volume of the container is 450 cubic inches. The length of the container is 15 inches. Write a possible width and height of the container in the blanks below. Write the answers as whole numbers only.

Width: _____ inches

Height: _____ inches

Scoring Notes:

Any of the following pairs of numbers in any order to create a product of 30:

1 and 30 **OR**

2 and 15 **OR**

3 and 10 **OR**

5 and 6

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C5b

37

Two storage sheds are shaped like right rectangular prisms. The measurements of each shed are listed below.

- Shed A is 10 feet (ft) long by 10 ft wide by 12 ft high.
- Shed B is 8 ft high, and the area of the base is 120 ft².

How much greater is the volume, in cubic feet, of shed A than the volume of shed B ? Show all your work.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- correct amount, 240 (cubic feet)
- AND**
- correct work

For example,

- $10 \times 10 \times 12 = 1200$
 $8 \times 120 = 960$
 $1200 - 960 = 240$

For this item, a partial-credit response (1 point) includes

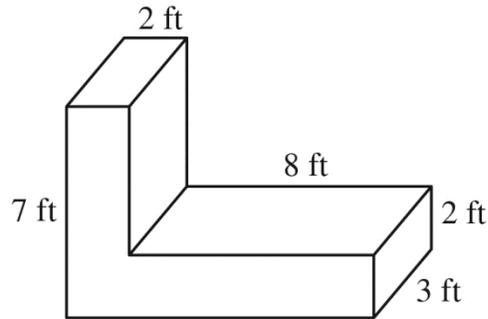
- correct amount, 240 (cubic feet)
- OR**
- correct volume for shed A
- OR**
- correct volume for shed B
- OR**
- incorrect amount due to a calculation error (work must be shown)

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C5c

38

The figure shown below is made up of two non-overlapping right rectangular prisms.



What is the volume of the figure? Write the answer in the blank below.

_____ cubic feet (ft^3)

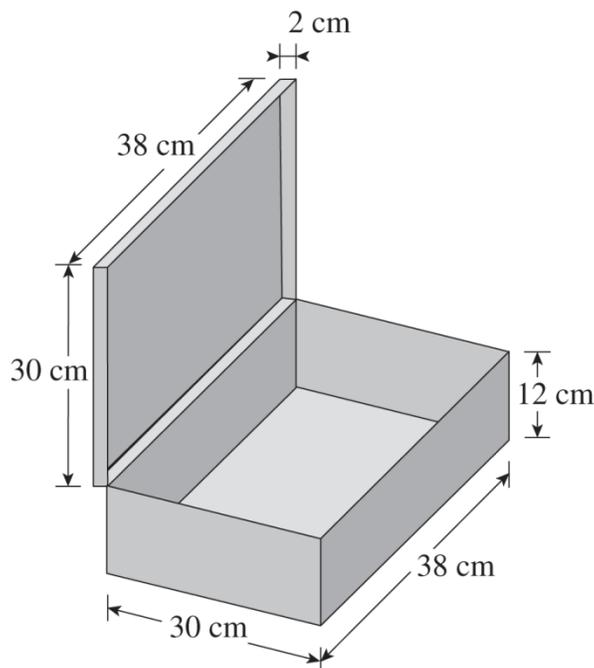
Scoring Notes:

90 (cubic feet (ft^3))

Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.MD.C5c; M_5.MD.C5b

39

Brandon purchased a storage box shaped like a rectangular prism to hold some CDs. A diagram of the box is shown below, along with the inside measurements of the top and the bottom of the box. The top and the bottom of the box do **not** overlap when the box is closed.



- A** What is the total volume, in cubic centimeters (cm^3), of the box when it is closed? Show your work or explain your thinking.

Brandon hopes the box will hold 100 CD cases. Each CD case that Brandon wants to put in the box is shaped like a rectangular prism and measures 12 cm by 12 cm by 1 cm.

- B** Based on the given measurements, explain why the storage box is **not** large enough to hold 100 CD cases. As part of your explanation, include a greatest number of CD cases that the box could **most** likely hold. Show all your work.

Write your response on the grid on the next page.

Scoring Notes:

Score	Description
3	Student scores 3 points.
2	Student scores 2–2.5 points.
1	Student scores 0.5–1.5 points.
0	Student’s response provides insufficient evidence of appropriate skills or knowledge to successfully accomplish the task.
Blank	No student response.

Score Points

Part A:	score 1.5 points	correct answer with correct work or complete explanation
	OR	
	score 1.0 point	correct answer with partially correct work or incomplete explanation
	OR	incorrect answer due to calculation error (work must be shown)
OR		
	score 0.5 point	correct answer with no work or explanation
	OR	partially correct or incomplete explanation
	OR	some correct procedure
Part B:	score 1.5 points	correct answer (answers may vary) with correct work and correct and complete explanation
	OR	
	score 1.0 point	correct answer (answers may vary) with correct work and partially correct or incomplete explanation
	OR	
OR		
	score 0.5 point	correct answer (answers may vary) with no work and partially correct or incomplete explanation
	OR	partially correct or incomplete explanation
	OR	some correct procedure
OR		correct answer with no work and no explanation

Correct Answers

Part A: 15960 (cm³)

$$30 \times 38 \times 2 = 2280$$

$$30 \times 38 \times 12 = 13680$$

$$2280 + 13680 = 15960$$

or equivalent work

OR

Sample Explanation:

Find the total volume of the box when the lid is closed by finding the volume of the bottom of the box by multiplying the length, 38 cm, times the width, 30 cm, times the height, 12 cm, and by finding the volume of the lid by multiplying the length, 38 cm, times the width, 30 cm, times the depth of the lid, 2 cm, and then adding the two volumes together, $2280 \text{ cm}^3 + 13680 \text{ cm}^3$, which is 15960 centimeters cubed.

Part B: Answers may vary. Accept about 80 to 90 as correct.

Sample Answers:

90 (CD cases)

There isn't enough volume to store 100 CD cases. The box is 38 cm long, so he should be able to store 3 rows of CD cases since each CD case is 12 cm long. This should take up 36 cm across the length of the box since $12 + 12 + 12 = 36$. There will be 2 cm left over.

With the CD cases stored standing up, each CD case is 12 cm tall and the total height (both top and bottom) of the box is $12 + 2 = 14$ cm. So with the CD cases stored this way, he will only be able to have one layer of CD cases in the box. There will be 2 cm left over at the top since $14 - 12 = 2$.

The thickness of each CD case is 1 cm and the box is 30 cm wide. So, with the CD cases stored standing up, he should be able to store 30 CD cases in each row. With 3 rows of 30 CD cases per row, he most likely will be able to store $3 \times 30 = 90$ CD cases, not 100 CD cases.

OR

84 (CD cases)

There isn't enough volume to store 100 CD cases. The box is 38 cm long, so he should be able to store 3 rows of CD cases since each CD case is 12 cm long. This should take up 36 cm across the length of the box since $12 + 12 + 12 = 36$. There will be 2 cm left over.

With each CD case laying flat in the box, he should be able to store 2 piles of CD cases in each of the 3 rows since the box is 30 cm wide and each CD case is 12 cm wide. There will be 6 cm left over since $30 - 12 - 12 = 6$. So there will be a total of $2 \times 3 = 6$ piles of CD cases in the box.

The thickness of each CD case is 1 cm. Since the box is $12 + 2 = 14$ cm tall, he should be able to store 14 CD cases in each pile since $14 \times 1 = 14$. With 6 piles, he should be able to store a total of $6 \times 14 = 84$ CD cases, not 100 CD cases.

No 3-point responses

Instructional Materials Question 39

A	Equation: $38 \times 30 \times 14 = n$ Answer: $15,960 \text{ cm}^3$	$2 + 12 = 14$	$\begin{array}{r} 30 \\ \times 38 \\ \hline 240 \\ + 900 \\ \hline 1140 \end{array}$	$\begin{array}{r} 1140 \\ \times 14 \\ \hline 4560 \\ + 11400 \\ \hline 15960 \end{array}$
<p>The answer I got was $15,960 \text{ cm}^3$. I got the answer by following the rule of how to find the volume which is length \times width \times height. The equation I used was $38 \times 30 \times 14 = n$. 38 is the length, 30 is the width, and 14 the the total height. I multiplied the length and width first (38×30) and I got 1140. I then multiplied 1140 with 14 and ended up with 15960. Keep in mind the height is 14 because the boxes closed. The total volume is $15,960 \text{ cm}^3$.</p>				
B	Equation: $12 \times 12 \times 1 = 144 \times 100 = x / 15,960 \times x =$ Answer: Around 90	$12 \times 12 = 144$ $144 \times 100 = 14,400$	$\begin{array}{r} 3 \cancel{144} \\ \times 90 \\ \hline 1296 \\ + 12960 \\ \hline 14256 \end{array}$	
<p>The storage box's measurements are 38 by 30 by 14. The volume of each disk is 144 and the volume of the box is 15,960. There are 100 disk. The largest cd's the box could hold would be around 90. Brandon cannot fit all the 100 cd's he wishes to fit. He can only fit around 90 of those 100 cd's.</p>				

Score Point: 2

The response to Part A includes the correct answer with complete explanation (1.5). The response to Part B includes a correct answer with incomplete explanation (1.0).

Instructional Materials Question 39

A When Brandon's CD box is closed the volume is 15960 cm^3 . First I found the volume of the bottom part which is 13680 cm^3 . Then I found the volume of the top part which is 2280 cm^3 . Lastly, I added them together to get 15960 cm^3 , the volume, of Brandon's CD box.

B Brandon's CD box is not large enough to hold 100 CD cases because his box is only 14 cm high, which means he can go 14 CD's up. It's 38 cm long, which means it can go 3 CD's across. And it's 30 cm wide which means it can go 2 CD's wide. When you multiply how many CD's will fit each way you only get 84 CD's. The box is only able to most likely hold 84 CD's.

Score Point: 2

The response to Part A includes the correct answer with incomplete explanation (1.0). The response to Part B includes a correct answer with correct and complete explanation (1.5).

Instructional Materials Question 39

A

$$\begin{array}{r} 38 \\ \times 30 \\ \hline 1140 \end{array}$$

$$15,960 \text{ cm}$$

$$\begin{array}{r} 12 \\ \times 12 \\ \hline 24 \\ 120 \\ \hline 144 \end{array}$$

$$\begin{array}{r} 14 \\ \times 4560 \\ \hline 1400 \\ 15960 \end{array}$$

$$\begin{array}{r} 11 \\ 144 \overline{)15960} \\ \underline{-144} \\ 156 \\ \underline{-144} \\ 120 \end{array}$$

B

It cannot hold 100 cds because if you multiply it all you would get 144, and if you divide it by 15,960 you'll find out that it can fit at the most 11 discs.

Score Point: 1

The response to Part A includes the correct answer with correct work, but an incorrect unit (1.0). The response to Part B is incorrect (0).

Instructional Materials Question 39

A

$\begin{array}{r} 38 \\ \times 30 \\ \hline 00 \\ 1140 \\ \hline 1140 \end{array}$	$\begin{array}{r} 140 \\ \times 100 \\ \hline 0000 \\ 14000 \\ \hline 13680 \end{array}$	<p>The total volume of the box when it is closed is $13,680 \text{ cm}^3$.</p>
--	--	---

B

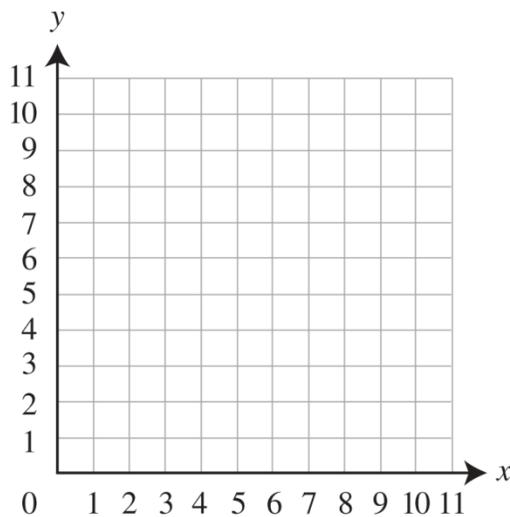
$\begin{array}{r} 12 \\ \times 12 \\ \hline 24 \\ 120 \\ \hline 144 \end{array}$	$\begin{array}{r} 144 \\ \times 100 \\ \hline 0000 \\ 14400 \\ \hline 14400 \end{array}$	<p>It doesn't fit all of the CD cases because it adds up to $14,400 \text{ cm}^3$ and the box is $13,680 \text{ cm}^3$ big.</p>
--	--	---

Score Point: 1

The response to Part A includes some correct procedure (0.5). The response to Part B includes some correct procedure, based on the answer to Part A (0.5).

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Grade 5 Mathematics
NVACS: M_5.G.A1

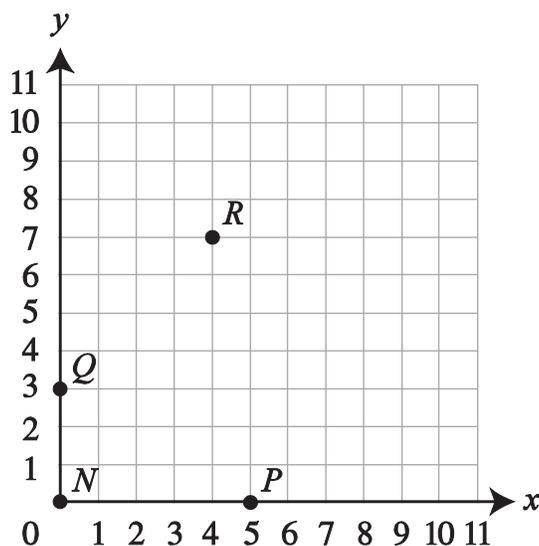
40 A coordinate grid is shown below.



On the coordinate grid, graph and label the four points described below.

- Point *N* is located at the origin.
- Point *P* is located on the *x*-axis, 5 units away from the origin.
- Point *Q* is located on the *y*-axis, 3 units away from the origin.
- Point *R* has an *x*-coordinate of 4 and a *y*-coordinate of 7.

Scoring Notes:



Nevada Instructional Materials Phase III
Grade 5 Mathematics
NVACS: M_5.G.A2; M_5.OA.B3

41

Kerri hiked near a lake in the mountains. The table below shows the total distance she had traveled after each hour of the hike.

Kerri's Hike

Time (hours)	1	2	3	4
Distance (miles)	2	4	6	8

A On the graph on the next page, graph the pairs of values in the table as ordered pairs. Be sure to include a label and scale on each axis.

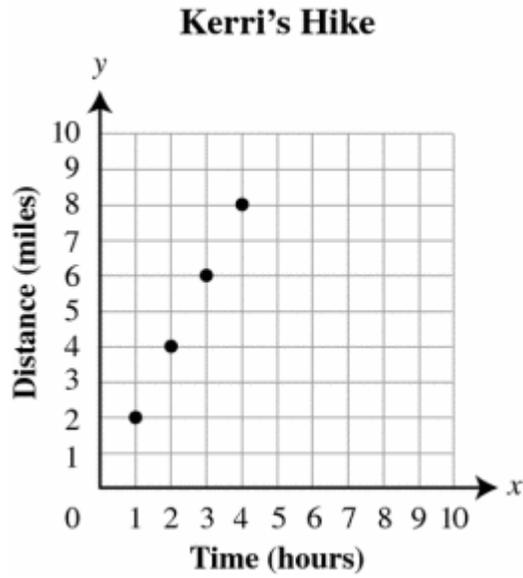
The pairs of values in the table form a pattern.

B What rule explains the relationship between the values in each ordered pair?

Write your response on the grid on the next page.

Correct Answers

Part A:

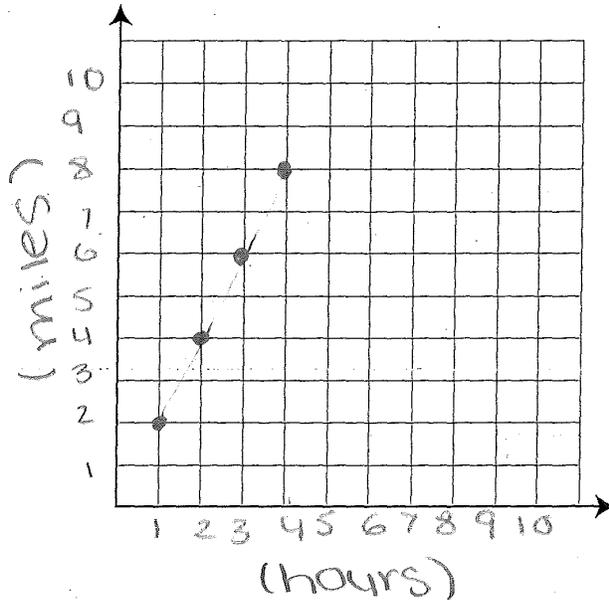


Part B: Multiply time by 2 to equal distance.
or equivalent rule

Instructional Materials Question 41

A

Kerri's Hike



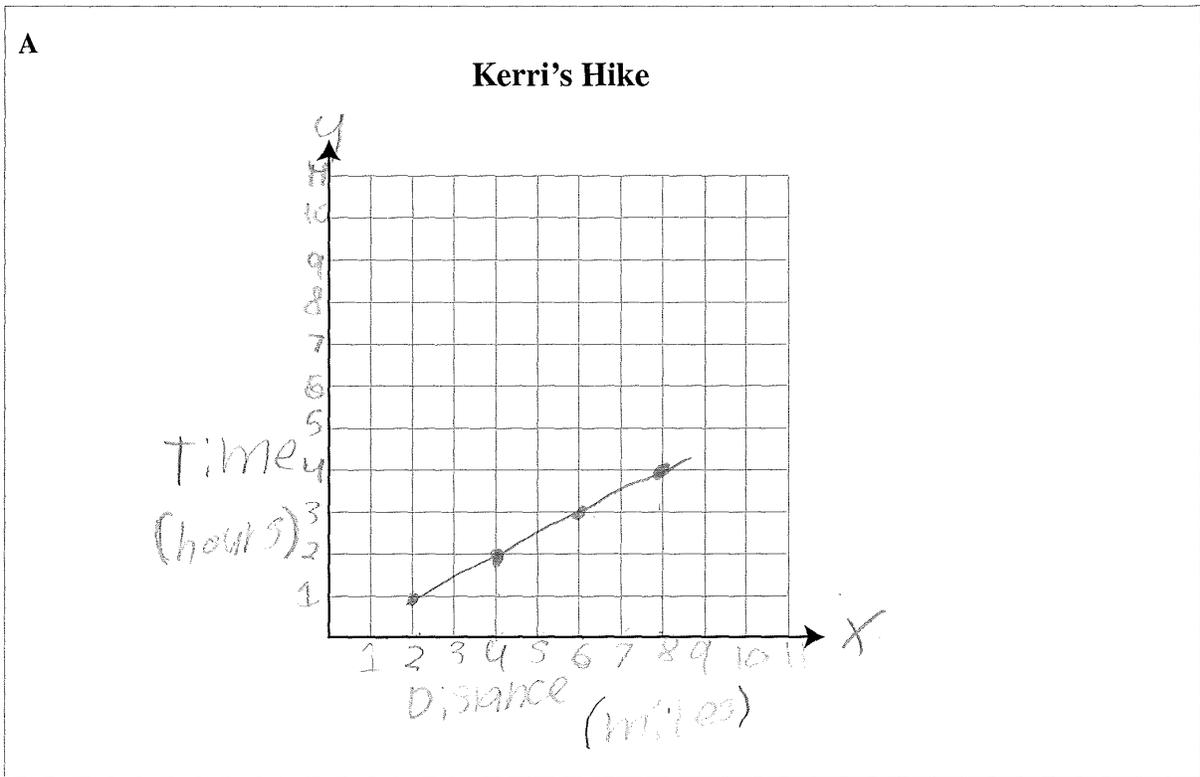
B

The relationship between the
 2 order pairs is times two by
 the hours because she hiked
 1 hour and did 2 miles and $1 \times 2 = 2$
 and in 4 hours she did 8 miles
 $4 \times 2 = 8$.

Score Point: 3

The response to Part A includes a correct and complete graph (2.0). The response to Part B includes a correct and complete rule (1.0).

Instructional Materials Question 41



B Time $\times 2 =$ Distance

Ex. $1 \times 2 = 2$ $2 \times 2 = 4$ $3 \times 2 = 6$ $4 \times 2 = 8$

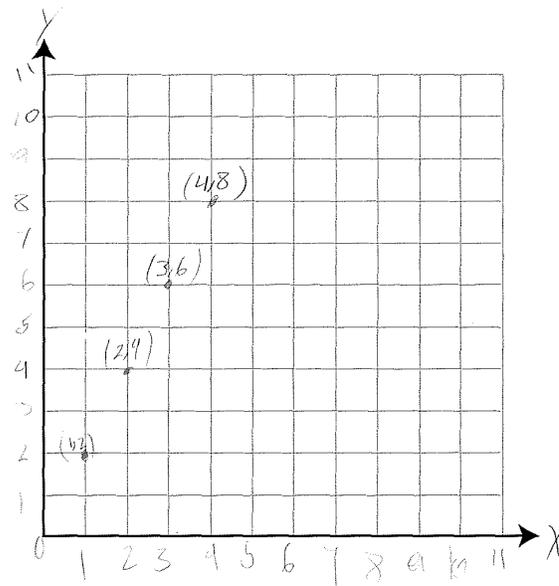
Score Point: 3

The response to Part A includes a correct and complete graph (2.0). The response to Part B includes a correct and complete rule (1.0).

Instructional Materials Question 41

A

Kerri's Hike



B

The rules that explain the relationship between the values is that it just doubles the number like times 2.

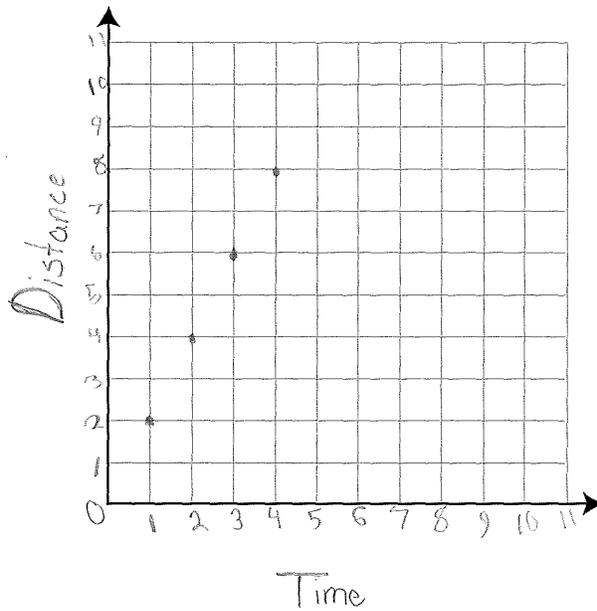
Score Point: 2

The response to Part A includes a graph with two missing axis labels (1.5). The response to Part B includes a partially correct rule (0.5).

Instructional Materials Question 41

A

Kerri's Hike



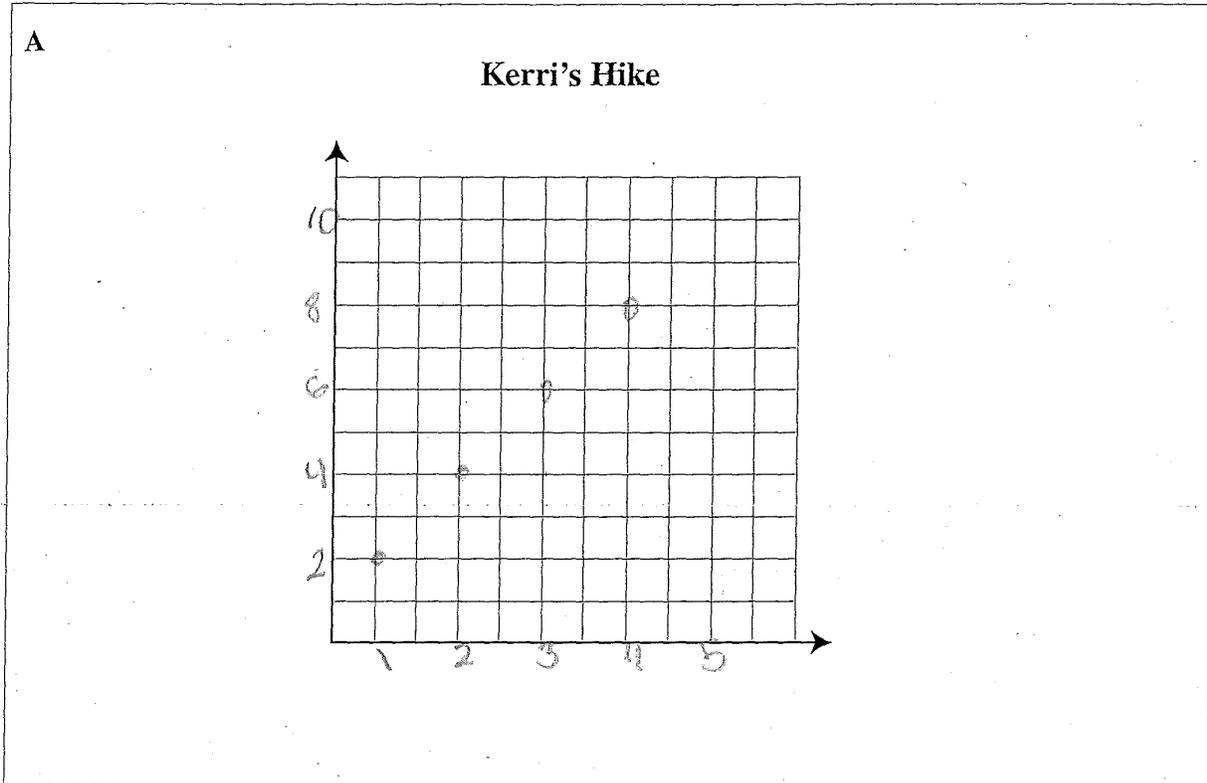
B

Well the time is the one that is
on the bottom. Then the Distance
is the one on the side.

Score Point: 2

The response to Part A includes a correct and complete graph (2.0). The response to Part B is incorrect (0).

Instructional Materials Question 41



B

The rule of the Kerri's Hike
 is $\times 2$ because $1 \times 2 = 2$ $2 \times 2 = 4$ $3 \times 2 = 6$ $4 \times 2 = 8$

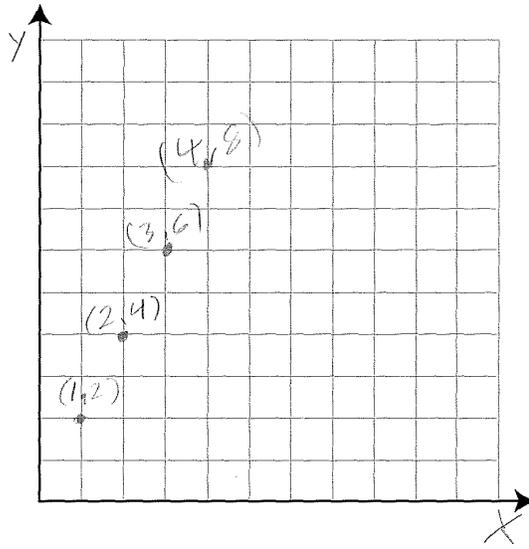
Score Point: 1

The response to Part A includes a graph with two missing axis labels and an incorrect horizontal scale (1.25). The response to Part B includes a partially correct rule (0.5).

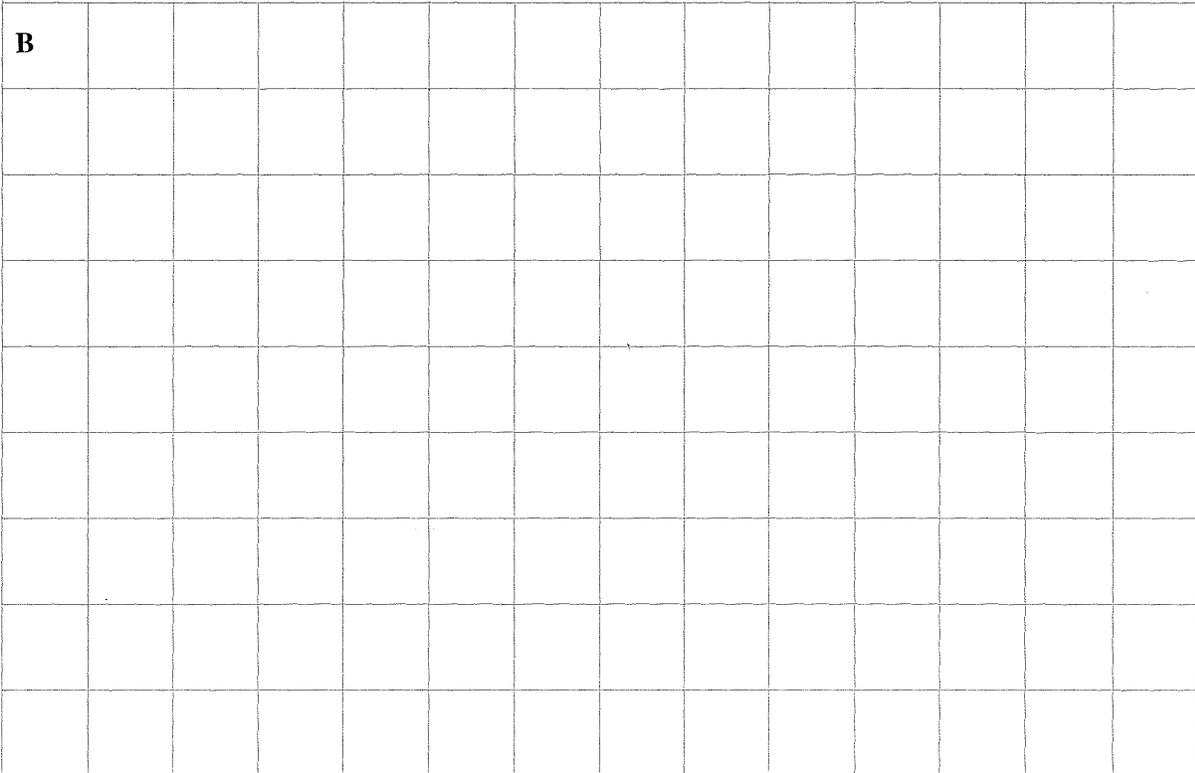
Instructional Materials Question 41

A

Kerri's Hike



B



Score Point: 1

The response to Part A includes a graph with two missing axis labels and two missing scales (1.0). The response to Part B is missing (0).

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42

All squares are trapezoids because **all** squares and **all** trapezoids have

- A at least one pair of parallel sides.
- B four sides of equal length.
- C two pairs of opposite angles with equal measures.
- D at least one right angle.

Scoring Notes:

Rationale A: correct

Rationale B: not all trapezoids have 4 sides of equal length

Rationale C: not true if trapezoid has 2 right angles

Rationale D: not all trapezoids have right angles

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Grade 5 Mathematics
NVACS: M_5.G.B3; M_5.G.B4

43

An incomplete sentence comparing the properties of squares and rhombi is shown below.

Because all squares are rhombi, all squares have _____ .

Which of these could complete the sentence and make it true? Select **all** that apply.

- A** 4 sides of equal length
- B** 4 angles of equal measure
- C** 4 right angles
- D** opposite angles of equal measure
- E** opposite sides of equal length

Scoring Notes:

Correct answers: A, D, E

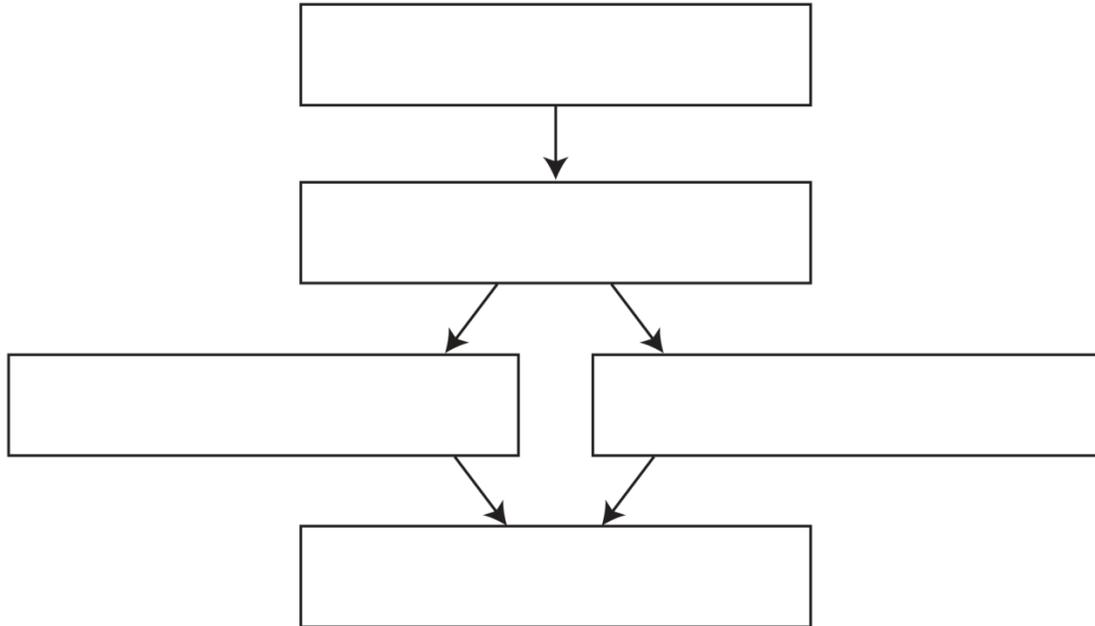
Rationale B: true for squares, but not because the squares are rhombi

Rationale C: true for squares, but not because the squares are rhombi

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NVACS: M_5.G.B4

44

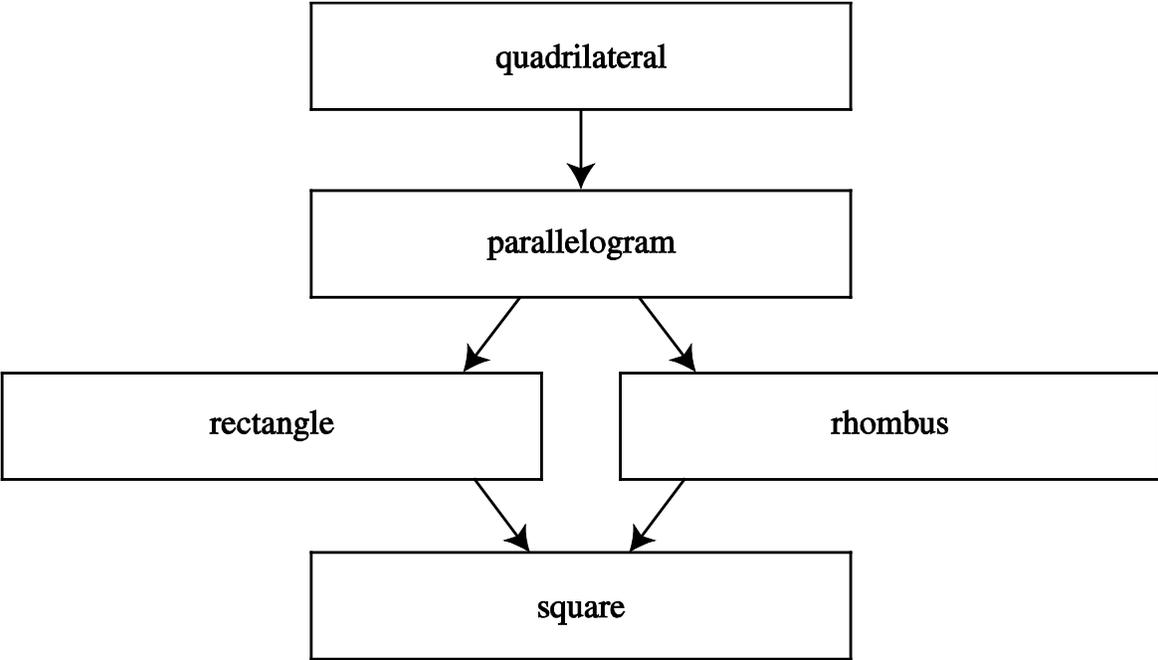
An empty hierarchy and a list of 2-dimensional figures are shown below.



- rectangle
- triangle
- quadrilateral
- circle
- square
- parallelogram
- rhombus

Write the name of one 2-dimensional figure from the list in each empty box to make a correct hierarchy, based on the properties of each figure. Some figures in the list may not belong in the hierarchy.

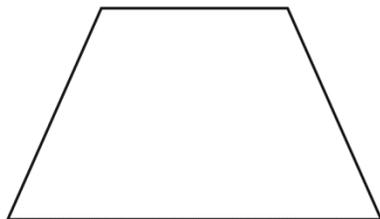
Scoring Notes:



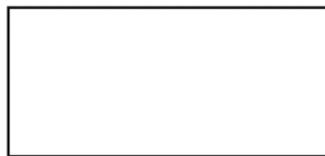
Nevada Instructional Materials Phase III
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NVACS: M_5.G.B4

45

Jim and Keira were each asked to draw an example of a quadrilateral. The shapes they drew are pictured below.



Jim's shape



Keira's shape

What type of quadrilateral **best** describes each student's shape? Write the answers in the blanks below.

Jim's shape: _____ Keira's shape: _____

Explain why both of the shapes are quadrilaterals but only one of the shapes is a parallelogram.

Write your response on the grid below.

Scoring Notes:

For this item, a full-credit response (2 points) includes

- two correct shapes, Jim: trapezoid and Keira: rectangle
AND
- explanation indicating why both shapes are quadrilaterals but only one of the shapes is a parallelogram

For example,

- Both shapes are quadrilaterals because they each have 4 straight sides. Only Keira's shape is a parallelogram because it has 2 pairs of opposite sides that are the same length. Jim's shape only has one pair of opposite sides that are the same length.

For this item, a partial-credit response (1 point) includes

- two correct shapes, Jim: trapezoid and Keira: rectangle
OR
- some explanation indicating why both shapes are quadrilaterals but only one of the shapes is a parallelogram

For this item, a no-credit response (0 points) includes none of the features of a full- or partial-credit response.



Dale A.R. Erquiaga

Superintendent of Public Instruction

Office of Assessment, Program Accountability, and Curriculum

775-687-9188

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