Tennessee Comprehensive Assessment Program

TCAP/CRA 2013

5

Task 4 Scoring Guide

Dividing Fractions Task

4. Dividing Fractions Task Scoring Guide

The CCSS for Mathematical Content (2 points)

5.NF.B.7a Provides the answer to $\frac{1}{4} \div 3 = \frac{1}{12}$. _____

(1 Point)

5.NF.B.7b Provides the answer to $5 \div \frac{1}{6} = 30$. _____

(1 Point)

Total Content Points _____

The CCSS for Mathematical Practice (2 points)

MP4x Models the given division expression in part a using a number line or visual model. _____

(1 Point)

(MP4: Model with mathematics.)

MP4z Models the given division expression in part b using a number line or visual model. _____

(1 Point)

(MP4: Model with mathematics.)

Total Practice Points _____

Total Awarded Points _____

The CCSS for Mathematical Content Addressed in This Task

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

5.NF.B.7a Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.*

5.NF.B.7b Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.*

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.

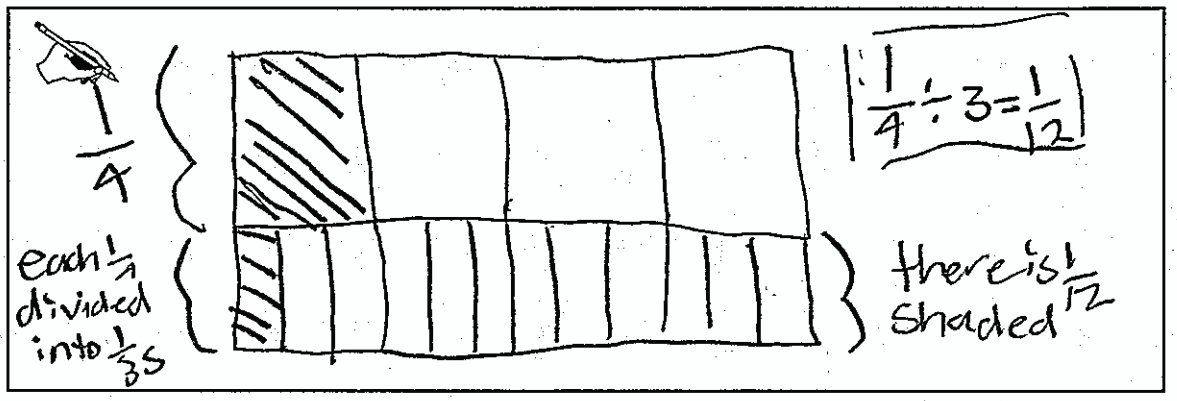
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

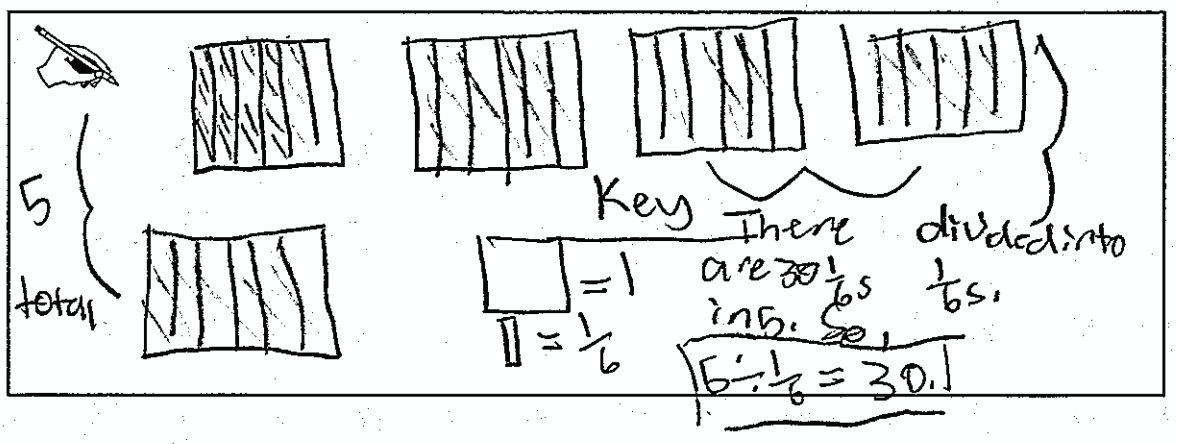
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ $\frac{1}{12}$



b. $5 \div \frac{1}{6} =$ 30



Guide 1 Litho 538145

Total Content Points: 2 (5.NF.B.7a, 5.NF.B.7b)

Total Practice Points: 2 (MP4x, MP4z)

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, correctly interpreting division of a whole number by a unit fraction (5.NF.B.7b). The student models the given division expressions using visual models. In Part A, $\frac{1}{4}$ is shown first with a rectangle divided into fourths, then each $\frac{1}{4}$ is shown divided into thirds with $\frac{1}{12}$ of the total area shaded $\frac{1}{12}$ (MP4x). In Part B, the student draws 5 whole figures and divides each whole into 6 parts to show a total of 30 parts (MP4z).

Total Awarded Points: 4 out of 4

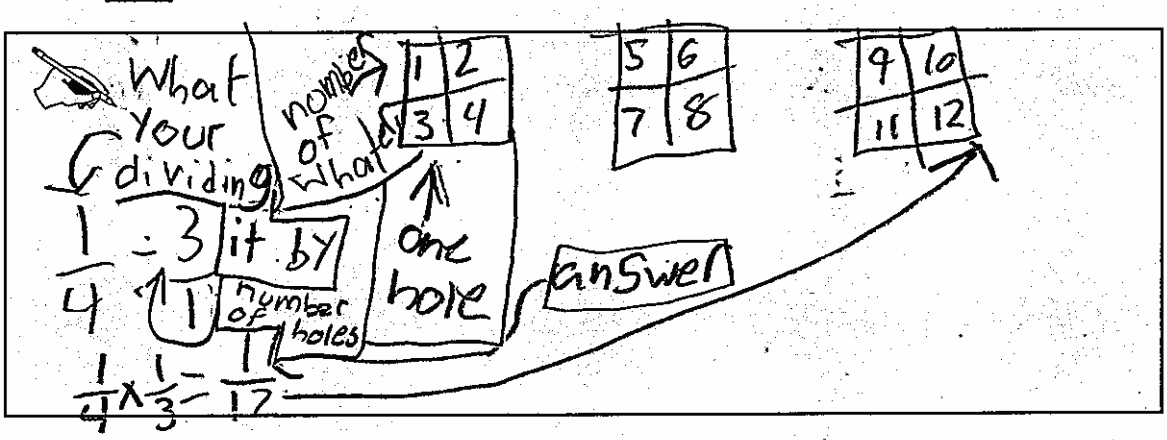
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

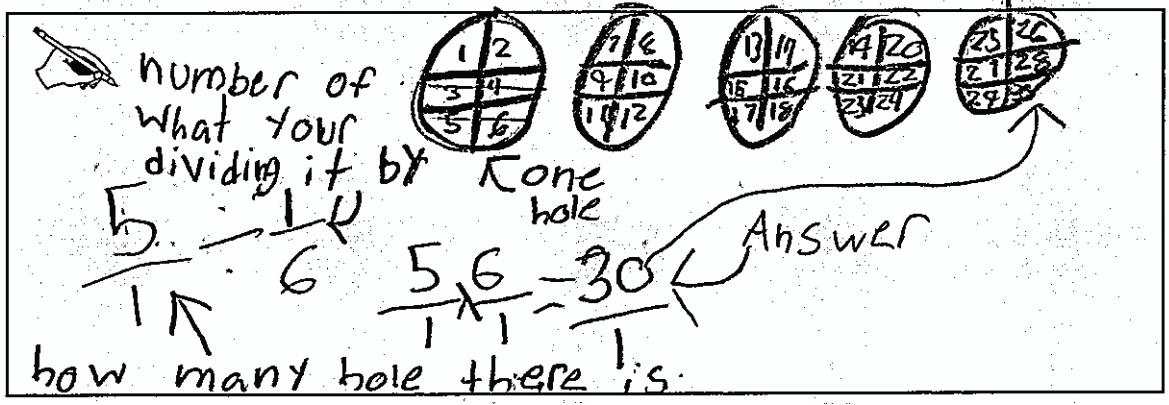
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ ☐



b. $5 \div \frac{1}{6} =$ ☐



Litho#: 569599

Guide 2 Litho 569599

Total Content Points: 2 (5.NF.B.7a, 5.NF.B.7b)

Total Practice Points: 1 (MP4z)

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). In Part A, the student does not model the division expression using a correct visual model (no credit for MP4x). In Part B, the student draws 5 whole figures and divides each whole into 6 parts to show a total of 30 parts (MP4z).

Total Awarded Points: 3 out of 4

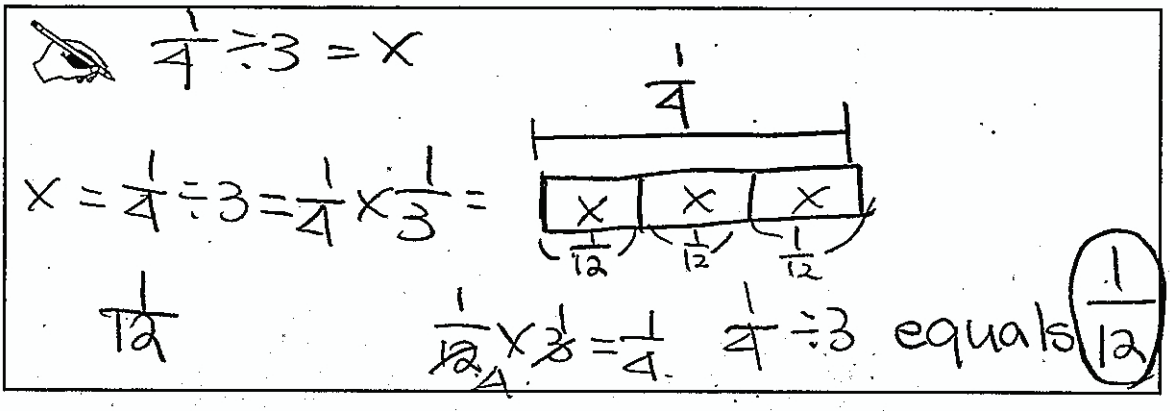
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

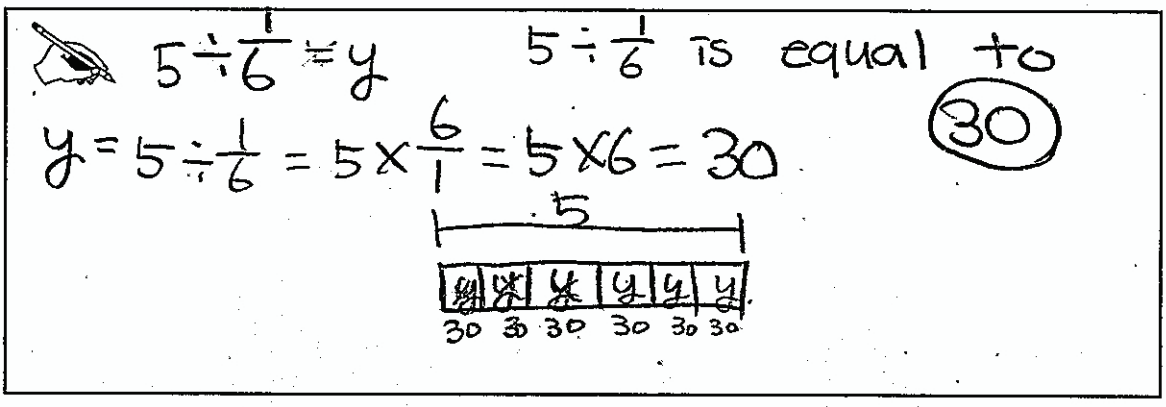
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ ☐



b. $5 \div \frac{1}{6} =$ ☐



Litho#: 512901

Guide 3 Litho 512901

Total Content Points: 2 (5.NF.B.7.a, 5.NF.B.7b)

Total Practice Points: 1 (MP4x)

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). In Part A, the student correctly models $\frac{1}{4}$ divided into thirds to arrive at $\frac{1}{12}$ (MP4x). In Part B, the student does not model the division expression using a correct visual model (no credit for MP4z).

Total Awarded Points: 3 out of 4

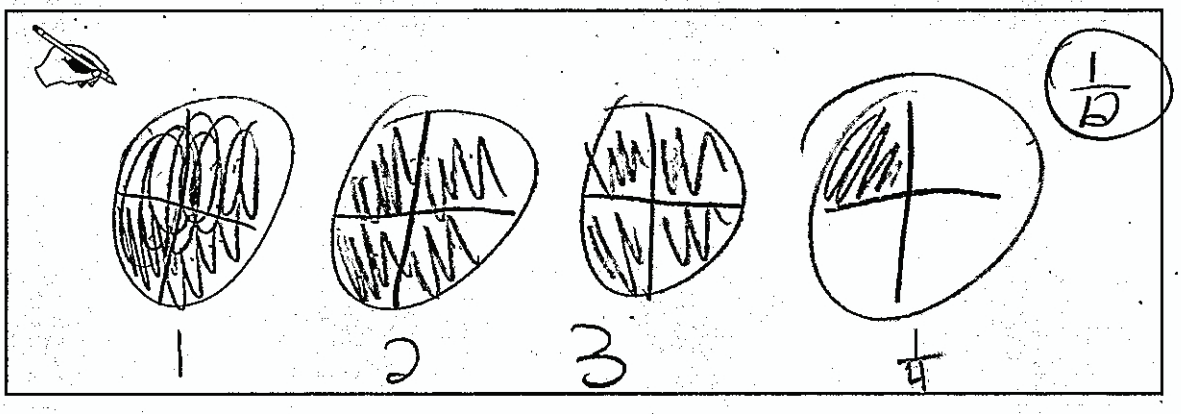
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

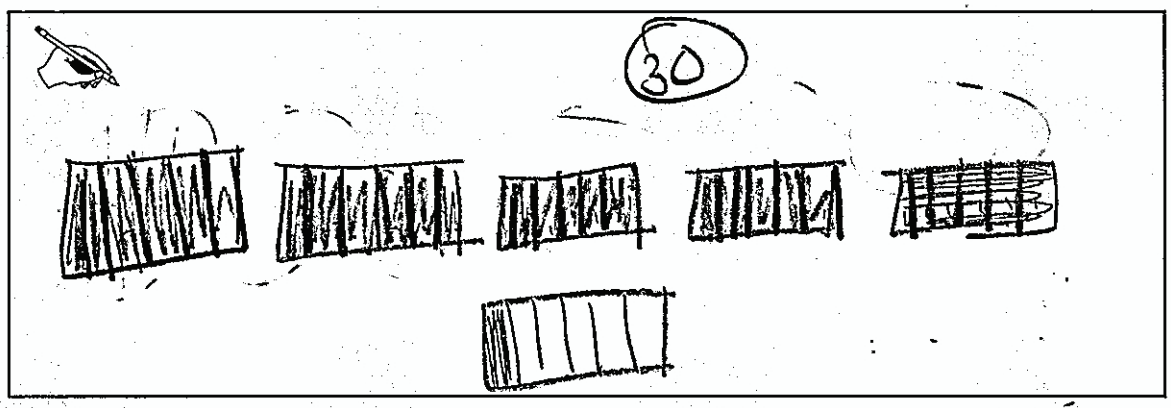
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ ☐



b. $5 \div \frac{1}{6} =$ ☐



Litho#: 570239

Guide 4 Litho 570239

Total Content Points: 2 (5.NF.B.7a, 5.NF.B.7b)

Total Practice Points: 1 (MP4z)

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). In Part A, the student does not model the given division expression using a correct visual model (no credit for MP4x). In Part B, the student draws 5 whole figures and divides each whole into 6 parts to show a total of 30 parts (MP4z).

Total Awarded Points: 3 out of 4

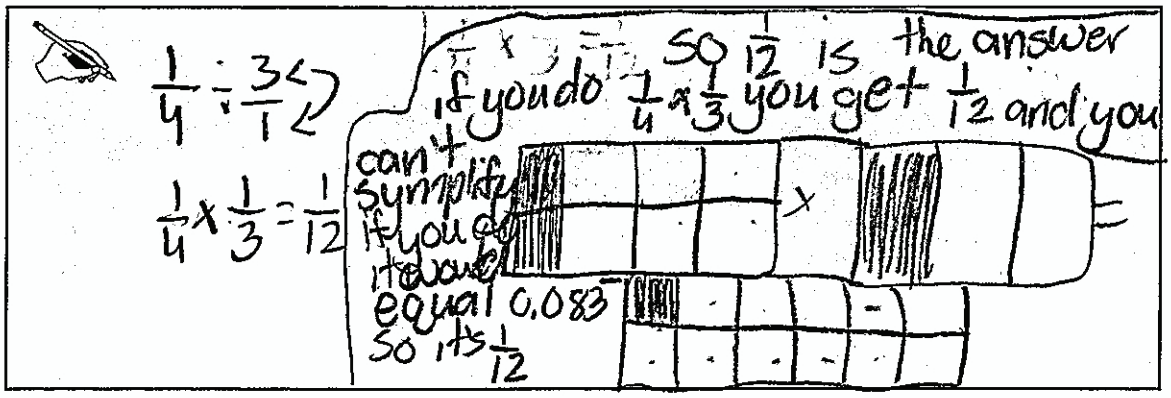
ask 4. Dividing Fractions Task

› show how you solve the problems below, choose:

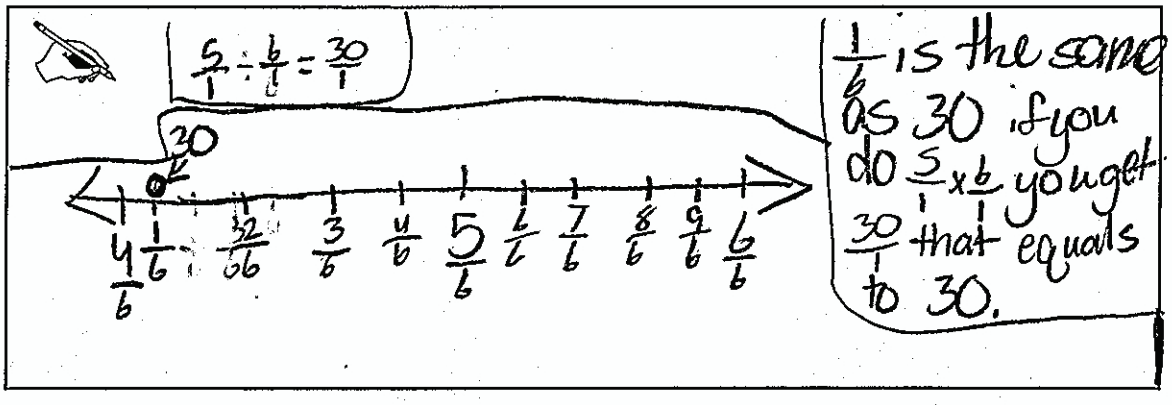
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

ɔu may choose a different model for each problem. Write the quotients for the problem in the ɔxes provided. Use the model you chose to show how you solved the problem.

$\frac{1}{4} \div 3 = \boxed{\frac{1}{12}}$



$5 \div \frac{1}{6} = \boxed{30}$



Litho#: 549506

Guide 5 Litho 549506

Total Content Points: 2 (5.NF.B.7a, 5.NF.B.7b)

Total Practice Points: 0

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). The student does not correctly model either of the expressions; the visual model in Part A does not explicitly show steps to the solution and the number line in Part B does not represent the values in the expression (no credit for MP4x, no credit for MP4z).

Total Points Awarded: 2 out of 4

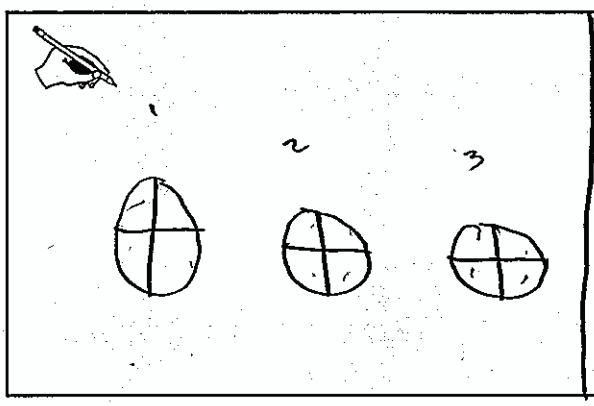
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

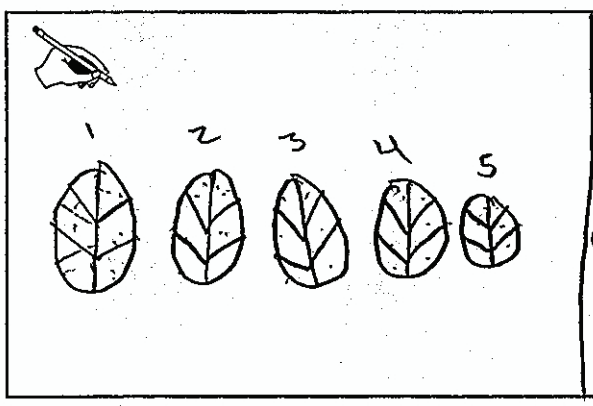
a. $\frac{1}{4} \div 3 =$ 12



I ... got this answer because when you divide fractions all you have to do is Multiply. So I took the 3 and the 4 and multiplied it and 4x3=12

b. 5 ÷ 1/6 = 30

(You could also count how many you have split it into!)



This time I used 2 methods you could count how many parts you split it into or Multiply by 5 and get 30.

Guide 6 Litho 564673

Total Content Points: 1 (5.NF.B.7b)

Total Practice Points: 1 (MP4z)

In Part A, the student does not provide the correct answer to the expression $\frac{1}{4} \div 3$ (no credit for 5.NF.B.7a); the visual model in Part A indicates reasoning related to multiplication rather than division of fractions (no credit for MP4x). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). The student uses a correct visual model for Part B, drawing 5 whole figures and dividing each whole into 6 parts to show a total of 30 parts (MP4z).

Total Awarded Points: 2 out of 4

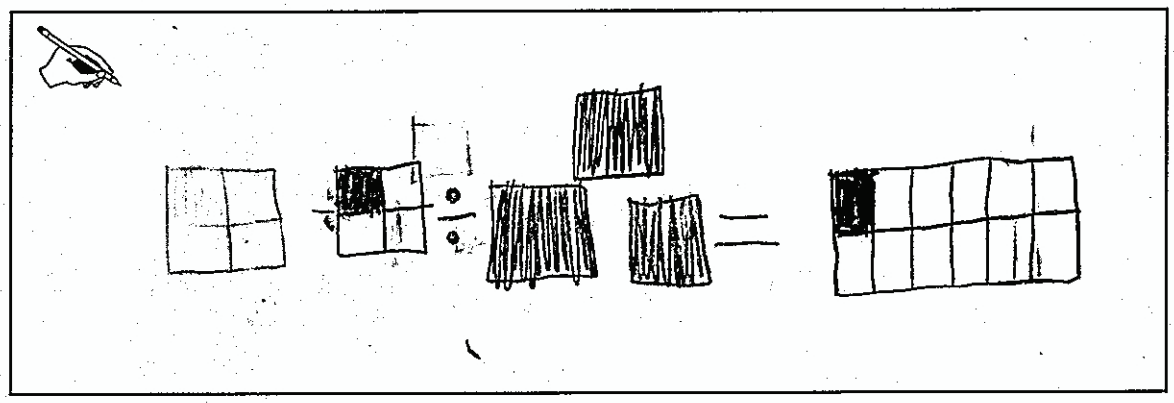
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

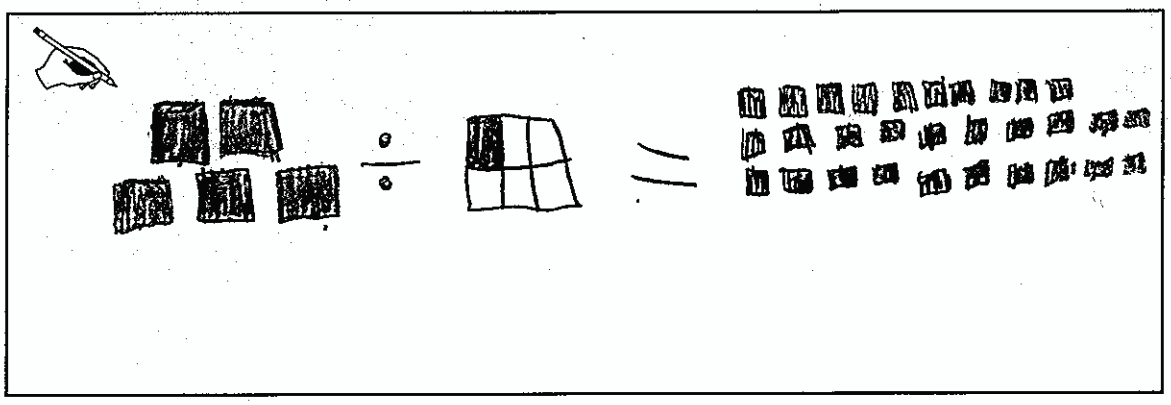
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 = \boxed{\frac{1}{12}}$



b. $5 \div \frac{1}{6} = \boxed{30}$



Litho#: 548789

Guide 7 Litho 548789

Total Content Points: 2 (5.NF.B.7a, 5.NF.B.7b)

Total Practice Points: 0

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). The student creates models in Part A and in Part B that illustrate each value from the given expressions, but the models do not indicate how the student solved either of the given expressions in Part A or Part B (no credit for MP4x, no credit for MP4z).

Total Awarded Points: 2 out of 4

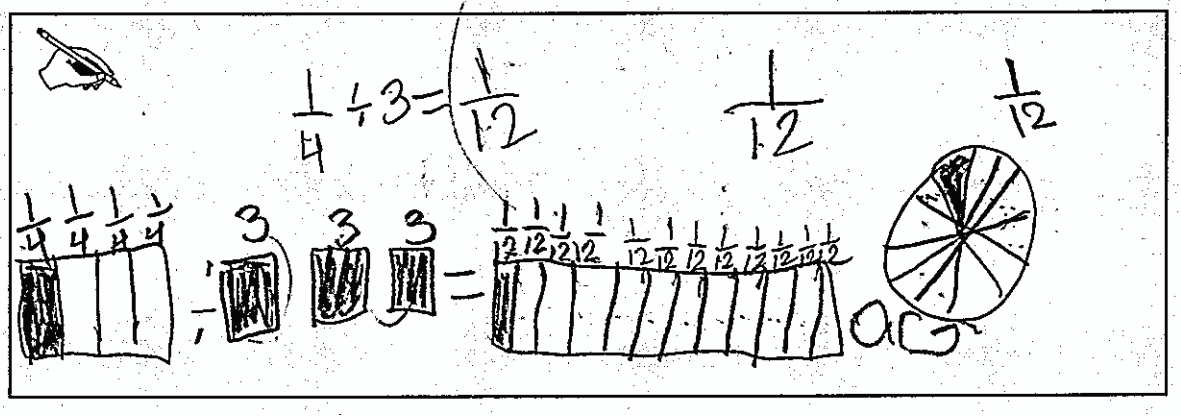
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

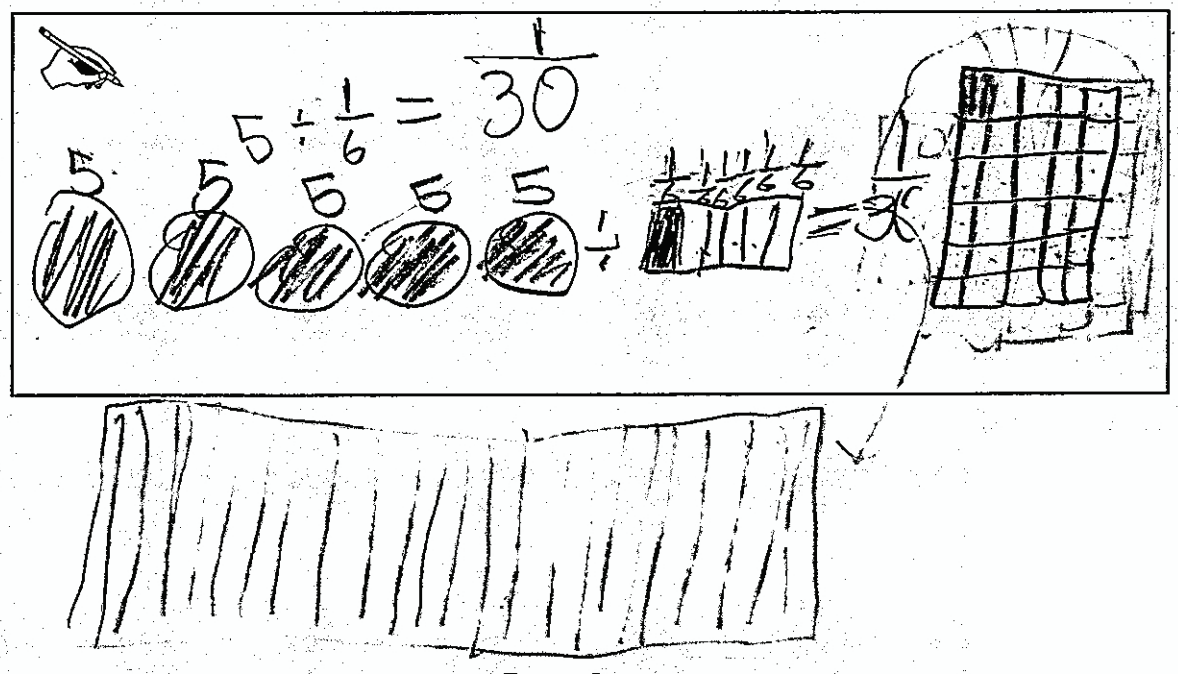
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ $\frac{1}{12}$



b. $5 \div \frac{1}{6} =$ $\frac{1}{30}$



Litho#: 579590

Guide 8 Litho 579590

Total Content Points: 1 (5.FN.B.7a)

Total Practice Points: 0

In Part A, the student provides the correct answer $\left(\frac{1}{12}\right)$ to the expression $\frac{1}{4} \div 3$, interpreting division of a unit fraction by a non-zero whole number (5.NF.B.7a). In Part B, the student does not provide the correct answer (no credit for 5.NF.B.7b). The models shown in Parts A and B indicate an ability to illustrate each individual term in the given expressions, but do not show how the student solved either expression (no credit for MP4x, no credit for MP4z).

Total Awarded Points: 1 out of 4

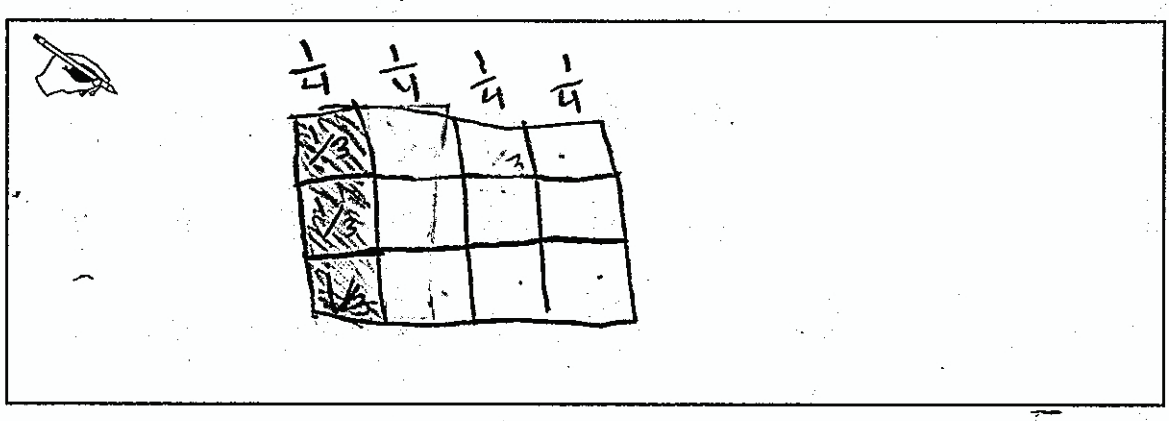
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

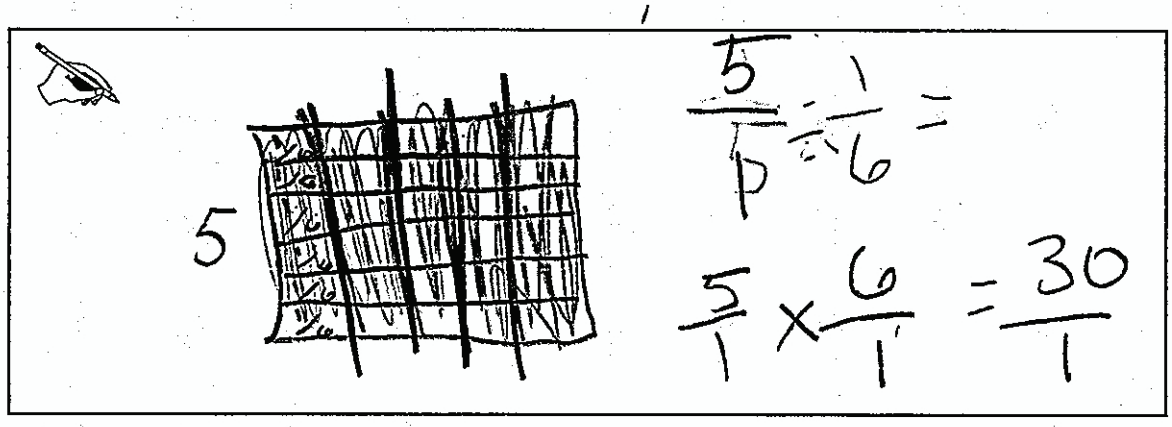
- a **number line model,** *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ $\frac{3}{12}$



b. $5 \div \frac{1}{6} =$ 30



Litho#: 540257

Guide 9 Litho 540257

Total Content Points: 1 (5.NF.B.7b)

Total Practice Points: 0

In Part A, the student does not provide the correct answer to the expression $\frac{1}{4} \div 3$ (no credit for 5.NF.B.7a). In Part B, the student provides the answer (30) to the expression $5 \div \frac{1}{6}$, interpreting division of a whole number by a unit fraction (5.NF.B.7b). The student does not correctly model the expression in Part A, and the diagram shown in Part B is incorrectly labeled, with the label of "5" not corresponding to the 5 units apparently indicated in the figure (no credit for MP4x, no credit for MP4z).

Total Awarded Points: 1 out of 4

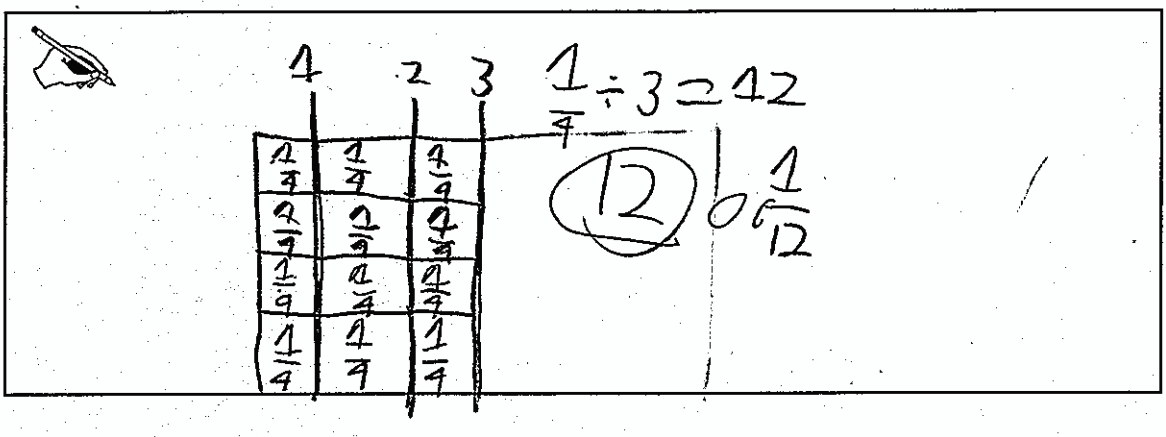
Task 4. Dividing Fractions Task

To show how you solve the problems below, choose:

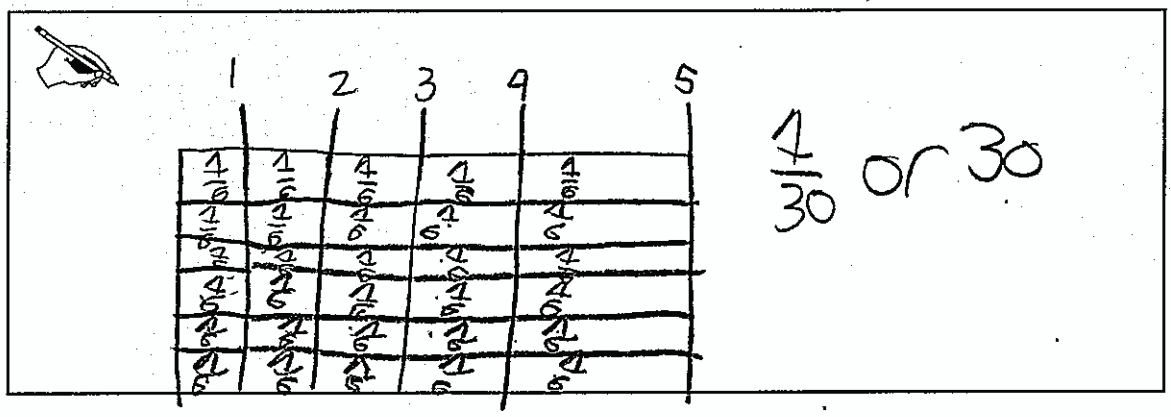
- a **number line model**, *or*
- an **area model** (for example: a circle, rectangle, or square).

You may choose a different model for each problem. Write the quotients for the problem in the boxes provided. Use the model you chose to show how you solved the problem.

a. $\frac{1}{4} \div 3 =$ ☐



b. $5 \div \frac{1}{6} =$ ☐



Litho#: 580994

Guide 10 Litho 580994

Total Content Points: 0

Total Practice Points: 1 (MP4z)

In this response, the student does not clearly indicate the correct answer to either expression. In Part A, the solution given is "12 or $\frac{1}{12}$" (no credit for 5.NF.B.7a). Similarly in Part B, the correct solution indicated is given as one of two values, but is not chosen (no credit for 5.NF.B.7b). The visual model in Part A shows 3 wholes divided into fourths (no credit for MP4x); however, the model in Part B correctly shows 5 wholes divided into sixths (MP4z).

Total Awarded Points: 1 out of 4