

## Multiplication and Division of Fractions Mini-Assessment

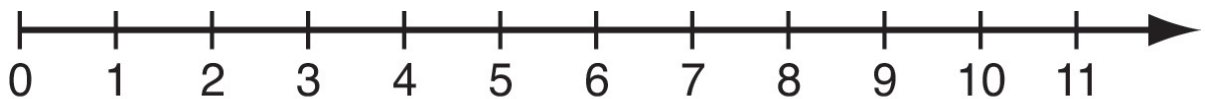
Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Circle the letter for the column having a larger value.

A	B	Circle either A or B
$\frac{5}{17} \times \frac{2}{3}$	$\frac{5}{17} \times \frac{3}{2}$	A    B
$\frac{27}{25} \times 36$	$\frac{30}{32} \times 36$	A    B
$\frac{63}{54}$	$\frac{63}{54} \times \frac{62}{54}$	A    B
$9 \times \frac{1}{3}$	$\frac{1}{3}$	A    B

2. Write  $11 \div 5$  as a fraction. Then, draw a point that shows this number on the number line diagram below.

Fraction: \_\_\_\_\_



## Multiplication and Division of Fractions Mini-Assessment

3. Write  $>$ ,  $=$ , or  $<$  to make each comparison true.

a.  $2 \div 3$  \_\_\_\_\_  $2 \div \frac{1}{3}$

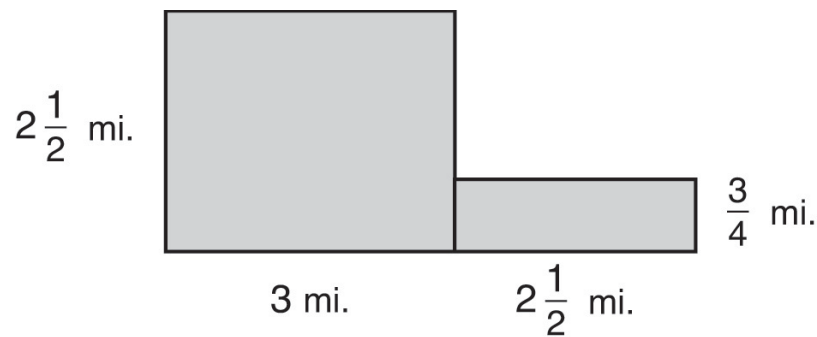
b.  $0.2 \times \frac{1}{4}$  \_\_\_\_\_  $\frac{2}{10} \times \frac{1}{3}$

c.  $\frac{1}{6} \div 4$  \_\_\_\_\_  $\frac{1}{6} \times \frac{1}{5}$

4. Create a story or diagram to show  $\frac{2}{3} \times \frac{3}{4}$ .

Compute the product of  $\frac{2}{3} \times \frac{3}{4}$ .

5. One square mile is equal to 460 acres. How many acres are in the piece of land shown in the diagram below?



Area = \_\_\_\_\_ acres

## Multiplication and Division of Fractions Mini-Assessment

6. What is the product of  $2\frac{1}{2} \times 3\frac{3}{4}$ ?

7. Fill in the blanks in the expression below to represent the following phrase:  
*2 parts when 6 is partitioned into 5 parts.*

$$\frac{2}{\square} \times \square$$

8. Order the following numbers from greatest to least.

$$\frac{5}{4} \times 15 \quad \frac{4}{3} \times 10 \quad \frac{2}{3} \times 15 \quad \frac{3}{2} \times 10$$

**Greatest:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Least:** \_\_\_\_\_

9. Tina is making  $\frac{1}{4}$  pound hamburgers. Write a **division** expression that shows the number of hamburgers she can make with 9 pounds of hamburger meat.

5.NF.B Conceptual Understanding Mini-Assessment – Multiplication and Division of Fractions  
 Answer Key & Analysis

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Circle the letter for the column having a larger number.

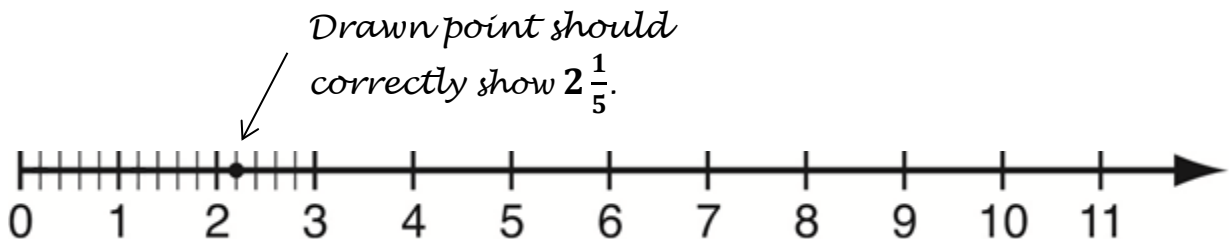
A	B	Circle either A or B
$\frac{5}{17} \times \frac{2}{3}$	$\frac{5}{17} \times \frac{3}{2}$	A <input type="radio"/> B <input checked="" type="radio"/>
$\frac{27}{25} \times 36$	$\frac{30}{32} \times 36$	<input checked="" type="radio"/> A <input type="radio"/> B
$\frac{63}{54}$	$\frac{63}{54} \times \frac{62}{54}$	A <input type="radio"/> B <input checked="" type="radio"/>
$9 \times \frac{1}{3}$	$\frac{1}{3}$	<input checked="" type="radio"/> A <input type="radio"/> B

The numbers used in these problems are intentionally “messy.” They encourage students to think about the value of the factors being multiplied (whether they are greater or less than 1) and consider the results of multiplying by fractions that are greater or less than one. Students who reason in this way will have a more manageable problem than if they actually compute each product.

In the first comparison, the first factor in column A is multiplied by an expression less than 1 while the same first factor in column B is multiplied by an expression greater than 1. Similarly, in the third comparison, the student should see the same fraction in both columns A and B, but in column B, that fraction is multiplied by an expression greater than 1, yielding a larger product. It is important to notice when students are relying on multiplying rather than seeing this structure.

2. Write  $11 \div 5$  as a fraction. Then, draw a point that shows this number on the number line diagram below.

Fraction:  $\frac{11}{5}$  OR *Equivalent*



**5.NF.B Conceptual Understanding Mini-Assessment – Multiplication and Division of Fractions  
Answer Key & Analysis**

3. Write  $>$ ,  $=$ , or  $<$  to make each comparison true.

a.  $2 \div 3 \underline{<} 2 \div \frac{1}{3}$

b.  $0.2 \times \frac{1}{4} \underline{<} \frac{2}{10} \times \frac{1}{3}$

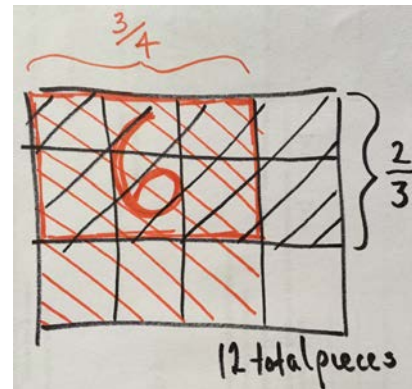
c.  $\frac{1}{6} \div 4 \underline{>} \frac{1}{6} \times \frac{1}{5}$

The numbers chosen encourage students to use reasoning strategies to compare expressions without computation. Part (a) encourages students to compare division by a whole number and division by a fraction. In part (b), students can recognize 0.2 equals  $\frac{2}{10}$ , and then compare the effect of multiplying by  $\frac{1}{4}$  and  $\frac{1}{3}$ . In part (c) students compare the effect of dividing by 4 and multiplying by  $\frac{1}{5}$ .

4. Create a story or diagram to show  $\frac{2}{3} \times \frac{3}{4}$ .

*Example Story: I had two-thirds of a candy bar left over from earlier today. I told my little brother he could have three quarters of it.*

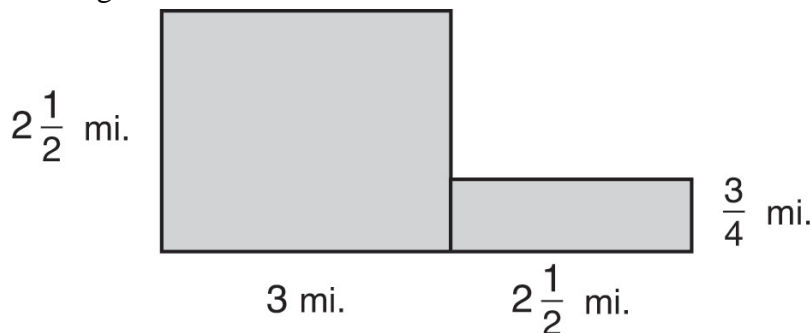
*Example Diagram:*



Compute the product of  $\frac{2}{3} \times \frac{3}{4}$ .

$\frac{6}{12}$  OR Equivalent

5. One square mile is equal to 460 acres. How many acres are in the piece of land shown in the diagram below?



This problem builds on the relationship between multiplication and area. Students may see this as the sum of two products ( $2 \frac{1}{2} \times 3 + 2 \frac{1}{2} \times \frac{3}{4}$ ) or an instance of the distributive property ( $2 \frac{1}{2} \times 3 \frac{3}{4}$ ) by reconstructing the pieces.

Area = 4,312.5 acres OR Equivalent

**5.NF.B Conceptual Understanding Mini-Assessment – Multiplication and Division of Fractions**  
**Answer Key & Analysis**

6. What is the product of  $2\frac{1}{2} \times 3\frac{3}{4}$ ?

$9\frac{3}{8}$  OR *Equivalent*

Students may recognize that this product has been solved in the previous question by the distributive property. Students who struggle with either #5 or #6 can be asked to look at the two problems together to compare what is being asked.

7. Fill in the blanks in the expression below to match the following phrase:  
*2 parts when 6 is partitioned into 5 parts.*

$$\frac{\boxed{2}}{\boxed{5}} \times \boxed{6}$$

This problem directly assesses the interpretation of a product  $\frac{a}{b} \times q$  as  $a$  parts of a partition of  $q$  into  $b$  equal parts and directly leads to a general understanding of the multiplication of two fractions as  $\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$ .

8. Order the following numbers from greatest to least.

$\frac{5}{4} \times 15$        $\frac{4}{3} \times 10$        $\frac{2}{3} \times 15$        $\frac{3}{2} \times 10$

**Greatest:**  $\frac{5}{4} \times 15$

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

$\frac{4}{3} \times 10$

**Least:**  $\frac{2}{3} \times 15$

The numbers in the expressions allow students to use reasoning about multiplication as scaling. Students should quickly see that  $\frac{5}{4} \times 15$  will be greater than  $\frac{2}{3} \times 15$  because the product will be more than 15 and the other will be less than 15. Similarly, students can reason that  $\frac{3}{2} \times 10 = 1\frac{1}{2} \times 10 = 15$ .

Although some students may compute the product of each expression, teachers can use this problem to identify which students apply reasoning when approaching fraction scaling.

9. Tina is making  $\frac{1}{4}$  pound hamburgers. Write a **division** expression that shows the number of hamburgers she can make with 9 pounds of hamburger meat.

$$9 \div \frac{1}{4}$$