

TCAP/CRA 2012-2013

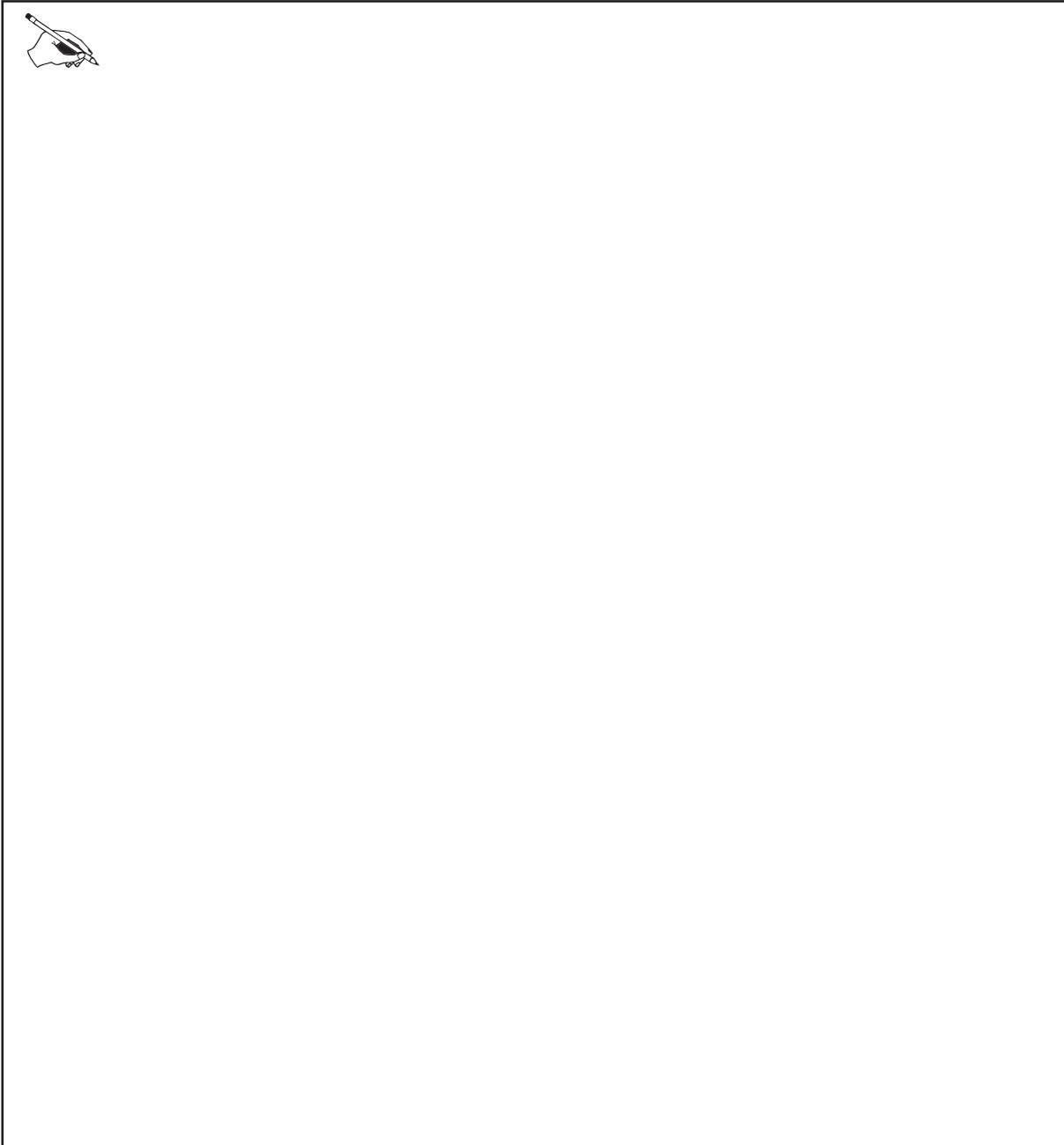


Task 1: Cottage Cheese Task Full Scoring Guide

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.



1. Cottage Cheese Task Scoring Guide

The CCSS for Mathematical Content (2 points)

- 4.NF.3a The student provides reasoning related to addition and/or subtraction of fractions to complete the demands of the task. The student may do this by: _____
- providing work showing understanding of addition and subtraction of fractions as joining and separating parts referring to the same whole.
 - writing an equation showing the sum of $\frac{3}{4} + \frac{3}{4} + \frac{1}{4}$.
 - subtracting the $\frac{3}{4}$, $\frac{3}{4}$, and $\frac{1}{4}$ from 2.
- 4.NF.3d The student identifies the answer of $\frac{1}{4}$ or $\frac{1}{4}$ -cup. _____

Total Content Points _____

The CCSS for Mathematical Practice (3 points)

- MP2 The student adds the three fractions and subtracts from 2 either symbolically or in visual form in order to determine the amount that Mike is allowed to eat; labels answer. _____
(MP2: Reason abstractly and quantitatively)
- MP4 The student models the context of the word problem either through a diagram or equation. _____
(MP4: Model with mathematics.)
- MP6 The student provides accurate work that represents the situation and the solution to the problem, including an equation and a diagram or explanation. _____
(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 understanding of operations on whole numbers.

Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$

- 4.NF.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- 4.NF.3d Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

The CCSS for Mathematical Practice*

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 that are 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 1. Cottage Cheese Task

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Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

$$\frac{3}{4} + \frac{3}{4} + \frac{1}{4} = C$$

$$\begin{array}{r} \frac{3}{4} \\ + \frac{3}{4} \\ + \frac{1}{4} \\ \hline \frac{7}{4} = 1\frac{3}{4} \end{array}$$

2 cups

The diagram shows a horizontal bar divided into 8 equal segments. The first 6 segments are shaded with diagonal lines. Below the bar, there are two groups of three segments each, with a bracket underneath each group labeled $\frac{3}{4}$. Below the remaining two unshaded segments, there is a bracket labeled $\frac{1}{4}$.

First I did $\frac{3}{4} + \frac{3}{4} + \frac{1}{4} = C$ because it is an equation and you need to know how much he had ate. Then I drew a diagram. Each shaded part equals $\frac{1}{4}$, and there are 2 cups in all. I shaded in $\frac{3}{4}$ first, then another $\frac{3}{4}$, and then $\frac{1}{4}$. I had $\frac{1}{4}$ left over. Then I did $\frac{3}{4} + \frac{3}{4} + \frac{1}{4}$. It equalled $\frac{7}{4}$. I knew that $\frac{7}{4} = 1\frac{3}{4}$. Mike can eat $\frac{1}{4}$ cup more cottage cheese.

Guide 1

Litho 13038

Total Content Points: 2 (4.NF.3a, 4.NF.3d)

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

The student provides reasoning related to addition of fractions by creating a diagram that illustrates 2 cups of cottage cheese divided into $\frac{1}{4}$ -cup sections, indicating $\frac{3}{4}$ cup eaten for breakfast and lunch each, $\frac{1}{4}$ cup eaten for dinner, and $\frac{1}{4}$ cup left over (4.NF.3a). The student further clarifies the diagram by providing an explanation noting the division of the cottage cheese. The student also writes an equation, $\frac{3}{4} + \frac{3}{4} + \frac{1}{4} = C$, and solves correctly to find the sum of $1\frac{3}{4}$. The student determines that $\frac{1}{4}$ cup is left for a snack (4.NF.3d). In the written explanation, the student labels the answer with the correct unit of measure and provides a clearly identified strategy for adding the three fractional amounts and subtracting them from 2 cups (MP2). The diagram shows a correct model for the word problem (MP4). The student provides an equation that represents the problem situation and an explanation that accurately and precisely represents the solution to the problem (MP6).

Total Awarded Points: 5 out of 5

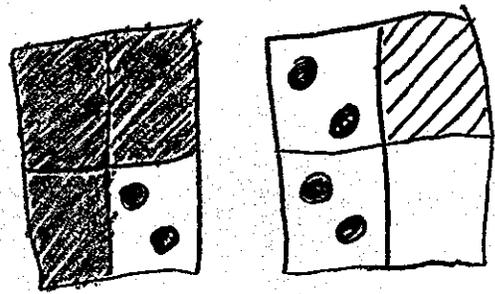
Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

 2 cups = 1 day

Cup 1 Cup 2



$\frac{3}{4}$ breakfast

$\frac{3}{4}$ lunch

$\frac{1}{4}$ dinner

Mike is allowed to have $\frac{1}{4}$ of a cup before bed.

 = cottage cheese left
 = breakfast
 = lunch
 = dinner

Guide 2

Litho 3147

Total Content Points: 2 (4.NF.3a, 4.NF.3d)

Total Practice Points: 2 (MP2, MP4)

The student provides reasoning related to the addition and subtraction of fractions by creating a 2-cup diagram that models $\frac{3}{4}$ cup of cottage cheese eaten for breakfast and lunch, $\frac{1}{4}$ cup eaten for dinner, and $\frac{1}{4}$ cup left over from the initial 2 cups (4.NF.3a, MP4). A key is provided to identify the amounts of cottage cheese eaten at each meal and the amount left over from the 2 cups. The student identifies that $\frac{1}{4}$ cup is left for a snack (4.NF.3d) and labels the answer as required by the language of the task (MP2). Although the student has correctly found the answer to the word problem, the response does not contain an equation representing the situation (no credit for MP6).

Total Awarded Points: 4 out of 5

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

2 cups = 1 day

He is allowed to have $\frac{1}{4}$ of a cup before bed

$\frac{3}{4} = b$ $\frac{3}{4}$ of cottage cheese

$\frac{3}{4}$ of cottage cheese

$\frac{1}{4} = d$ $\frac{1}{4}$ of cottage cheese

$\frac{3}{4}$ of cottage cheese

$2 - \frac{3}{4} = \frac{1}{4}$

$\frac{7}{4} = \frac{1}{4}$

How much cottage cheese he has left to eat

Guide 3

Litho 3137

Total Content Points: 2 (4.NF.3a, 4.NF.3d)

Total Practice Points: 2 (MP2, MP4)

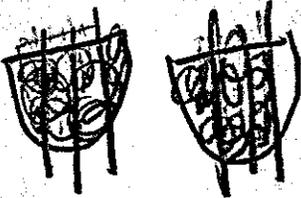
The student provides a diagram that clearly represents the amount of cottage cheese eaten for each meal: $\frac{3}{4}$ cup for breakfast, $\frac{3}{4}$ cup for lunch, and $\frac{1}{4}$ cup for dinner. Another diagram shows all three amounts added together (4.NF.3a, MP4). The student identifies that $\frac{1}{4}$ cup is left over for a snack (4.NF.3d). The student attempts to add the three fractions symbolically in order to determine the amount that Mike is allowed to eat and labels the answer (MP2). The student's reasoning is correct, but with some gaps, and there is no correct equation representing the situation or solution (no credit for MP6).

Total Awarded Points: 4 out of 5

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.



 2 cups of cottage cheese per day

$\frac{3}{4}$ B

 $\frac{3}{4}$ L

 $\frac{1}{4}$ D

I Shaded in 7 spots because $3+3+1=7$.

Answer: $\frac{1}{4}$ is left to eat before bed

Guide 4

Litho 3173

Total Content Points: 2 (4.NF.3a, 4.NF.3d)

Total Practice Points: 1 (MP4)

The student provides reasoning related to addition and subtraction of fractions by creating a diagram that shows the two cups of cottage cheese divided in such a way that it is clear that the total of the shaded portions equals $1\frac{3}{4}$ cups (4.NF.3a). An explanation (“I Shaded in 7 spots because $3 + 3 + 1 = 7$ ”) supports the diagram, which successfully models the context of the problem (MP4). The student identifies the answer as $\frac{1}{4}$ “left to eat before bed” (4.NF.3d), but the answer is not labeled with the correct unit of measure (no credit for MP2). Although the equation $3 + 3 + 1 = 7$ is sufficient to explain the diagram, the equation does not precisely refer to the context of the problem (no credit for MP6).

Total Awarded Points: 3 out of 5

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

$\frac{3}{4}$ = Breakfast
 $\frac{3}{4}$ = lunch
 $\frac{1}{4}$ = dinner

$\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$ or 1
 $+ \frac{3}{4}$

$1\frac{3}{4} - 1\frac{1}{4} = \frac{1}{4}$

So he has $\frac{1}{4}$ left to eat before bed.

$B = \frac{3}{4}, L = \frac{3}{4}, \text{ and } D = \frac{1}{4}.$
 $\frac{1}{4}$ plus $\frac{3}{4} = 1$ whole, you add 1 whole and $\frac{3}{4} = 1\frac{3}{4}.$ That's how much he's had. He has $\frac{1}{4}$ left.

Guide 5

Litho 3153

Total Content Points: 2 (4.NF.3a, 4.NF.3d)

Total Practice Points: 1 (MP4)

The student provides reasoning related to addition of fractions by creating a diagram that shows the two cups of cottage cheese divided in such a way that it is clear which areas represent breakfast, lunch, dinner, and “leftover” (4.NF.3a, MP4). The student identifies that “He has $\frac{1}{4}$ left” to eat for a snack (4.NF.3d). This response does not contain a correct equation that fully represents the situation (no credit for MP6), nor does it demonstrate full attention to the context of the task, as the answer given is not labeled with the correct unit of measure (no credit for MP2).

Total Awarded Points: 3 out of 5

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

$\frac{3}{4} + \frac{3}{4} + \frac{1}{4} = \frac{7}{4}$

or .75 or .75 or .25

$4 \overline{) 7} \begin{array}{r} 1 \\ -4 \\ \hline 3 \end{array}$

$4 \overline{) 13} \begin{array}{r} 3 \\ -12 \\ \hline 1 \end{array}$

what I did was I knew that $\frac{3}{4} + \frac{3}{4} = \frac{6}{4}$ because $3+3=6$ and denominator stays the same then $+1 = \frac{7}{4}$ then you divide that answer by dividing $4 \overline{) 7}$ which equals $1 \frac{3}{4}$ so that is how much he ate before bed and I drew 3 pie charts that showed that have $\frac{3}{4}$ and then the the last one has $\frac{1}{4}$ shaded in and I also converted the fractions to decimals.

Guide 6

Litho 13021

Total Content Points: 1 (4.NF.3a)

Total Practice Points: 1 (MP4)

The student provides reasoning related to addition of fractions by writing an equation showing the sum of $\frac{3}{4} + \frac{3}{4} + \frac{1}{4}$ (4.NF.3a). The student models the context of the word problem through this equation, and uses pie charts to show the portions eaten and the conversion of fractional values to decimals: .75, .75, and .25 (MP4). While the equation and the diagram help to model the context of the problem, they do not represent the solution (no credit for 4.NF.3d, no credit for MP6). The student does not indicate a clear path to finding the solution by subtracting the total found from 2 cups (no credit for MP2).

Total Awarded Points: 2 out of 5

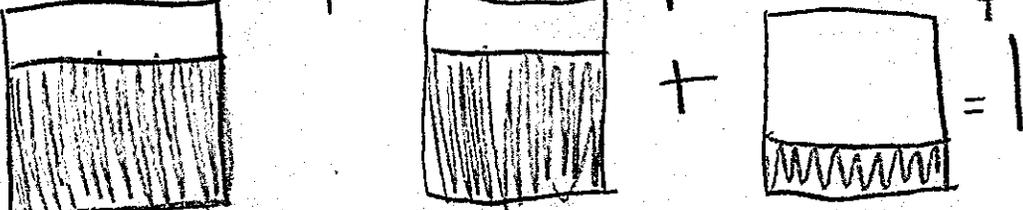
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Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

 2 cups of cheese per day

Breakfast = $\frac{3}{4}$ Lunch = $\frac{3}{4}$ dinner = $\frac{1}{4}$



Lunch + dinner = 1 whole cup

$\frac{3}{4} + \frac{1}{4} = 1 + \text{breakfast } (\frac{3}{4}) = 1\frac{3}{4}$

But, it says how much can he eat before bed, he can eat $\frac{1}{4}$ cups of cottage cheese before bed.

Guide 7

Litho 3161

Total Content Points: 1 (4.NF.3a)

Total Practice Points: 1 (MP4)

The student provides reasoning related to addition of fractions by presenting steps to solve the expression $\frac{3}{4} + \frac{3}{4} + \frac{1}{4}$ (4.NF.3a) and models the fractions being added using a diagram (MP4).

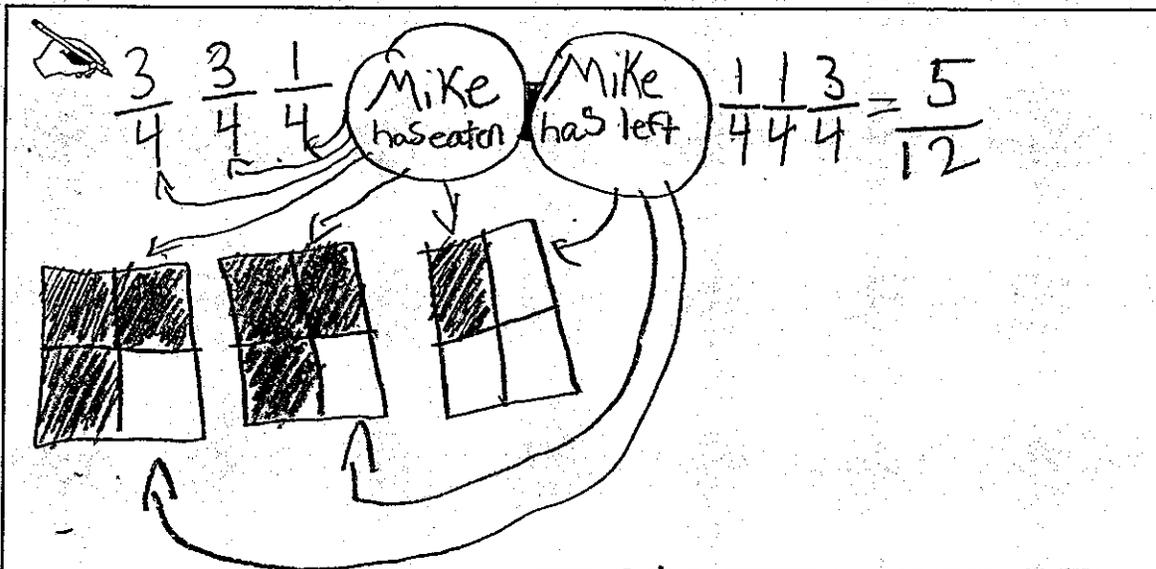
The diagram does not demonstrate a clear strategy for combining the three amounts eaten and subtracting the total from 2 cups, and the answer given is not correct (no credit for MP2, no credit for MP6). The student incorrectly identifies the answer as $1\frac{1}{4}$ cups (no credit for 4.NF.3d).

Total Awarded Points: 2 out of 5

Task 1. Cottage Cheese Task

Mike loves cottage cheese. His mother allows him to eat 2 cups of cottage cheese each day. So far today he has eaten $\frac{3}{4}$ cup at breakfast, another $\frac{3}{4}$ cup at lunch, and $\frac{1}{4}$ cup at dinner. How much more cottage cheese is Mike allowed to eat before bed?

Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.



First I wrote the fractions of how much he ate then wrote them in square shapes and shaded $\frac{3}{4}$ of one another $\frac{3}{4}$ of one and a $\frac{1}{4}$ and made fractions into the amount $\frac{1}{4}$ had left in each box and added $\frac{1}{4} + \frac{1}{4} + \frac{3}{4}$ and he had $\frac{5}{4}$ of cottage cheese left to eat before bed.

Mike could eat $\frac{5}{4}$ of cottage cheese left to eat before bedtime.

Total Content Points: 0

Total Practice Points: 1 (MP4)

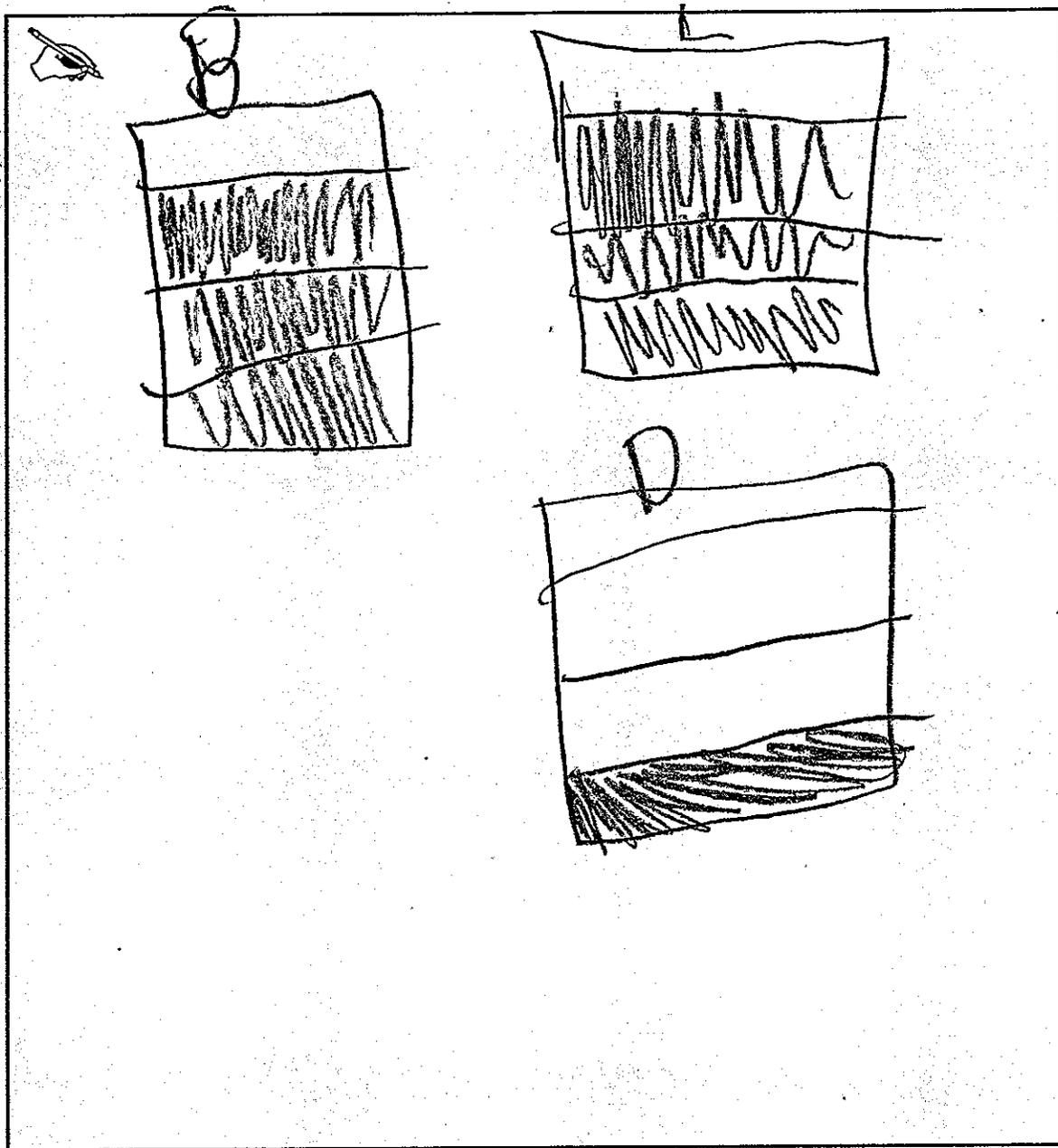
This student demonstrates some understanding of the representation of fractions by correctly modeling the fractional amounts of cottage cheese eaten at each meal (MP4). However, the response does not demonstrate an understanding of addition of fractions as joining parts referring to the same whole (no credit for 4.NF.3a). Misunderstanding of both the values in the problem and the addition of fractions leads to an incorrect answer, " $\frac{5}{12}$ of cottage cheese" (no credit for 4.NF.3d). The diagram indicates that the amounts eaten need to be subtracted from the original amount, but the student does not recognize that the original amount is 2 cups (no credit for MP2). The diagram does not model the solution to the problem, and the addition shown is not accurate (no credit for MP6).

Total Awarded Points: 1 out of 5

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Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.



Total Content Points: 0

Total Practice Points: 1 (MP4)

The student demonstrates minimal understanding of the situation by modeling the context of the word problem through a diagram (MP4). The diagram correctly models the fractions in the problem; however, addition of the three amounts is not modeled, so there is no evidence of understanding the addition of fractions as joining parts referring to the same whole (no credit for 4.NF.3a). The student has not provided an equation or any work representing the solution to the problem (no credit for MP6), and the diagram does not provide any indication of a strategy for solving the word problem (no credit for MP2). The student does not identify the correct solution to the problem (no credit for 4.NF.3d).

Total Awarded Points: 1 out of 5

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Use an equation and a diagram or explanation to show how much more cottage cheese Mike is allowed to eat before bed.

The student's work is contained within a rectangular box. In the top left corner of the box is a small drawing of a hand holding a pencil. The main part of the work consists of a larger rectangle with a hand-drawn border. Inside this rectangle, on the left side, are three horizontal lines representing a subtraction problem: 2 cups, 1 cup, and 0 cups. To the right of these lines, the student has written: $\frac{3}{4}$ breakfast, $\frac{3}{4}$ at lunch, and $\frac{1}{4}$ at dinner. Below the rectangle, the student has written the equation: $\frac{3}{4} \times \frac{3}{4} \times \frac{1}{4} = \frac{9}{4}$.

Total Content Points: 0

Total Practice Points: 0

This student does not correctly calculate the amount of cottage cheese Mike is allowed to eat before bed (no credit for 4.NF.3d). The student identifies the values needed to solve the problem, but incorrectly uses multiplication as a strategy (no credit for MP2). The student does not add fractions together (no credit for 4.NF.3a). The equation neither represents the situation (no credit for MP6) nor models the context of the problem (no credit for MP4).

Total Awarded Points: 0 out of 5