

TCAP/CRA 2012-2013



Task 2: Pillow Cases Task


NOTE: This is the universally scored task for Grade 5. Please visit www.tncore.org for more information on Phase II updates and changes.

Full Scoring Guide

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.



A large rectangular box for writing the answer to question a. In the top-left corner, there is a small icon of a hand holding a pen and writing on a piece of fabric.

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.



A large rectangular box for writing the answer to question b. In the top-left corner, there is a small icon of a hand holding a pen and writing on a piece of fabric.

2. Pillow Cases Task Scoring Guide

The CCSS for Mathematical Content (2 points)

- 5.NF.6 The student demonstrates a strategy for multiplying a fraction by a mixed number. _____
The student may do this in one of the following ways:
- by multiplying a mixed number with a whole number by changing the mixed number to an improper fraction.
 - by decomposing the mixed number into a whole number and a fraction (1 and $\frac{3}{4}$) and then multiplying each of these by 3 . The total product is the sum of the two partial products ($3 + 2\frac{1}{4}$).
 - by drawing a diagram indicating the multiples of $1\frac{3}{4}$.
- 5.NF.2 The student finds the difference between $5\frac{1}{4}$ and $6\frac{2}{3}$. The student may do this in _____
one of the following ways:
- by adding $1\frac{3}{4} + 1\frac{3}{4} + 1\frac{3}{4}$ and finding the difference between that sum and $6\frac{2}{3}$ through subtracting or through adding on from $5\frac{1}{4}$ to $6\frac{2}{3}$.
 - by subtracting $1\frac{3}{4}$ three times from $6\frac{2}{3}$.
 - by using a visual fraction model to show the subtraction.

Total Content Points _____

The CCSS for Mathematical Practice (3 points)

MP1 The student completes both parts of the task. The student determines that 3 groups _____
of $1\frac{3}{4}$ are needed for the pillow cases, and that the difference needs to be
determined between the total amount of fabric used and the total amount of fabric
purchased.

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

MP2 The student creates equations or diagrams related to the task using the quantities of _____
 $1\frac{3}{4}$, 3, and $6\frac{2}{3}$, and then contextualizes the solutions to state that Brady needs $5\frac{1}{4}$
yards for 3 pillow cases and that there will be $1\frac{5}{12}$ yards of fabric left over.

(MP2: Reason abstractly and quantitatively.)

MP4 The student provides accurate diagrams and/or equations using fractions. _____

(MP4: Model with mathematics.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result, $2/5 + 1/2 = 3/7$, by observing that $3/7 < 1/2$.*

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

5.NF.6 Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or 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.

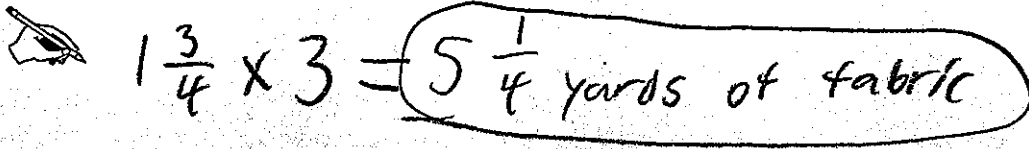
*Gray text indicates Mathematical Practices that are not addressed in this task.

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 2. Pillow Cases Task

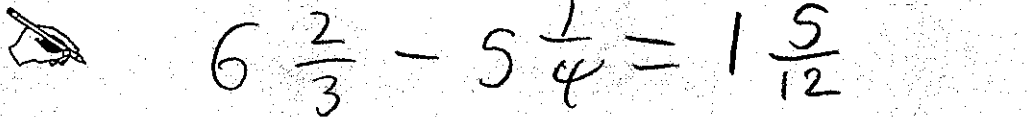
Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.



$1\frac{3}{4} \times 3 = 5\frac{1}{4}$ yards of fabric

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.



$6\frac{2}{3} - 5\frac{1}{4} = 1\frac{5}{12}$

Brady has $1\frac{5}{12}$ yards of fabric left over

Guide 1

Litho 4057

Total Content Points: 2 (5.NF.6, 5.NF.2)

Total Practice Points: 3 (MP1, MP2, MP4)

The student correctly multiplies a whole number by a mixed number ($1\frac{3}{4} \times 3 = 5\frac{1}{4}$) (5.NF.6), and correctly subtracts to find the difference between $6\frac{2}{3}$ and $5\frac{1}{4}$ ($6\frac{2}{3} - 5\frac{1}{4} = 1\frac{5}{12}$) (5.NF.2). The student completes both parts of the task and employs a correct process, multiplying $1\frac{3}{4} \times 3$ and subtracting that result from $6\frac{2}{3}$, thus making sense of problems and persevering in solving them (MP1). The student provides accurate equations ($1\frac{3}{4} \times 3 = 5\frac{1}{4}$; $6\frac{2}{3} - 5\frac{1}{4} = 1\frac{5}{12}$) and contextualizes the answers by appropriately labeling both solutions in yards (MP4, MP2).

Total Awarded Points: 5 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

3 pillows times $1\frac{3}{4}$ (the amount of fabric it takes for one pillow) = $5\frac{1}{4}$ yards of fabric.

0 $1\frac{3}{4}$ $3\frac{1}{2}$ $5\frac{1}{4}$ fabric

0 1 2 3 pillows

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

$6\frac{2}{3}$ (amount of fabric bought) - $5\frac{1}{4}$ yards of fabric (the amount of fabric Brady needs to make 3 pillows) = $1\frac{1}{2}$ of a yard of fabric will be left over after Brady makes 3 pillows

Guide 2

Litho 10135

Total Content Points 2 (5.NF.2, 5.NF.6)

Total Practice Points: 2 (MP2, MP4)

The student draws a double number line indicating the multiples of $1\frac{3}{4}$ ($1\frac{3}{4}, 3\frac{1}{2}, 5\frac{1}{4}$)

(5.NF.6), and correctly finds the difference between $6\frac{2}{3}$ and $5\frac{1}{4}$ ($6\frac{2}{3} - 5\frac{1}{4} = 1\frac{5}{12}$)


(5.NF.2). The student does not write a multiplication equation to solve the problem (no credit for MP1). The student correctly models the solution and correctly solves the problem using a double number line and reasoning, with proper labeling in yards (MP4, MP2).

Total Awarded Points: 4 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.


- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.



$$3 \times 1\frac{3}{4} = 5\frac{1}{4}$$

You should multiply $3 \times 1\frac{3}{4}$. $5\frac{1}{4}$ of fabric

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.



$$\begin{array}{r} 6\frac{2}{3} \\ - 5\frac{1}{4} \\ \hline 1\frac{5}{12} \end{array}$$

You should subtract $6\frac{2}{3}$ by $5\frac{1}{4}$. $1\frac{5}{12}$ would be left over

Guide 3

Litho 4073

Total Content Points: 2 (5.NF.2, 5.NF.6)

Total Practice Points: 1 (MP4)

The student correctly multiplies a whole number by a mixed number using the equation $3 \times 1\frac{3}{4} = 5\frac{1}{4}$ (5.NF.6), and correctly finds the difference between $6\frac{2}{3}$ and $5\frac{1}{4}$ (5.NF.2).

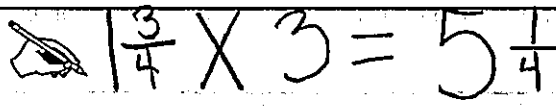
The student does not write a mathematically correct equation for $6\frac{2}{3} - 5\frac{1}{4}$ (no credit for MP1). The equation $3 \times 1\frac{3}{4} = 5\frac{1}{4}$ is an accurate model (MP4), but the student does not contextualize solutions by labeling them in yards (no credit for MP2).

Total Awarded Points: 3 out of 5

Task 2. Pillow Cases Task

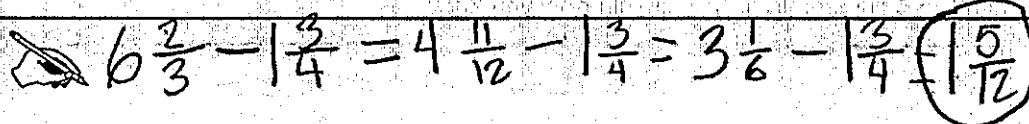
Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.



$1\frac{3}{4} \times 3 = 5\frac{1}{4}$

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.



$6\frac{2}{3} - 1\frac{3}{4} = 4\frac{11}{12} - 1\frac{3}{4} = 3\frac{1}{6} - 1\frac{3}{4} = 1\frac{5}{12}$

Guide 4

Litho 10125

Total Content Points: 2 (5.NF.2, 5.NF.6)

Total Practice Points: 1 (MP1)

The student correctly multiplies a whole number by a mixed number using the equation $1\frac{3}{4} \times 3 = 5\frac{1}{4}$ (5.NF.6), and correctly finds the difference between $6\frac{2}{3}$ and $5\frac{1}{4}$ (5.NF.2).

The student makes sense of the problems and perseveres in solving them by multiplying $1\frac{1}{3} \times 3$ in Part A and by subtracting $1\frac{3}{4}$ from $6\frac{2}{3}$ three times in Part B (MP1), but does

not label the solutions in yards (no credit for MP2). The equation in Part B ($6\frac{2}{3} -$


$1\frac{3}{4} = 4\frac{11}{12} - 1\frac{3}{4} = 3\frac{1}{6} - 1\frac{3}{4} = 1\frac{5}{12}$) is a guide to the student's reasoning, but is an inaccurate mathematical equation (no credit for MP4).

Total Awarded Points: 3 out of 5

Task 2. Pillow Cases Task


Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.



$$3 \times 1\frac{3}{4} = 5\frac{1}{4}$$

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.



she has

$$1\frac{5}{12} \text{ left}$$

Guide 5

Litho 10250

Total Content Points: 1 (5.NF.6)

Total Practice Points: 1 (MP4)

The student correctly multiplies a whole number by a mixed number ($3 \times 1\frac{3}{4} = 5\frac{1}{4}$) and provides the correct solution to Part B ($1\frac{5}{12}$) (5.NF.6), but does not demonstrate subtraction of $6\frac{2}{3} - 5\frac{1}{4}$ (no credit for 5.NF.2). The student does not show how to determine the answer in Part B and does not label the solutions in yards (no credit for MP1, no credit for MP2). The equation $3 \times 1\frac{3}{4} = 5\frac{1}{4}$ is an accurate model (MP4).


Total Awarded Points: 2 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.


X = NO
✓ = YES

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

	$3 \div 1\frac{3}{4} = 1\frac{5}{7}$	X
	$3 \times 1\frac{3}{4} = 5\frac{1}{3}$	✓

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

X = NO ✓ = YES

	$6\frac{2}{3} - 5\frac{1}{3} = 1\frac{1}{3}$	✓
	$6\frac{2}{3} \div 5\frac{1}{3} = 1\frac{22}{19}$ $1\frac{13}{19}$	X

Guide 6

Litho 10274

Total Content Points: 1 (5.NF.2)

Total Practice Points: 1 (MP1)

The student checks the answer to be considered, but the multiplication equation $3 \times 1\frac{3}{4} = 5\frac{1}{5}$ is incorrect (no credit for 5.NF.6). Although the student subtracts the incorrect solution in Part A from $6\frac{2}{3}$ in Part B, the resulting equation checked by the student ($6\frac{2}{3} - 5\frac{1}{5} = 1\frac{7}{15}$) is correct (5.NF.2). Both solutions are incorrect, but the student uses the correct processes of multiplication and subtraction, demonstrating an understanding of how to solve the problems (MP1). The student does not label the solutions in yards (no credit for MP2). Since the equation in Part A ($3 \times 1\frac{3}{4} = 5\frac{1}{5}$) is incorrect, it cannot stand as a mathematical model (no credit for MP4).

Total Awarded Points: 2 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

1.75 is the something

as $1\frac{3}{4}$. I found out he will need 5.25 or $5\frac{1}{4}$ yard of fabric.

$$1\frac{3}{4} \times 3 = 5.25 = 5\frac{1}{4}$$

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

6.66
- 5.25

1.41 yards left over

Brady will have about 1.4 yards of fabric left over after he makes 3 pillow cases.

Guide 7

Litho 4101

Total Content Points: 0

Total Practice Points: 1 (MP2)

The student does not write a multiplication equation using fractions (no credit for 5.NF.6), and does not find the correct difference between $6\frac{2}{3}$ and $5\frac{1}{4}$ (no credit for 5.NF.2). The student does not write mathematically correct equations to complete both parts of the task or to model with mathematics (no credit for MP1, no credit for MP4). The student provides correct labels (yards) for each solution (MP2).

Total Awarded Points: 1 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

$$\begin{array}{r} 1\frac{3}{4} \\ + 1\frac{3}{4} \\ + 1\frac{3}{4} \\ \hline 3\frac{9}{12} \end{array}$$

$$1\frac{3}{4} \times 3$$

I know you multiply $1\frac{3}{4}$ by 3 but I do not know how to multiply it so I just added.

She needs $3\frac{9}{12}$ of fabric to cover 3 pillows.

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

$$\begin{array}{r} 6\frac{2}{3} \\ - 3\frac{9}{12} \\ \hline 3\frac{1}{2} \end{array}$$

$$6\frac{2}{3} - 3\frac{9}{12}$$

$$6\frac{2 \times 4}{3 \times 4} = 6\frac{8}{12}$$

$$6\frac{8}{12} - 3\frac{9}{12} = 3\frac{1}{2}$$

She would have $3\frac{1}{2}$ yards of fabric left over.

Total Content Points: 0

Total Practice Points: 1 (MP1)

The student does not write a multiplication equation and generates an incorrect solution ($3\frac{9}{12}$) when adding $1\frac{3}{4} + 1\frac{3}{4} + 1\frac{3}{4}$ (no credit for 5.NF.6). The student does not

accurately subtract the incorrect Part A answer ($3\frac{9}{12}$) from $6\frac{2}{3}$ (no credit for 5.NF.2).

The student does not provide accurate equations (no credit for MP4). All of the student's calculations are incorrect (no credit for MP2). The student knows the correct process for finding the amount of fabric needed ("I know you multiply $1\frac{3}{4}$ by 3"), as well as showing

that the answer must be subtracted from $6\frac{2}{3}$ to find the amount of fabric left over

($6\frac{8}{12} - 3\frac{9}{12}$), demonstrating the ability to reason and make sense of problems (MP1).

Total Awarded Points: 1 out of 5

Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

$$\begin{array}{r} 3 \\ \times 1\frac{3}{4} \\ \hline 5.25 \end{array}$$

$$\begin{array}{r} 1.75 \text{ fabric} \\ \times 3 \text{ pillows} \\ \hline 5.25 \end{array}$$

5.25 yards of fabric

I solved the problem by making $1\frac{3}{4}$ into a decimal which was 1.75 and multiplying it by 3.0 I got 5.25 as an answer

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

Guide 9

Litho 4119

Total Content Points: 0

Total Practice Points: 0


The student uses decimals and does not provide a multiplication equation using fractions (no credit for 5.NF.6). The student does not attempt to solve Part B (no credit for 5.NF.2), and therefore, does not complete both parts of the task (no credit for MP1). The student does not provide mathematically correct equations (no credit for MP2) and does not model multiplication of fractions (no credit for MP4).

Total Awarded Points: 0 out of 5


Task 2. Pillow Cases Task

Brady likes to sew. She is making pillow cases that use $1\frac{3}{4}$ of a yard of fabric each. Brady has 3 pillows that she wants to cover.

- a. How much fabric does she need? Write a multiplication equation that shows how you solved the problem.

 $1\frac{3}{4} \times 3 = 12 \times 3 \text{ pillows} = 36$ fabric she needs to make for her 3 pillow cases

- b. At the fabric store, Brady buys $6\frac{2}{3}$ yards of fabric. How much fabric does Brady have left over after she makes the 3 pillow cases? Use an equation or diagram to prove your answer.

 $6\frac{2}{3} - 36 \times 3 = 100$

3	6	9	12	15	18
36	72	100	144	180	216

So $\frac{9}{100}$ would be the answer to your problem because I did $6\frac{2}{3} = 36 \times 3 \text{ pillow cases} = 100$ and I was trying to get one hundred and 9 over 100 was the correct one.

Total Content Points: 0

Total Practice Points: 0

The student's solution to Part A ($1\frac{3}{4} = 12 \times 3 = 36$) is incorrect (no credit for 5.NF.6), as is the solution to Part B ($6\frac{2}{3} = 36 \times 3 = 100$) (no credit for 5.NF.2). The student's inaccurate equations ($1\frac{3}{4} = 12 \times 3 = 36$; $6\frac{2}{3} = 36 \times 3 = 100$) and chart coupled with the student's explanation ("I was trying to get one hundred and 9 over 100 was the correct one") indicate a lack of understanding of the correct processes for solving this task (no credit for MP4, no credit for MP1). The student does not label the solutions provided in yards (no credit for MP2).

Total Awarded Points: 0 out of 5