

Tennessee Comprehensive Assessment Program / Mathematics

# TCAP/CRA PILOT 2012

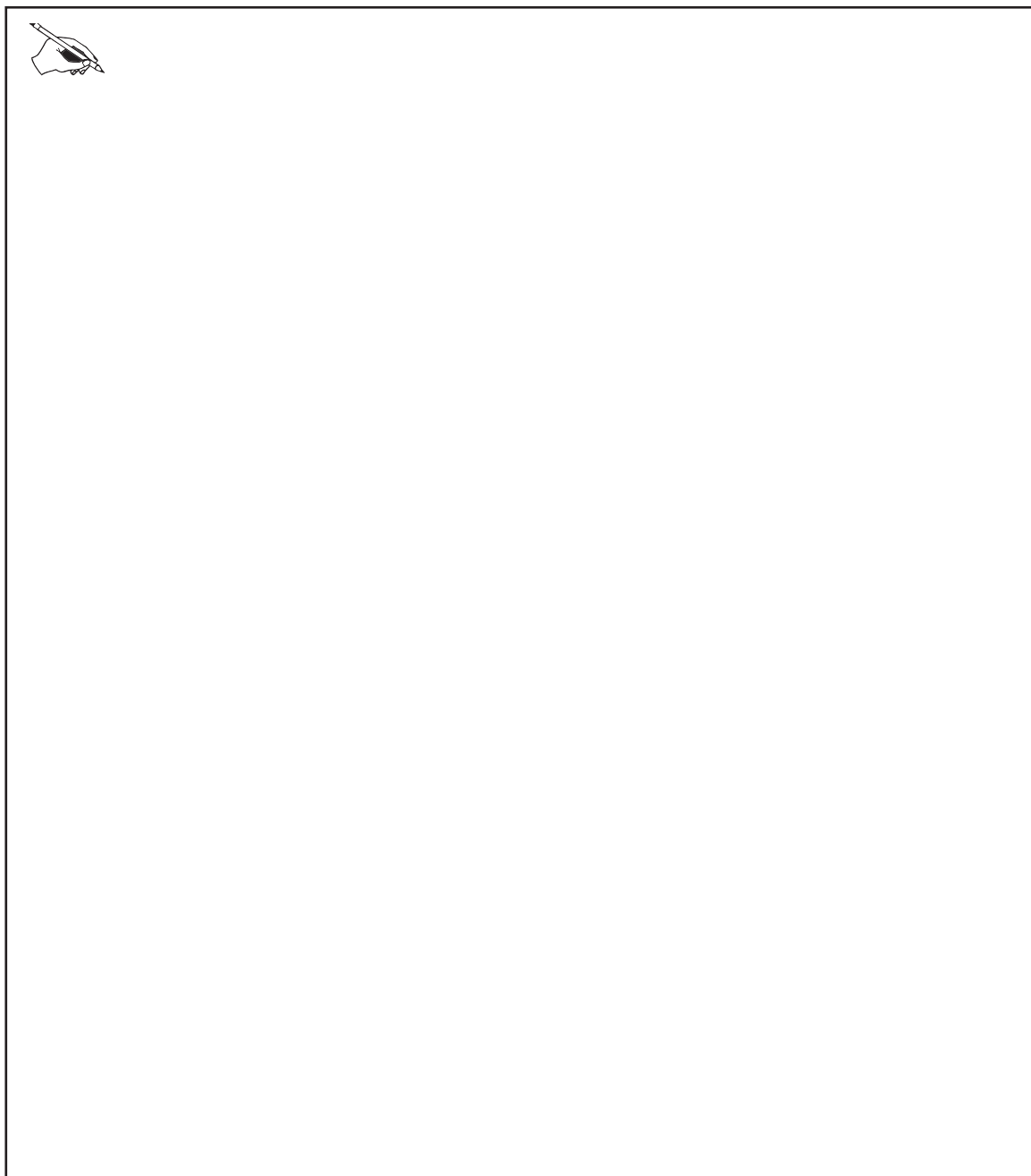


## Task 4 : The Cake Shop Scoring Guide

#### Task 4. The Cake Shop Task

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

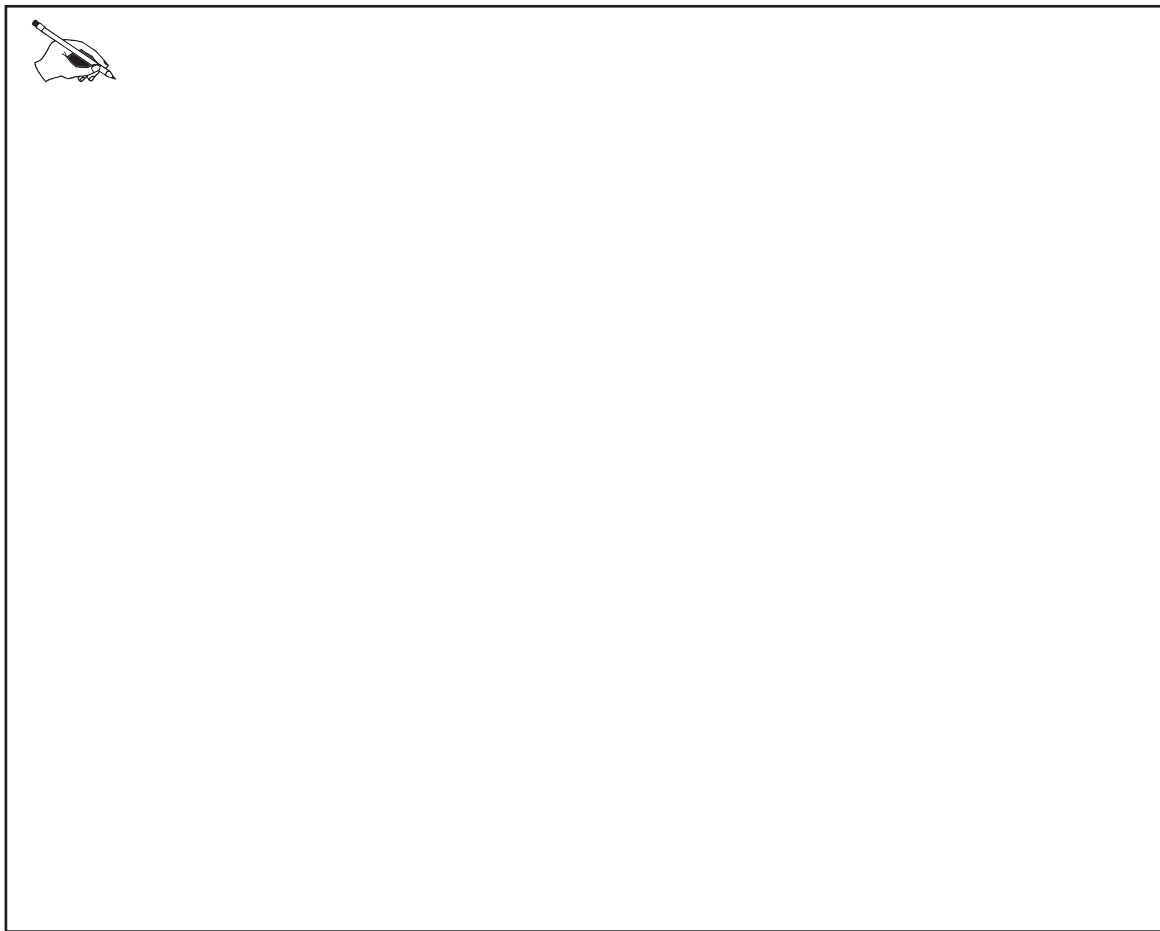
- a. Lisa buys  $\frac{2}{6}$  of each type of cake. How much cake does she have altogether?  
Show a diagram and write an equation that shows and describes Lisa's cake.



Lisa says:

I can figure out the number of pieces that I have because I know that each piece is  $\frac{1}{6}$  of a cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.



#### 4. The Cake Shop Task Scoring Guide

##### The CCSS for Mathematical Content (2 points)

4.NF.4a Student recognizes that  $\frac{2}{6}$  is  $\frac{1}{6} + \frac{1}{6}$  or  $2 \times \frac{1}{6}$ . \_\_\_\_\_

4.NF.4c Student identifies the product of  $4 \times \frac{2}{6}$ . Work may show: \_\_\_\_\_

-  $\frac{2}{6}$  added four times to arrive at  $\frac{8}{6}$  (or  $1 \frac{2}{6}$  or  $1 \frac{1}{3}$ ).

-  $\frac{2}{6} \times 4 = \frac{8}{6}$ .

**Total Content Points** \_\_\_\_\_

##### The CCSS for Mathematical Practices (5 points)

MP1 Student makes sense of and completes all aspects of the task. \_\_\_\_\_  
(MP1: Make sense of problems and persevere in solving them.)

MP2 Student writes equations and provides labels that indicate the meaning of the amounts as they relate to the context of the problem. \_\_\_\_\_  
(MP2: Reason abstractly and quantitatively.)

MP3 Student convinces the reader that  $4 \times \frac{2}{6}$  is the same as  $8 \times \frac{1}{6}$ . The argument may \_\_\_\_\_  
show four pieces of  $\frac{2}{6}$  is  $\frac{8}{6}$ . When only  $\frac{1}{6}$  is considered, then double the amount is  
needed because  $\frac{2}{6}$  is double  $\frac{1}{6}$ .  
(MP3: Construct viable arguments and critique the reasoning of others.)

MP4 Representation indicates an understanding of the amount of cake bought by Lisa. \_\_\_\_\_  
The equation indicates an understanding of alternative ways of thinking about  
 $4 \times \frac{2}{6}$ .  
(MP4: Model with mathematics.)

MP6 Accurate and precise work is shown. \_\_\_\_\_

- Work indicates the product of  $4 \times \frac{2}{6}$  as  $\frac{8}{6}$  or  $1 \frac{2}{6}$  or  $1 \frac{1}{3}$ .

- Work identifies  $8 \times \frac{1}{6}$  as the equivalent expression related to  $4 \times \frac{2}{6}$ .

(MP6: Attend to precision.)

**Total Practice Points** \_\_\_\_\_

**Total Awarded Points** \_\_\_\_\_

## The CCSS for Mathematical Content Addressed in This Task

**Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.**

**Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.**

4.NF.4a Understand a fraction  $a/b$  as a multiple of  $1/b$ . For example, use a visual fraction model to represent  $5/4$  as the product  $5 \times (1/4)$ , recording the conclusion by the equation  $5/4 = 5 \times (1/4)$ .

4.NF.4c Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat  $3/8$  of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

## 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.

**Task 4. The Cake Shop Task**

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.


- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.

$\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} = 1 \frac{2}{6}$  so she has  
 $1 \frac{2}{6}$  of cake

Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 because when you say  $4 \times 2$  that = 8  
so  $8 \times \frac{1}{6}$  is like saying you have  
8 pieces of cake that are  $\frac{1}{6}$   
 $\frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} \frac{1}{6} = 1 \frac{2}{3}$   
the answer is  $1 \frac{2}{3}$



REVIEW YOUR WORK IF YOU HAVE TIME.



Guide 1

Litho 40159

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 5 (MP1, MP2, MP3, MP4, MP6)

The student correctly identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times (4.NF.4c).

The student clearly recognizes that 4 pieces equal to  $\frac{2}{6}$  are equivalent to 8 pieces equal to  $\frac{1}{6}$  (4.NF.4a). The student makes sense of and completes all aspects of the task (MP1).

The response contains equations and the labels, such as “ $1 \frac{2}{6}$  of cake,” that indicate the meaning of the amounts as they relate to the context of the problem (MP2). The student provides a convincing argument by stating, “ $8 \times \frac{1}{6}$  is lik saying you have 8 peices of

cake that are  $\frac{1}{6}$ .” Further proof of the validity of this statement can be seen in the student’s addition problem (MP3). The response includes a drawing representing the amount of cake bought by Lisa (MP4), and the work is accurate and precise (MP6).

Total Awarded Points: 7 of 7

**Task 4. The Cake Shop Task**

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.

cake

$$\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} =$$

1 and  $\frac{2}{6}$  of cake


or

$\frac{6}{6}$

Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 Lisa can think this way because  $\frac{2}{6} \times 4$  is equal to  $\frac{1}{6} \times 8$  because you split one number in half and doubled the other.

example:  
 $4 \times 16 = 64$   
double split  
 $8 \times 8 = 64$



REVIEW YOUR  
WORK IF YOU  
HAVE TIME.

Guide 2

Litho 40369

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 5 (MP1, MP2, MP3, MP4, MP6)

The student correctly identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times (4.NF.4c).

The student clearly recognizes that 4 pieces equal to  $\frac{2}{6}$  are equivalent to 8 pieces equal to

$\frac{1}{6}$  (4.NF.4a). The student makes sense of all aspects of the task (MP1). The student

constructs equations correctly and provides labels, such as “1 and  $\frac{2}{6}$  of cake,” that indicate the meaning of the amount as it relates to the context of the problem (MP2). The

student constructs an argument convincing the reader that  $4 \times \frac{2}{6}$  is the same as

$8 \times \frac{1}{6}$  by stating, “you split one number in half and doubled the other.” The example

provided by the student is further proof of the validity of this concept (MP3). The response includes a representation of the amount of cake bought by Lisa (MP4), and the work is accurate and precise (MP6).

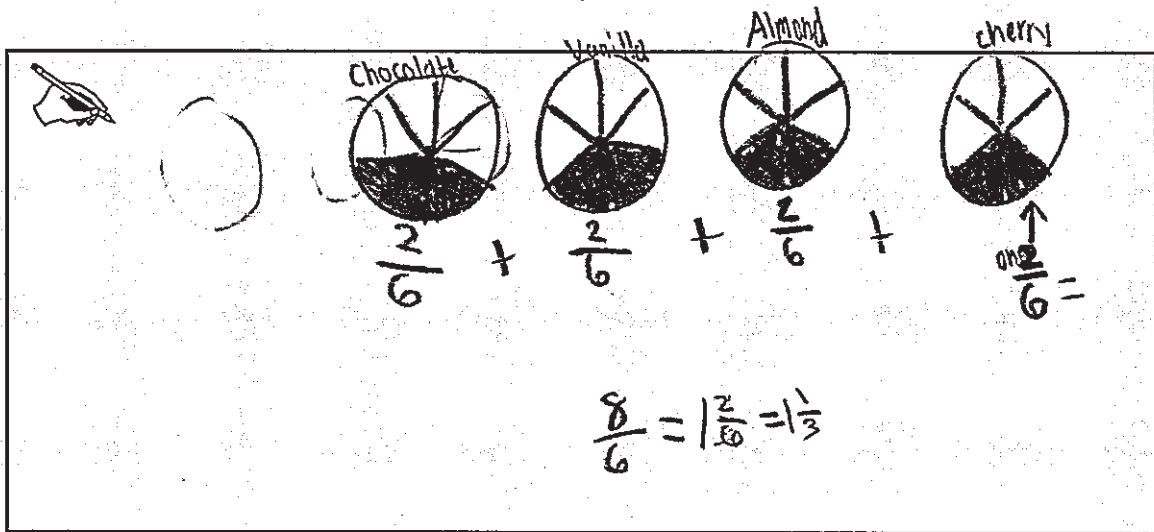
Total Awarded Points: 7 of 7

### Task 4. The Cake Shop Task

### Guide 3a

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.


- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.



Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 Because  $4 \times 2 = 8 \times \frac{1}{6} = 1\frac{1}{3}$ .



REVIEW YOUR  
WORK IF YOU  
HAVE TIME.

Guide 3

Litho 40312

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 2 (MP2, MP3)

The student correctly identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times to get an answer of  $1\frac{2}{6}$  (4.NF.4c). The student demonstrates that 8 pieces, each of which is  $\frac{1}{6}$  in size, are equivalent to 4 pieces, each of which is  $\frac{2}{6}$  in size, by stating “ $4 \times 2 = 8 \times \frac{1}{6} = 1\frac{1}{3}$ ” (4.NF.4a). The student writes an equation and provides a diagram with labels to indicate the meaning of the amounts as they relate to the context of the problem (MP2).

The response constructs a viable argument indicating that  $4 \times \frac{2}{6}$  is the same as  $8 \times \frac{1}{6}$


(MP3). The response, however, has a flawed equation,  $4 \times 2 = 8 \times \frac{1}{6} = 1\frac{1}{3}$  (no credit for MP4), and lacks a clear explanation in part b, which demonstrates a lack of precision (no credit for MP6) and an inability to make sense of all aspects of the task (no credit for MP1).

Total Awarded Points: 4 of 7

## Task 4. The Cake Shop Task

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.


 Lisa would have  $1\frac{2}{6}$  of cake since she bought 4 and each piece equals  $\frac{2}{6}$ .

$$4 \times \frac{2}{6} = 1\frac{2}{6}$$



I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 because she bought 4 pieces of cake. Then she took the 2 from the numerator and changed it into a 1 and kept the denominator a 6 so if you do  $4 \times 2 \times \frac{1}{6} = 1 \frac{2}{6}$  just like the first time when it was  $4 \times \frac{2}{6} = 1 \frac{2}{6}$  and you can simplify it into  $1 \frac{1}{3}$ .



REVIEW YOUR  
WORK IF YOU  
HAVE TIME.

Guide 4

Litho 40288

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 2 (MP2, MP3)

The student correctly multiplies a fraction,  $\frac{2}{6}$ , by a whole number, 4, to get a correct answer of  $1\frac{2}{6}$  (4.NF.4c). The student understands that  $\frac{2}{6}$  is equal to doubling  $\frac{1}{6}$

(4.NF.4a). The student includes an equation and provides labels, such as “ $1\frac{2}{6}$  of cake,” that indicate the meaning of the amounts as they relate to the context of the problem

(MP2). The student constructs a viable argument recognizing that  $\frac{1}{6}$  is half of  $\frac{2}{6}$  (MP3).

The response, however, does not include diagrams (no credit for MP4), indicating a failure to persevere in solving all aspects of the task (no credit for MP1). The student’s explanation in part b is unclear and lacks precision (no credit for MP6).

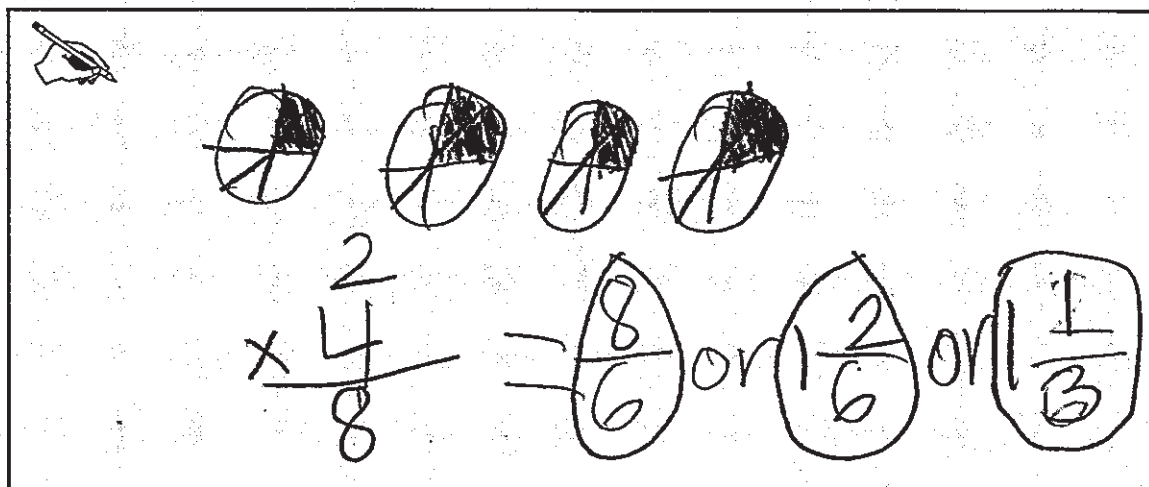
Total Awarded Points: 4 of 7

#### Task 4. The Cake Shop Task

Guide 5a

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.



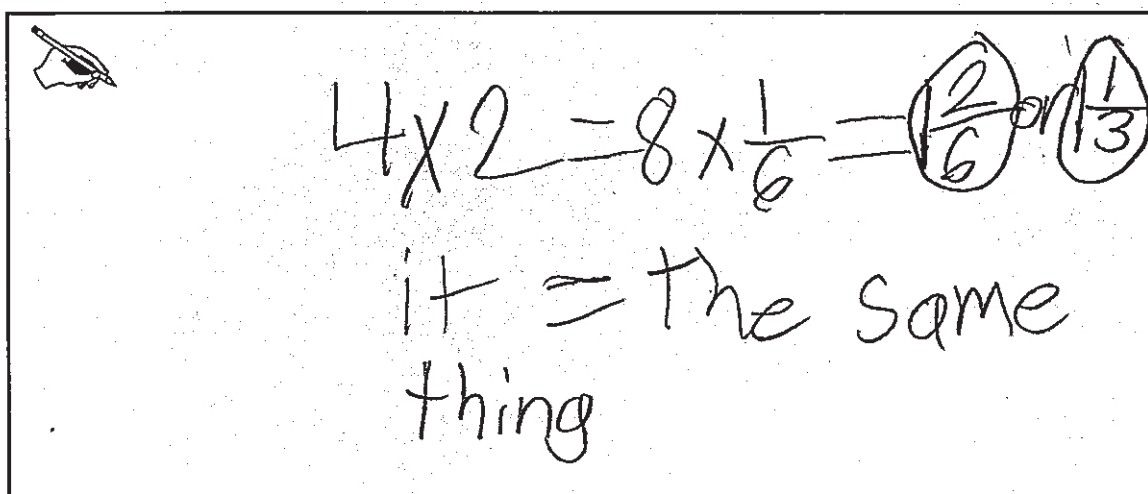
The diagram shows four circles, each divided into three equal parts with two parts shaded. Below the circles is a multiplication problem:  $\frac{2}{6} \times 4 = \frac{8}{6}$  or  $1\frac{2}{6}$  or  $1\frac{1}{3}$ .

Lisa claims:

Guide 5b

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.



$4 \times 2 = 8 \times \frac{1}{6} = \frac{2}{6} \text{ or } \frac{1}{3}$   
it = the same thing



REVIEW YOUR  
WORK IF YOU  
HAVE TIME.

Guide 5

Litho 40231

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 1 (MP3)

The student correctly recognizes that the product of  $4 \times \frac{2}{6}$  is  $1 \frac{2}{6}$  (4.NF.4.c). The student's work demonstrates the understanding that 8 pieces, each of which is  $\frac{1}{6}$  in size, are equivalent to 4 pieces, each of which is  $\frac{2}{6}$  in size, by stating " $4 \times 2 = 8 \times \frac{1}{6} = 1 \frac{2}{6}$  or  $1 \frac{1}{3}$  it = the same thing" (4.NF.4a). The student provides a convincing argument to support Lisa's claim (MP3). The response fails to provide labels to indicate the meaning of the amounts as they relate to the context of the problem (no credit for MP2). Additionally, the student does not write an equation for part a (no credit for MP4) and constructs a flawed equation in part b, " $4 \times 2 = 8 \times \frac{1}{6} = 1 \frac{2}{6}$ " (no credit for MP6), indicating a failure to make sense of and persevere in solving all aspects of the task (no credit for MP1).

Total Awarded Points: 3 of 7

**Task 4. The Cake Shop Task**

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.


The diagram shows a hand-drawn table with four columns: Vanilla, Chocolate, Almond, and Cherry. Each column contains the fraction  $\frac{2}{6}$ . To the right of the table, the equation  $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6}$  is written and circled. A small drawing of a hand holding a pencil is in the top left corner of the diagram area.

Vanilla	Chocolate	Almond	Cherry
$\frac{2}{6}$	$\frac{2}{6}$	$\frac{2}{6}$	$\frac{2}{6}$

$\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6}$

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 Because  $4 \times 2 = 8$  and  $8 \times \frac{1}{6} = 1\frac{2}{6}$  which is equal to  $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6}$ .



Guide 6

Litho 40114

Total Content Points: 2 (4.NF.4a, 4.NF.4c)

Total Practice Points: 1 (MP3)

Although the product of  $4 \times \frac{2}{6}$  is not stated in part a, the student indicates  $\frac{2}{6}$  added 4 times and provides the correct answer of  $1\frac{2}{6}$  in response to part b (4.NF.4c). The student demonstrates the understanding that 8 pieces, each of which is  $\frac{1}{6}$  in size, are equivalent to 4 pieces, each of which is  $\frac{2}{6}$  in size, by stating, “ $8 \times \frac{1}{6} = 1\frac{2}{6}$  which is equal to  $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6}$ ” (4.NF.4a). The student provides a convincing argument to support Lisa’s claim and demonstrates that the product of  $4 \times \frac{2}{6}$  is equivalent to  $8 \times \frac{1}{6}$  (MP3). The response contains equations, but does not contain appropriate diagrams (no credit for MP4), and does not include the labels necessary to indicate the meaning of the amounts in the context of the problem (no credit for MP2). This indicates a lack of precision (no credit for MP6) and an inability to make sense of and persevere in solving all aspects of the task (no credit for MP1).

Total Awarded Points: 3 of 7



**Task 4. The Cake Shop Task**

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.

chocolate vanilla cherry almond

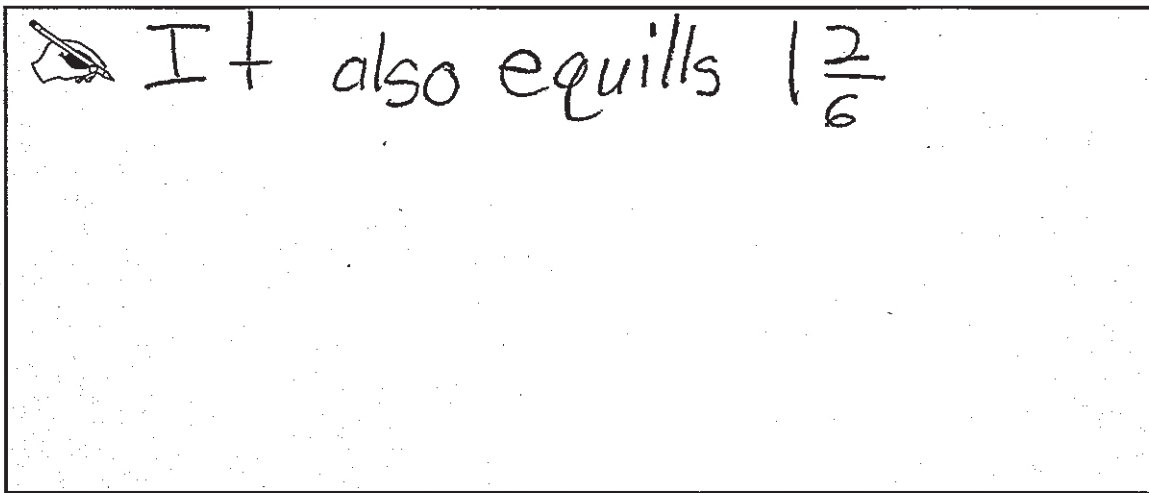
$$\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} = 1\frac{2}{6}$$

Lisa claims:

Guide 7b

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.



REVIEW YOUR  
WORK IF YOU  
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Guide 7

Litho 40351

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 2 (MP2, MP4)

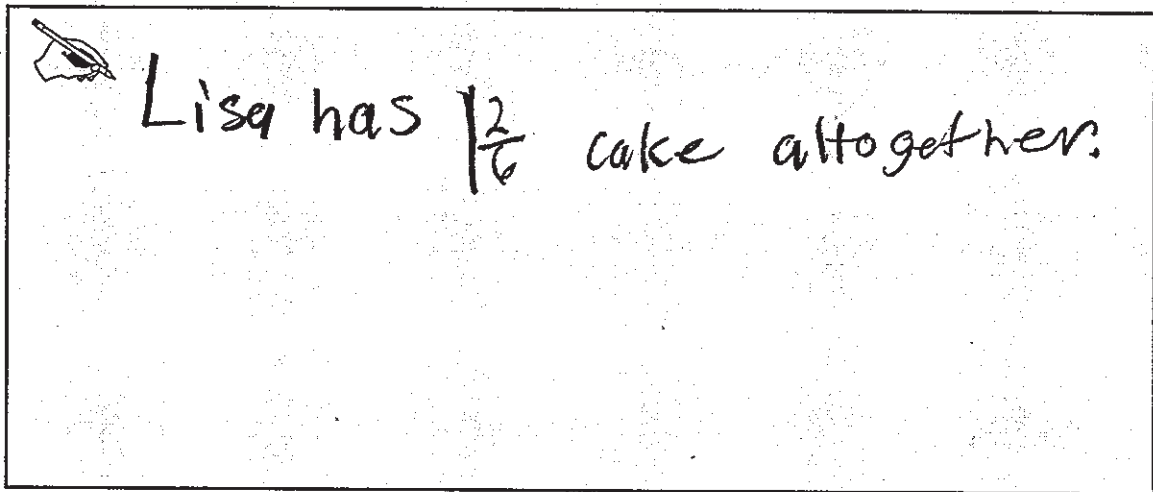
The student correctly identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times to arrive at  $1\frac{2}{6}$  (4.NF.4c). The student's assertion that "it also equals  $1\frac{2}{6}$ " fails to demonstrate an understanding of fraction  $\frac{a}{b}$  as a multiple of  $\frac{1}{b}$  (no credit for 4.NF.4a). The student writes an equation, draws a diagram, and correctly labels the diagram, indicating an understanding of the amount of cake bought by Lisa (MP2, MP4). There is no evidence to suggest that the student understands that 8 pieces that are each  $\frac{1}{6}$  in size are equivalent to 4 pieces that are each  $\frac{2}{6}$  in size (no credit for MP3). This indicates a lack of precision (no credit for MP6) and an inability to make sense of all aspects of the task (no credit for MP1).

Total Awarded Points: 3 of 7

## Task 4. The Cake Shop Task

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.




$$\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} = 1\frac{2}{6}$$

Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 Lisa can think of it this way because  $4 \times 2 \times \frac{1}{6} = \frac{8}{6}$  so she would get the same amount of cake that she had before.



REVIEW YOUR  
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Guide 8

Litho 40029

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 1 (MP2)

The student correctly identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times to arrive at  $1\frac{2}{6}$  (4.NF.4c). The student's response to part b is inadequate because it simply reiterates Lisa's expression without recognizing that 4 pieces that are each  $\frac{2}{6}$  in size are equivalent to 8 pieces that are each  $\frac{1}{6}$  in size (no credit for 4.NF.4a). The student receives credit for writing an equation ( $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6} = 1\frac{2}{6}$ ) and correctly labeling the meaning of the amount, "1  $\frac{2}{6}$  cake," as it relates to the context of the problem (MP2). The student does not include a diagram, and there is no evidence to suggest that the student understands that 8 pieces that are each  $\frac{1}{6}$  in size are equivalent to 4 pieces that are each  $\frac{2}{6}$  in size (no credit for MP4, no credit for MP3). This indicates a lack of precision (no credit for MP6) and an inability to make sense of all aspects of the task (no credit for MP1).

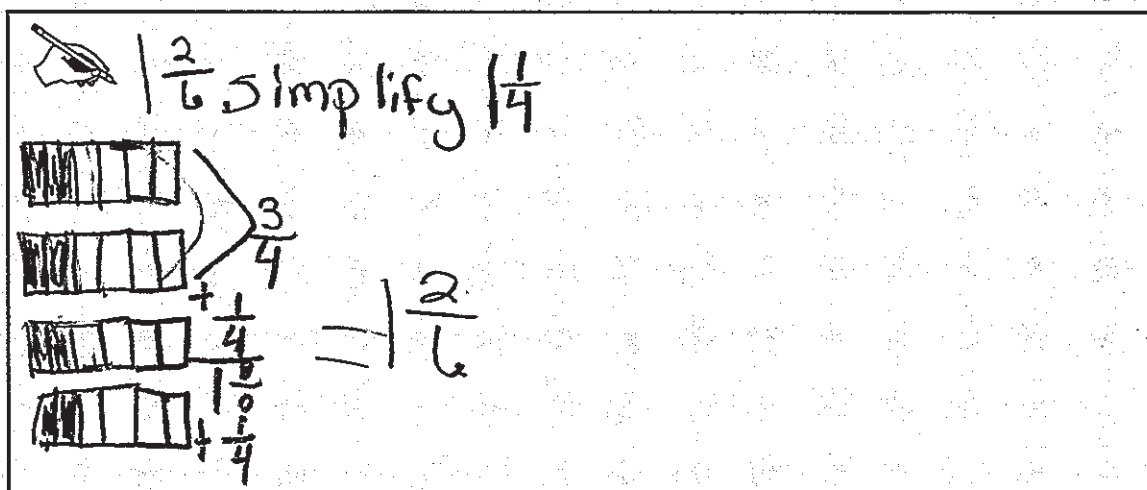
Total Awarded Points: 2 of 7

#### Task 4. The Cake Shop Task

Guide 9a

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.


- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.



Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

  $4 \times 2 = 8$ . So  $8 \times \frac{1}{6} = \frac{8}{6}$ . Because  $8 \times 1 = 8$   
 So you have a whole right there. With 2 leftover they become your fraction. You keep the common denominator of 6 and add 2 to make  $\frac{8}{6}$ . Add  
 $1 + \frac{2}{6} = \frac{8}{6}$ .



REVIEW YOUR  
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Guide 9

Litho 40404

Total Content Points: 1 (4.NF.4a)

Total Practice Points: 1 (MP3)

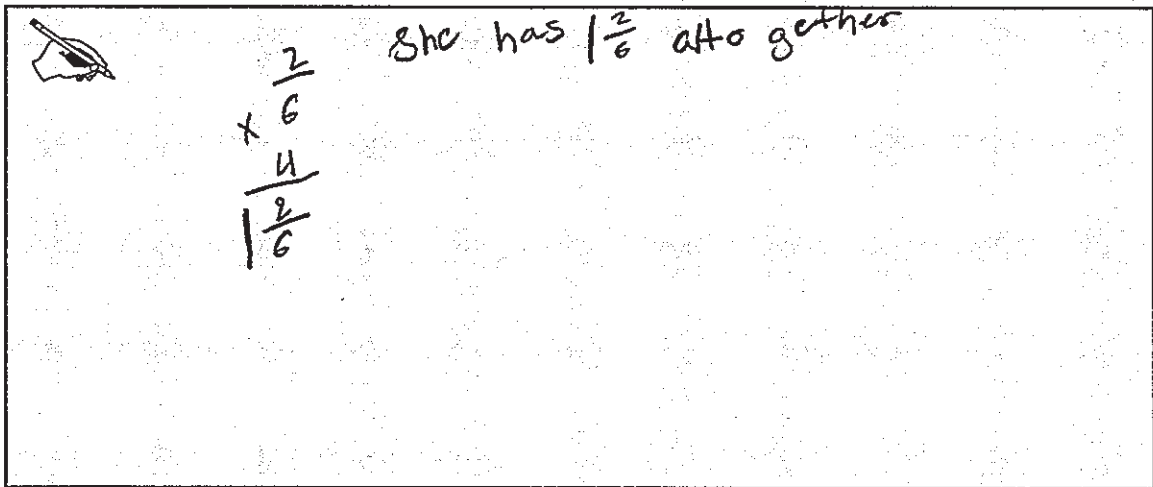
The student's diagram accurately shows four models of  $\frac{2}{6}$ . However, the attempt to label the diagram is inaccurate (no credit for MP2) and indicates some confusion with multiplication of a fraction by a whole number (no credit for 4.NF.4c). Although the correct answer of  $1\frac{2}{6}$  is provided, correct work is not shown (no credit for MP4), and the simplification is incorrect (no credit for MP6). The student's work in part b of the task indicates that the student recognizes that 4 pieces that are each  $\frac{2}{6}$  in size are equivalent to 8 pieces that are each  $\frac{1}{6}$  in size (4.NF.4a). The student demonstrates that  $4 \times \frac{2}{6}$  is the same as  $8 \times \frac{1}{6}$  (MP3). The error in simplification and the lack of clarity in the response indicate an inability to make sense of all aspects of the task (no credit for MP1).

Total Awarded Points: 2 of 7

**Task 4. The Cake Shop Task**

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.




The diagram shows a hand-drawn pencil icon on the left. To its right is a multiplication problem:  $\frac{2}{6} \times 4 = \frac{8}{6}$ . The fraction  $\frac{8}{6}$  is written with a vertical line to its left, and the  $\frac{2}{6}$  part is underlined. To the right of the math is the handwritten text: "She has  $\frac{2}{6}$  altogether".

Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 She can think that way because when I did it in the other question I got the same answer but I did it a different way.



REVIEW YOUR  
WORK IF YOU  
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Guide 10

Litho 40006

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 0

The student correctly identifies the product of  $4 \times \frac{2}{6}$  (4.NF.4c). The student does not demonstrate an understanding of fraction  $\frac{a}{b}$  as a multiple of  $\frac{1}{b}$  in words or equations (no credit for 4.NF.4a). The student's response to part a contains an expression, not an equation (no credit for MP2), and lacks both a diagram and a description of Lisa's cake (no credit for MP4). Additionally, the response to part b of the task lacks clarity. There is no evidence to suggest that the student understands that 8 pieces that are each  $\frac{1}{6}$  in size are equivalent to 4 pieces that are each  $\frac{2}{6}$  in size (no credit for MP3). This indicates a lack of precision (no credit for MP6) and an inability to make sense of all aspects of the task (no credit for MP1).

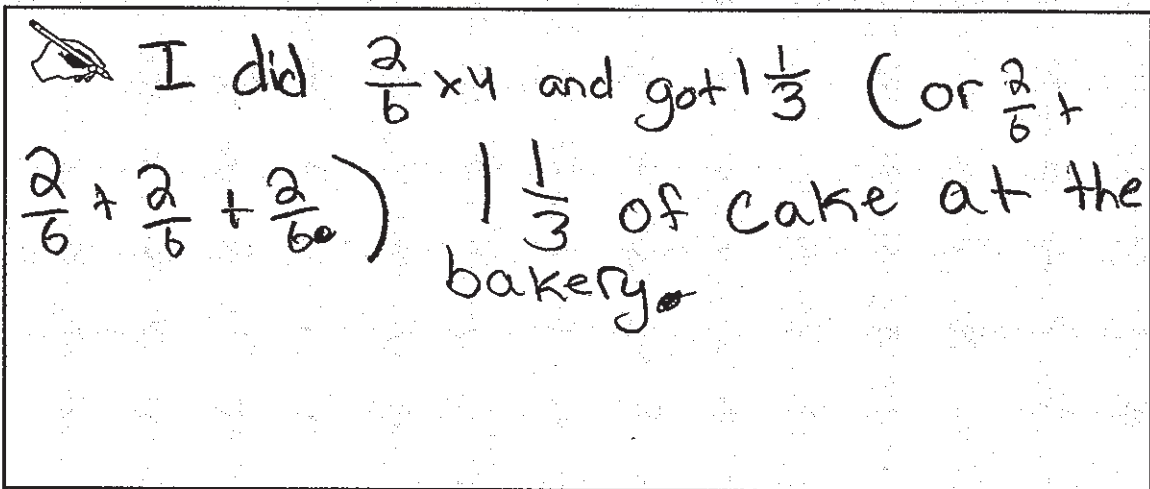
Total Awarded Points: 1 of 7


#### Task 4. The Cake Shop Task

#### Guide 11a

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.





 I did  $\frac{2}{6} \times 4$  and got  $1\frac{1}{3}$  (or  $\frac{2}{6} + \frac{2}{6} + \frac{2}{6} + \frac{2}{6}$ )  $1\frac{1}{3}$  of cake at the bakery.

Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 because  $4 \times 2 \times \frac{1}{6}$  is  $1\frac{2}{6}$  simp is  
 she could also think of it  
 as  $\frac{2}{6}$  that it is times 4  
 $\frac{2}{6} \times 4$  pieces she gets



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Guide 11

Litho 40314

Total Content Points: 1 (4.NF.4c)

Total Practice Points: 0

The student identifies the product of  $4 \times \frac{2}{6}$  by adding  $\frac{2}{6}$  four times as well as by multiplying (4.NF.4c). The student's explanation is incomplete because the student fails to recognize that the number of pieces needs to be doubled when  $\frac{1}{6}$ -sized pieces are considered instead of  $\frac{2}{6}$  (no credit for 4.NF.4a). The student did not make sense of and complete all aspects of the task (no credit for MP1). Although the student indicated the meaning of the amount as it relates to the context, "1  $\frac{1}{3}$  of cake," no equations are given (no credit for MP2, no credit for MP4). The student repeats Lisa's expression as given in the task with no indication that 8 pieces that are each  $\frac{1}{6}$  in size are equivalent to 4 pieces that are each  $\frac{2}{6}$  in size (no credit for MP3). The response does not include a diagram or equation and lacks precision (no credit for MP6).

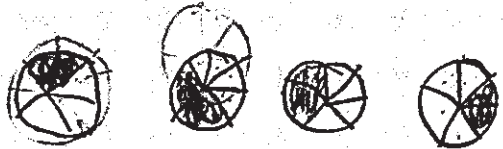
Total Awarded Points: 1 of 7

## Task 4. The Cake Shop Task

Lisa buys different kinds of cake when she goes to the bakery. She likes to get chocolate, vanilla, cherry, and almond cake.

- a. Lisa buys 4 pieces of cake. Each piece is  $\frac{2}{6}$  of a cake. How much cake does she have altogether? Show a diagram and write an equation that shows and describes Lisa's cake.

She will have  $\frac{8}{48}$  of cake because  
 times  $4 \times 2 = 8 \times 1 = 8$ , which will be the numerator  
 then times  $8 \times 6$ , which is 48.






Lisa claims:

I can figure out the number of pieces that I have by thinking about the pieces that are each  $\frac{1}{6}$  of the cake.

- b. When Lisa thinks about the cake this way, she writes  $4 \times 2 \times \frac{1}{6}$  of a cake. Explain why Lisa can think about the cake this way. Use words or diagrams.

 She can think like that because  $4 \times 2 = 8$  and  $8 \times 1 = 8$  and that's  $\frac{8}{6}$  and that's improper so she can times  $8 \times 6 = 48$  so  $\frac{8}{48}$  of cake.



REVIEW YOUR  
WORK IF YOU  
HAVE TIME.

Total Content Points: 0

Total Practice Points: 0

The student's diagram accurately depicts  $\frac{2}{6}$  of 4 cakes. However, the student's computations demonstrate no understanding of the multiplication of a fraction by a whole number (no credit for 4.NF.4c). Although there is some indication that the student recognizes that 8 pieces that are each  $\frac{1}{6}$  in size are equivalent to 4 pieces that are each  $\frac{2}{6}$  in size, the student shows a fundamental misunderstanding of the meaning of the denominator in relation to multiplication of fractions, and does not recognize the meaning of  $\frac{a}{b}$  as it relates to  $a \times \frac{1}{b}$  (no credit for 4.NF.4a, no credit for MP3). The calculations provided are incorrect (no credit for MP2, no credit for MP4), indicating a lack of precision (no credit for MP6) and an inability to make sense of all aspects of the task (no credit for MP1).

Total Awarded Points: 0 of 7