

Name \_\_\_\_\_

Date \_\_\_\_\_

1. Multiply or divide. Draw a model to explain your thinking.

a.  $\frac{1}{2} \times 6$

b.  $\frac{1}{2} \times 7$

c.  $\frac{3}{4} \times 12$

d.  $\frac{2}{5} \times 30$

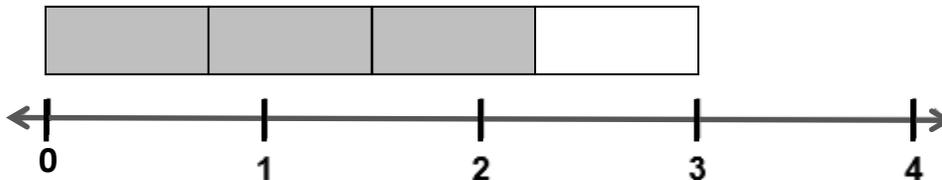
e.  $\frac{1}{3}$  of 2 feet = \_\_\_\_\_ inches

f.  $\frac{1}{6}$  of 3 yards = \_\_\_\_\_ feet

g.  $\left(3 + \frac{1}{2}\right) \times 14$

h.  $4\frac{2}{3} \times 13$

2. If the whole bar is 3 units long, what is the length of the shaded part of the bar? Write a multiplication equation for the diagram, and then solve.



3. Circle the expression(s) that are equal to  $\frac{3}{5} \times 6$ . Explain why the others are *not* equal using words, pictures, or numbers.
- a.  $3 \times (6 \div 5)$
- b.  $3 \div (5 \times 6)$
- c.  $(3 \times 6) \div 5$
- d.  $3 \times \frac{6}{5}$

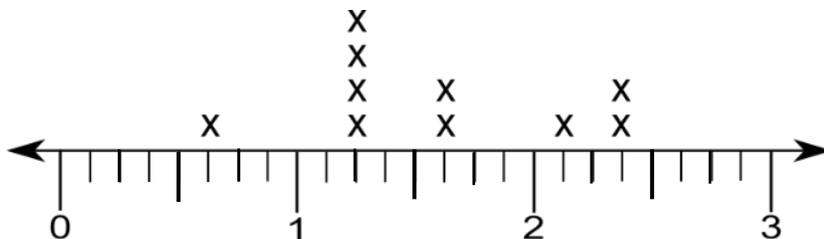
4. Write the following as expressions.

a. One-third the sum of 6 and 3.

b. Four times the quotient of 3 and 4.

c. One-fourth the difference between  $\frac{2}{3}$  and  $\frac{1}{2}$ .

5. Mr. Schaum used 10 buckets to collect rainfall in various locations on his property. The following line plot shows the amount of rain collected in each bucket in gallons. Write an expression that includes multiplication to show how to find the total amount of water collected in gallons. Then, solve your expression.



6. Mrs. Williams uses the following recipe for crispy rice treats. She decides to make  $\frac{2}{3}$  of the recipe.

2 cups melted butter  
24 oz marshmallows  
13 cups rice crispy cereal

- a. How much of each ingredient will she need? Write an expression that includes multiplication. Solve by multiplying.
- b. How many fluid ounces of butter will she use? (Use your measurement conversion chart, if you wish.)
- c. When the crispy rice treats have cooled, Mrs. Williams cuts them into 30 equal pieces. She gives two-fifths of the treats to her son and takes the rest to school. How many treats will Mrs. Williams take to school? Use any method to solve.

**Mid-Module Assessment Task  
Standards Addressed**
**Topics A–D**
**Write and interpret numerical expressions.**

- 5.OA.1** Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- 5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as  $2 \times (8 + 7)$ . Recognize that  $3 \times (18932 + 921)$  is three times as large as  $18932 + 921$ , without having to calculate the indicated sum or product.*

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

- 5.NF.3** Interpret a fraction as division of the numerator by the denominator ( $\frac{a}{b} = a \div b$ ). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret  $\frac{3}{4}$  as the result of dividing 3 by 4, noting that  $\frac{3}{4}$  multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size  $\frac{3}{4}$ . If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*
- 5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- a. Interpret the product  $(\frac{a}{b}) \times q$  as  $a$  parts of a partition of  $q$  into  $b$  parts; equivalently, as the result of a sequence of operations  $a \times q \div b$ . *For example, use a visual fraction model to show  $(\frac{2}{3}) \times 4 = \frac{8}{3}$  and create a story context for this equation. Do the same with  $(\frac{2}{3}) \times (\frac{4}{5}) = \frac{8}{15}$ . (In general,  $(\frac{a}{b}) \times (\frac{c}{d}) = \frac{ac}{bd}$ .)*
- 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.

**Convert like measurement units within a given measurement system.**

- 5.MD.1** Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

**Represent and interpret data.**

- 5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit ( $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$ ). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*

### Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what students CAN do now and what they need to work on next.

A Progression Toward Mastery				
Assessment Task Item and Standards Assessed	STEP 1 Little evidence of reasoning without a correct answer.  (1 Point)	STEP 2 Evidence of some reasoning without a correct answer.  (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer.  (4 Points)
<p><b>1</b></p> <p><b>5.NF.4a</b> <b>5.MD.1</b></p>	<p>The student draws valid models and/or arrives at the correct product for two or more items.</p>	<p>The student draws valid models and/or arrives at the correct product for at least four or more items.</p>	<p>The student draws valid models and/or arrives at the correct product for at least six or more items.</p>	<p>The student correctly answers all eight items, and draws valid models:</p> <ul style="list-style-type: none"> <li>a. 3</li> <li>b. <math>3\frac{1}{2}</math></li> <li>c. 9</li> <li>d. 12</li> <li>e. 8 inches</li> <li>f. <math>1\frac{1}{2}</math> feet</li> <li>g. 49</li> <li>h. <math>60\frac{2}{3}</math></li> </ul>
<p><b>2</b></p> <p><b>5.NF.4a</b> <b>5.NF.3</b></p>	<p>The student's work shows no evidence of being able to express the length of the shaded area.</p>	<p>The student approximates the length of the shaded bar, but does not write a multiplication equation.</p>	<p>The student is able to write the correct multiplication equation for the diagram, but incorrectly states the length of the shaded part of the bar.</p>	<p>The student correctly:</p> <ul style="list-style-type: none"> <li>▪ Writes a multiplication equation: <math>\frac{3}{4} \times 3</math>.</li> <li>▪ Finds the length of the shaded part of the bar as <math>\frac{9}{4}</math> or <math>2\frac{1}{4}</math>.</li> </ul>



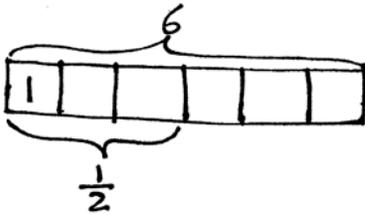
A Progression Toward Mastery				
<p><b>3</b></p> <p><b>5.OA.1</b></p>	<p>The student is unable to identify any equal expressions.</p>	<p>The student correctly identifies one correct expression.</p>	<p>The student correctly identifies two equal expressions.</p>	<p>The student correctly:</p> <ul style="list-style-type: none"> <li>Identifies (a), (c), and (d) as equal to <math>\frac{3}{5} \times 6</math>.</li> <li>Explains why (b) is not equal.</li> </ul>
<p><b>4</b></p> <p><b>5.OA.2</b></p>	<p>The student is unable to write expressions for (a), (b), or (c).</p>	<p>The student correctly writes one expression.</p>	<p>The student correctly writes two expressions.</p>	<p>The student correctly writes three expressions:</p> <p>a. <math>\frac{1}{3} \times (6 + 3)</math></p> <p>b. <math>4 \times (3 \div 4)</math> or <math>4 \times \frac{3}{4}</math></p> <p>c. <math>\frac{1}{4} \times \left(\frac{2}{3} - \frac{1}{2}\right)</math></p>
<p><b>5</b></p> <p><b>5.NF.4a</b></p> <p><b>5.NF.6</b></p> <p><b>5.MD.2</b></p>	<p>The student is neither able to produce a multiplication expression that identifies the data from the line plot nor find the total gallons of water collected.</p>	<p>The student is either able to write a multiplication expression that accounts for all data points on the line plot or find the total gallons of water collected.</p>	<p>The student's multiplication expression correctly accounts for all the data points on the line plot when finding the total gallons of water collected, but makes a calculation error.</p>	<p>The student correctly:</p> <ul style="list-style-type: none"> <li>Accounts for all data points in the line plot in the multiplication expression.</li> <li>Finds the total gallons of water collected as <math>15\frac{6}{8}</math> gallons or <math>15\frac{3}{4}</math> gallons.</li> </ul>
<p><b>6</b></p> <p><b>5.NF.4a</b></p> <p><b>5.NF.6</b></p> <p><b>5.MD.1</b></p>	<p>The student correctly calculates two correct answers.</p>	<p>The student is able to correctly calculate three correct answers.</p>	<p>The student is able to correctly calculate four correct answers.</p>	<p>The student correctly:</p> <p>a. Calculates <math>1\frac{1}{3}</math> c butter, 16 oz of marshmallows, <math>8\frac{2}{3}</math> c of cereal.</p> <p>b. Converts <math>1\frac{1}{3}</math> c butter to <math>10\frac{2}{3}</math> fluid ounces.</p> <p>c. Uses an equation or model and finds the number of treats taken to school as 18 treats.</p>

Name Hayley

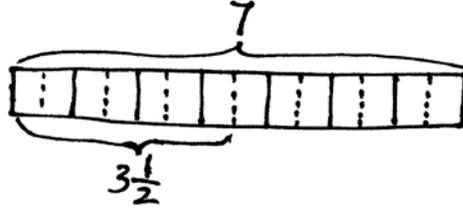
Date \_\_\_\_\_

1. Multiply or divide. Draw a model to explain your thinking.

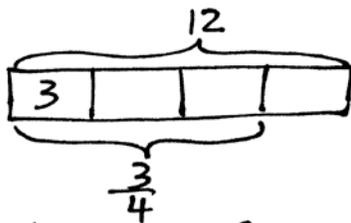
a.  $\frac{1}{2} \times 6 = 6 \div 2 = 3$



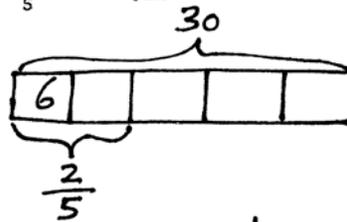
b.  $\frac{1}{2} \times 7 = 7 \div 2 = 3\frac{1}{2}$



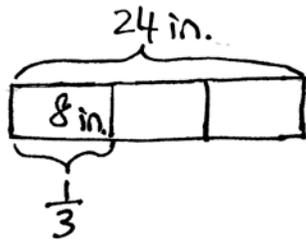
c.  $\frac{3}{4} \times 12 = 9$



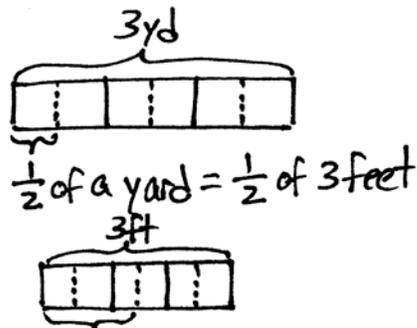
d.  $\frac{2}{5} \times 30 = 12$



e.  $\frac{1}{3}$  of 2 feet = 8 inches  
 $2 \times 12 \text{ inches} = 24 \text{ inches}$



f.  $\frac{1}{6}$  of 3 yards = 1/2 feet



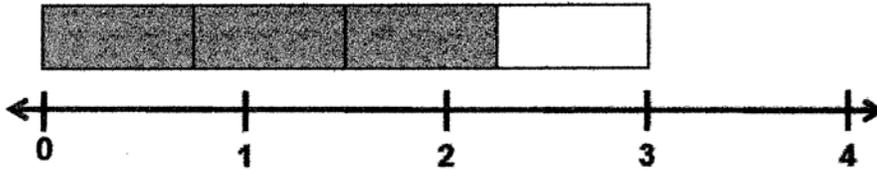
g.  $(3 + \frac{1}{2}) \times 14$

$= (3 \times 14) + (\frac{1}{2} \times 14)$   
 $= 42 + 7$   
 $= 49$

h.  $4\frac{2}{3} \times 13$

$= (4 \times 13) + (\frac{2}{3} \times 13)$   
 $= 52 + \frac{2 \times 13}{3}$   
 $= 52 + \frac{26}{3}$   
 $= 52 + 8\frac{2}{3}$   
 $= 60\frac{2}{3}$

2. If the whole bar is 3 units long, what is the length of the shaded part of the bar? Write a multiplication equation for the diagram, and then solve.



$$\frac{3}{4} \times 3 = \frac{3 \times 3}{4} = \frac{9}{4} = 2\frac{1}{4}$$

The shaded part of the bar is  $2\frac{1}{4}$  units long.

3. Circle the expression(s) that are equal to  $\frac{3}{5} \times 6$ . Explain why the others are *not* equal using words, pictures, or numbers.

a.  $3 \times (6 \div 5)$

b.  $3 \div (5 \times 6)$

$= 3 \div 30$

$= 0.1$

c.  $(3 \times 6) \div 5$

d.  $3 \times \frac{6}{5}$

4. Write the following as expressions.

a. One-third the sum of 6 and 3.

$$\frac{1}{3} \times (6 + 3)$$

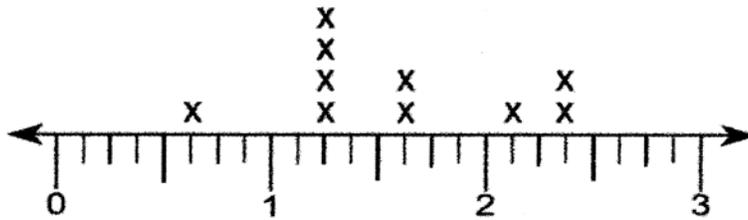
b. Four times the quotient of 3 and 4.

$$4 \times (3 \div 4)$$

c. One-fourth the difference between  $\frac{2}{3}$  and  $\frac{1}{2}$ .

$$\frac{1}{4} \times \left(\frac{2}{3} - \frac{1}{2}\right)$$

5. Mr. Schaum used 10 buckets to collect rainfall in various locations on his property. The following line plot shows the amount of rain collected in each bucket in gallons. Write an expression that includes multiplication to show how to find the total amount of water collected in gallons. Then solve your expression.



$$\begin{aligned} & \frac{5}{8} + (4 \times 1\frac{2}{8}) + (2 \times 1\frac{5}{8}) + 2\frac{1}{8} + (2 \times 2\frac{3}{8}) \\ &= \frac{5}{8} + 4 + \frac{4 \times 2}{8} + 2 + \frac{2 \times 5}{8} + 2\frac{1}{8} + 4 + \frac{2 \times 3}{8} \\ &= 12 + \frac{5}{8} + \frac{8}{8} + \frac{10}{8} + \frac{1}{8} + \frac{6}{8} \\ &= 13 + \frac{22}{8} \\ &= 15\frac{6}{8} = 15\frac{3}{4} \end{aligned}$$

Mr. Schaum collected  $15\frac{3}{4}$  gallons of water.

6. Mrs. Williams uses the following recipe for crispy rice treats. She decides to make  $\frac{2}{3}$  of the recipe.

- 2 cups melted butter
- 24 oz marshmallows
- 13 cups rice crispy cereal

a. How much of each ingredient will she need? Write an expression that includes multiplication. Solve by multiplying.

Butter:  $\frac{2}{3} \times 2 \text{ cups} = \frac{2 \times 2}{3} = \frac{4}{3} = 1\frac{1}{3} \text{ cups}$

Marshmallows:  $\frac{2}{3} \times 24 \text{ oz.} = \frac{2 \times 24}{3} = \frac{48}{3} = 16 \text{ oz.}$

Cereal:  $\frac{2}{3} \times 13 \text{ cups} = \frac{2 \times 13}{3} = \frac{26}{3} = 8\frac{2}{3} \text{ cups}$

she will need  $1\frac{1}{3}$  cups of butter, 16 ounces of marshmallows, and  $8\frac{2}{3}$  cups of rice crispy cereal.

b. How many fluid ounces of butter will she use? (Use your measurement conversion chart if you wish.)

1 cup = 8 ounces

$$1\frac{1}{3} \times 8 = (1 \times 8) + (\frac{1}{3} \times 8)$$

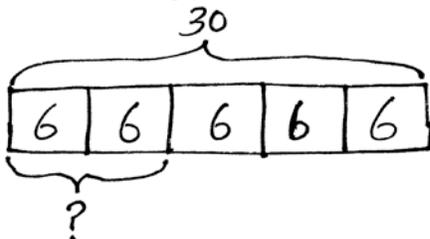
$$= 8 + \frac{8}{3}$$

$$= 8 + 2\frac{2}{3}$$

$$= 10\frac{2}{3}$$

She will use  $10\frac{2}{3}$  fluid ounces of butter.

c. When the crispy rice treats have cooled, Mrs. Williams cuts them into 30 equal pieces. She gives two-fifths of the treats to her son and takes the rest to school. How many treats will Mrs. Williams take to school? Use any method to solve.



$$\begin{array}{r} 30 \\ -12 \\ \hline 18 \end{array}$$

Mr. Williams will take 18 treats to school.