Tennessee Comprehensive Assessment Program / Mathematics

TCAP/CRA PILOT 2012

7

Task 2 : Orange Juice for Sale

Scoring Guide

Task 2. Orange Juice for Sale Task

Orange Juice	
6-ounce cup	
8-ounce cup	$1.20
16-ounce cup	

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Calculate and use a unit rate to justify your response.

1. Orange Juice Task Scoring Guide

The CCSS for Mathematical Content (2 points)

7.RP.1   Computes a unit rate associated with the problem. May partition a diagram, use   _____
simple division, or form a ratio and simplify to a numerator or denominator of one.

Interprets the work done appropriately as \$0.15 per 1 ounce or $6\frac{2}{3}$ ounces per 1

dollar.

7.RP.2b   Using any of the methods above, identifies the unit rate and recognizes how to use   _____
it in an equation to determine the cost of the 6-ounce and 16-ounce cups, either
with a proportion or with simple multiplication, e.g., \$0.15 x 6 = \$0.90 and
\$0.15 x 16 = \$2.40

Total Content Points _____

The CCSS for Mathematical Practices (5 points)

MP1   Determines a unit rate; responds to both parts of the problem.   _____

(MP1: Make sense of problems and persevere in solving them.)

MP2   Correctly abstracts the data from the context; forms ratios, table, or equations to solve   _____
the problem. Correctly notes the meaning of the results in the context of the problem.

(MP2: Reason abstractly and quantitatively.)

MP4   Writes number sentences describing the reasoning used, e.g.,   _____

$\dfrac{8\ \text{ounces}}{\$1.20} = \dfrac{4\ \text{ounces}}{\$0.60} = \dfrac{1\ \text{ounce}}{\$0.15}$ or \$0.15 x 6 = \$0.90 and \$0.15 x 16 = \$2.40, etc.

(MP4: Model with mathematics.)

MP6   Accurately scales, makes a table, writes correct equations, and labels quantities   _____
correctly.

(MP6: Attend to precision.)

MP7   Work specifically indicates that the student understands both unit rate and the   _____
multiplicative relationship that underlies proportional relationships for all values
associated with the relationship.

(MP7: Look for and make use of structure.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Analyze proportional relationships and use them to solve real-world and mathematical problems.
7.RP.1   Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. *For example, if a person walks ½ mile in each ¼ hour, compute the unit rate as the complex fraction ½/¼ miles per hour, equivalently 2 miles per hour.*

Analyze proportional relationships and use them to solve real-world and mathematical problems.

Recognize and represent proportional relationships between quantities.
7.RP.2b   Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

The CCSS for Mathematical Practices*

1. Make sense of problems and persevere in solving them.

2. Reason abstractly and quantitatively.

3. Construct viable arguments and critique the reasoning of others.

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

*Gray text indicates Mathematical Practices not addressed in this task.

Students' responses to a mathematical task provide evidence of what they understand and are able to do in relation to the standards and practices. Across tasks, this cumulative evidence shows students' understanding and abilities within a domain. When students do not respond completely to all parts of a task, they provide insufficient evidence of their mathematical understanding and abilities and therefore do not fully demonstrate the expectations of the standards and practices aligned with that task.

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$\frac{8}{1} = \frac{1.20}{X}$$

$$\frac{8x}{8} = \frac{1.20}{8}$$

$$x = 0.15$$

6-ounce: $0.90
16-ounce: $2.40

$$\begin{array}{r} 0.15 \\ \times\ \ 6 \\ \hline \$0.90 \end{array}$$

$$\begin{array}{r} 0.15 \\ \times\ \ 16 \\ \hline \$2.40 \end{array}$$

Guide 1   Litho 70270

Total Content Points: 2   (7.RP.1, 7.RP.2b)

Total Practice Points: 5   (MP1, MP2, MP4, MP6, MP7)

The student calculates a unit rate (7.RP.1) and responds to both parts of the problem (MP1). The student shows how to use the unit rate in equations to solve the problem (7.RP.2b, MP2), has number sentences describing the reasoning used (MP4), and has correct equations with quantities labeled correctly (MP6). The work shown specifically indicates that the student understands both unit rate and the multiplicative relationship that underlies proportional relationships for all values associated with the relationship (MP7).

Total Awarded Points: 7 out of 7

Task 2. Orange Juice for Sale Task

> **Orange Juice**
>
> 6-ounce cup
>
> 8-ounce cup　　　　$1.20
>
> 16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$\frac{8x}{8} = \frac{1.20}{8}$$

$$\frac{18.0}{1.20} = \frac{1}{x} \qquad x = \$0.15$$

$$\begin{array}{r} 0.15 \\ \times \quad 6 \\ \hline 0.90 \end{array}$$

6 ounce = $0.90
16 ounce = $2.40

$$\begin{array}{r} \$0.15 \\ \times \quad 16 \\ \hline \$2.40 \end{array}$$

Guide 2   Litho 70196

Total Content Points: 2   (7.RP.1, 7.RP.2b)

Total Practice Points: 5   (MP1, MP2, MP4, MP6, MP7)

This response shows determination of a unit rate labeled "*x*" (7.RP.1). The student responds to both parts of the problem (MP1), provides equations showing how to solve the problem using the given unit rate (7.RP.2b, MP2), gives number sentences describing the reasoning used (MP4), and has correct equations with quantities labeled correctly (MP6). The student's work specifically indicates understanding of both unit rate and the multiplicative relationship that underlies proportional relationships for all values associated with the relationship (MP7).

Total Awarded Points: 7 out of 7

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

6    $ 0.90
8    $1.20
16   $ 2.40

6.7

ounces	6	8	16
price	.90	1.120	2.40
	6.7	6.7	6.7

6 ounce = 90 ¢
16 ounce = $2.40

Guide 3 Litho 70106

Total Content Points: 2   (7.RP.1, 7.RP.2b)

Total Practice Points: 4   (MP1, MP2, MP6, MP7)

The student calculates the unit rate (7.RP.1) and responds to both parts of the problem (MP1). This student constructs a table to solve the problem (MP2) that demonstrates the process of using the unit rate to find the prices (7.RP.2b). The table is accurate, and the quantities in the response are appropriately labeled (MP6). The student specifically indicates understanding of both unit rate and the multiplicative relationship that underlies proportional relationships for all values associated with the relationship (MP7). The response does not contain a number sentence describing the reasoning used (no credit for MP4).

Total Awarded Points: 6 out of 7

Task 2. Orange Juice for Sale Task

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$1.20 ÷ 8 = 0.15, so it is $0.15/oz. If you multiply that by 6 you get 0.90, so it is 90¢ for a 6-ounce cup. IF you multiply $0.15 by 16 you get 2.4, so it is $2.40 for a 16-ounce cup.

Guide 4   Litho 70325

Total Content Points: 2   (7.RP.1, 7.RP.2b)

Total Practice Points: 4   (MP1, MP2, MP6, MP7)

This response shows determination of the unit rate (7.RP.1), and the student responds to both parts of the problem, explaining how to use the unit rate to find the prices (7.RP.2b, MP1). The student uses an equation to solve the problem (MP2), which is correct, with the quantity labeled correctly (MP6), and the work shown specifically indicates understanding of both unit rate and the multiplicative relationship that underlies proportional relationships for all values associated with the relationship (MP7). The response does not contain a number sentence describing the reasoning used (no credit for MP4).

Total Awarded Points: 6 out of 7

Task 2. Orange Juice for Sale Task

Orange Juice

6-ounce cup $.90

8-ounce cup $1.20

16-ounce cup $2.40

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

The 6-ounce cup is 90¢ and the 16-ounce cup is $2.40. I divided $1.20 by 8 and got .15, so I multiplied 6 x .15 and 16 x .15 and got the prices.

Guide 5   Litho 70076

Total Content Points: 2   (7.RP.1, 7.RP.2b)

Total Practice Points: 3   (MP1, MP2, MP7)

This response shows determination of the unit rate (7.RP.1). The student responds to both parts of the problem (MP1), has correctly abstracted the data from the context (MP2), and has work that specifically indicates understanding of both unit rate and the multiplicative relationship that underlies proportional relationships for all values associated with the relationship (MP7). The response does not contain complete number sentences describing the reasoning used (no credit for MP4), and the precision of the response is limited by the lack of equations (no credit for MP6). The response does clearly demonstrate how to use a unit rate to complete the task (7.RP.2b).

Total Awarded Points: 5 out of 7

Task 2. Orange Juice for Sale Task

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$6/8 = x/1.20 \qquad 8/16 = 1.20/x$$

$$8x = 7.2 \qquad\qquad 19.2 = 8x$$
$$x = .9 \qquad\qquad\qquad 2.4 = x$$

cost of
6-ounce
    cup: $0.90
cost of
16-ounce
    cup: $2.40

Guide 6   Litho 70105

Total Content Points: 0

Total Practice Points: 3   (MP2, MP4, MP6)

This student has correctly used equations to solve the problem (MP2), has number sentences describing the reasoning used (MP4), and has correct equations with quantities labeled correctly (MP6). The student has not given a unit rate for the cost of the orange juice (no credit for 7.RP.1). Although the work shown is accurate, the student does not use a unit rate to justify the answer as required by the task (no credit for both 7.RP.2b and MP1). The response also does not have work specifically indicating that the student understands both unit rate and the multiplicative relationship (no credit for MP7).

Total Awarded Points: 3 out of 7

Task 2. Orange Juice for Sale Task

```
                    Orange Juice

        6-ounce cup

        8-ounce cup              $1.20

        16-ounce cup
```

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

16 ounce cup—$2.40   6 ounce cup—.90¢

$$\frac{1.20}{8} \nearrow \frac{x}{16}$$

$$\frac{19.2}{8} = \frac{8x}{8}$$

$$2.40 \cdot 9$$

$$\frac{1.20}{8} \nearrow \frac{x}{6}$$

$$\frac{7.2}{8} = \frac{8x}{8}$$

$$.9 = x$$

Guide 7   Litho 70036

Total Content Points: 0

Total Practice Points: 3   (MP2, MP4, MP6)

This student has correctly used equations to solve the problem (MP2), has number sentences describing the reasoning used (MP4), and has correct equations with quantities labeled correctly (MP6). The response does not have a determined unit rate (no credit for 7.RP.1), and the student does not use a unit rate to justify the answer as required by the task (no credit for both 7.RP.2b and MP1). There is no work specifically indicating that the student understands both unit rate and the multiplicative relationship (no credit for MP7).

Total Awarded Points: 3 out of 7

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$\frac{8}{1.20} = \frac{6}{x}$$

$$\frac{8x}{8} \qquad \frac{7.2}{8}$$

$$\boxed{6 \, oz = .9\cancel{\$}}$$

$$\frac{8}{1.20} = \frac{16}{x}$$

$$\frac{8x}{8} \qquad \frac{19.2}{8}$$

$$\boxed{16 \, oz \, \$2.4}$$

$$\frac{16}{2.4} = \frac{6}{.9}$$

$$14.4 = 14.4$$

Guide 8   Litho 70187

Total Content Points: 0

Total Practice Points: 2   (MP2, MP4)

This student has correctly used equations to solve the problem (MP2) and has number sentences describing the reasoning used (MP4). The student incorrectly labels the cost for the 6-ounce cup as .9 cents (no credit for MP6), and does not determine the unit rate (no credit for 7.RP.1). The response does not have any work using a unit rate to justify the answer given (no credit for 7.RP.2b, no credit for MP1). Therefore, there is no indication that the student understands both unit rate and the multiplicative relationship (no credit for MP7).
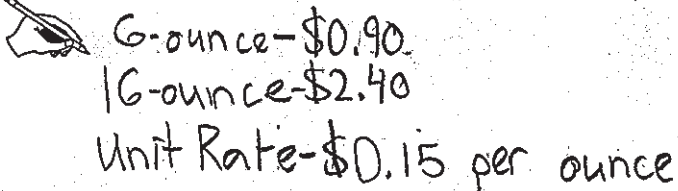
Total Awarded Points: 2 out of 7

Orange Juice

6-ounce cup

8-ounce cup $1.20

16-ounce cup

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

6-ounce—$0.90
16-ounce—$2.40
Unit Rate—$0.15 per ounce

Guide 9   Litho 70019

Total Content Points: 1   (7.RP.1)

Total Practice Points: 1   (MP1)

This response has a correctly determined unit rate (7.RP.1). Although both correct total costs have been found, as well as the unit rate (MP1), the student does not show any work or describe a process used to find the correct answers (no credit for 7.RP.2b).Lacking an explanation or evidence of a method (no credit for MP2), the response does not show understanding of the multiplicative nature that underlies proportional relationships (no credit for MP7). The response does not contain a number sentence describing the reasoning used (no credit for MP4). The response's precision is also limited by the lack of work shown (no credit for MP6).

Total Awarded Points: 2 out of 7

```
                  Orange Juice

6-ounce cup

8-ounce cup            $1.20

16-ounce cup
```

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$\begin{array}{r} 6 \\ \times 30 \\ \hline 90 \end{array}$$

¢30 = 2 ounces

The 6 ounce cup would be 90 cents because every 2 ounces is 30 cents. and 3 X 30 = 90.
The 16 ounce drink would be $2.40 because it is exactly 2X as big as the 8 ounce cup so double the price

Guide 10   Litho 70078

Total Content Points: 0

Total Practice Points: 1   (MP2)

This student has correctly abstracted the data from the context and has an equation to solve the problem (MP2). Because the cost is calculated per two ounces the unit rate is not correctly determined (no credit for 7.RP.1) nor used to justify the answer (no credit for both 7.RP.2b and MP1). The response also does not use correct number sentences to describe all of the reasoning used (no credit for MP4), does not have correct equations with quantities labeled correctly (no credit for MP6), and does not have work specifically indicating that the student understands both unit rate and the multiplicative relationship (no credit for MP7).

Total Awarded Points: 1 out of 7

Task 2. Orange Juice for Sale Task

Orange Juice	
6-ounce cup	
8-ounce cup	$1.20
16-ounce cup	

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

$$\frac{8}{1.20} \quad \frac{6}{X} \quad \frac{16}{X}$$

6 oz = 90¢   16 oz. $2.40

Guide 11   Litho 70154

Total Content Points: 0

Total Practice Points: 1   (MP2)

This response shows use of ratios to solve the problem (MP2). The student has not given a unit rate for the cost of the orange juice (no credit for 7.RP.1), and the student does not justify the answers based on a unit rate (no credit for both 7.RP.2b and MP1). The student does not provide number sentences to describe the reasoning used (no credit for MP4), and does not provide correct equations with quantities labeled correctly (no credit for MP6). No work specifically indicates that the student understands both unit rate and the multiplicative relationship (no credit for MP7).
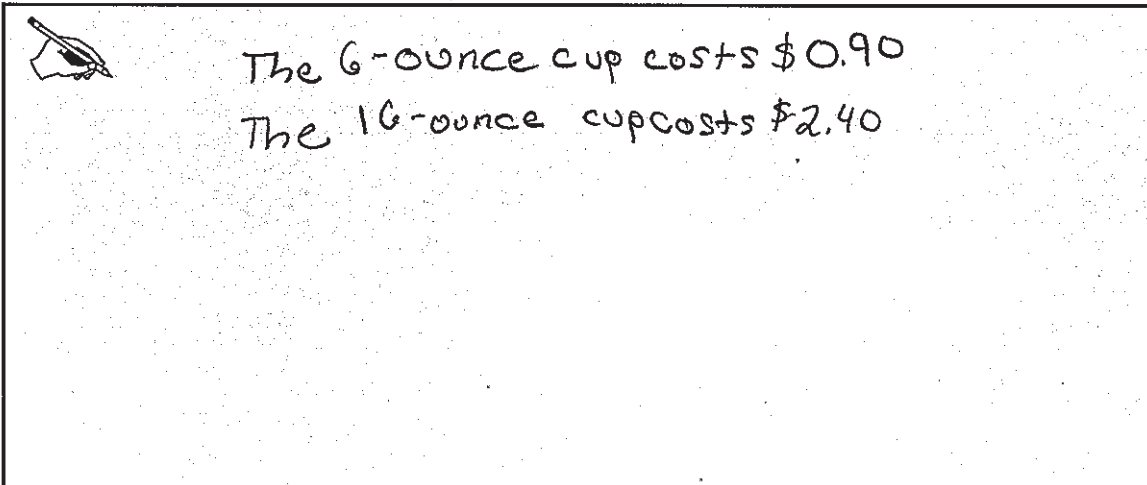
Total Awarded Points: 1 out of 7

Task 2. Orange Juice for Sale Task

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┌─────────────────────────────────┐
│          Orange Juice           │
│                                 │
│   6-ounce cup                   │
│                                 │
│   8-ounce cup          $1.20    │
│                                 │
│   16-ounce cup                  │
└─────────────────────────────────┘
```

The sign above shows the cost of orange juice at a neighborhood store.

If the costs of the 6- and 16-ounce cups are in proportion with the 8-ounce cup, what is the cost of the 6-ounce cup and what is the cost of the 16-ounce cup? Justify your response using a unit rate.

> The 6-ounce cup costs $0.90
> The 16-ounce cupcosts $2.40

Guide 12   Litho 70009

Total Content Points: 0

Total Practice Points: 0

Although both correct values are given, the student has not determined a unit rate (no credit for 7.RP.1) and has not explained or demonstrated the process for finding the given values (no credit for both 7.RP.2b and MP1). With no work shown or described, it cannot be determined what process the student has used to answer the question (no credit for MP2), or whether the student understands the multiplicative nature that underlies proportional relationships (no credit for MP7). There are no correct equations with quantities labeled (no credit for MP6) and no number sentences describing the reasoning used (no credit for MP4).

Total Awarded Points: 0 out of 7