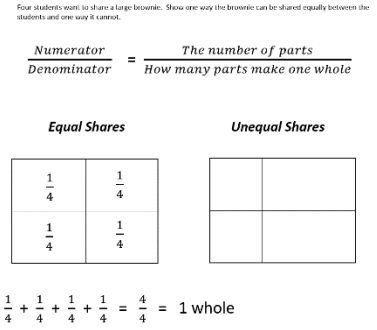
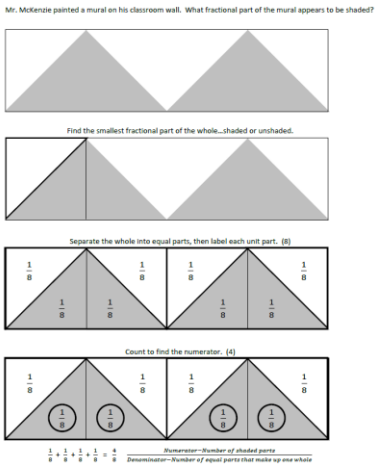
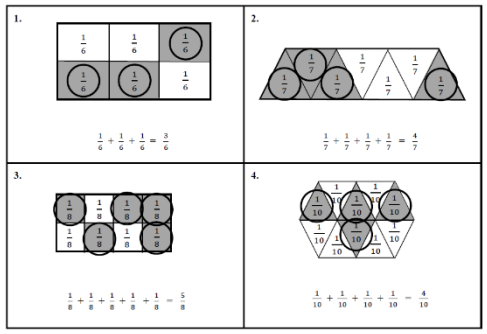
Build/Draw/Write to Understand Fractions and their Parts

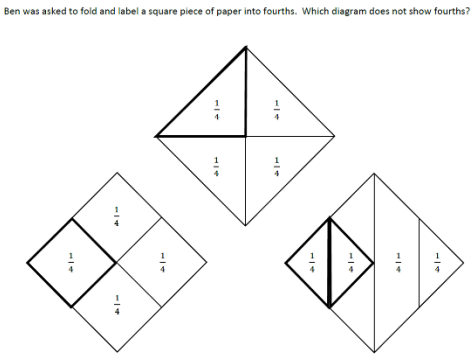
(**Note:** Different problems may be represented in each progression.)

Name fractions and their parts (3.NF.1)

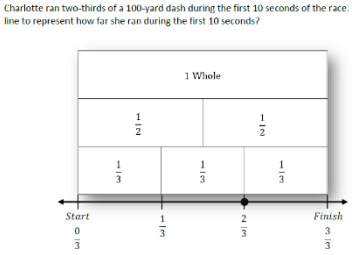


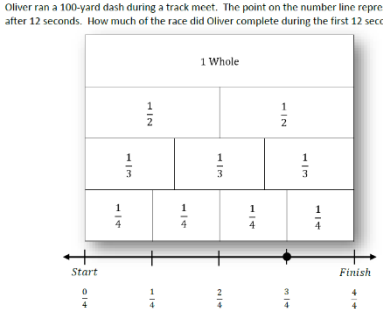


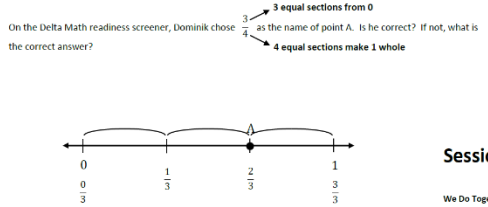


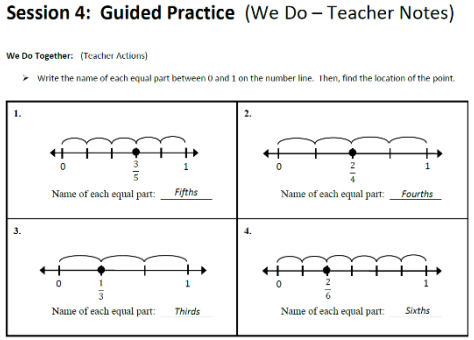


Name fractions on a number line (3.NF.2)





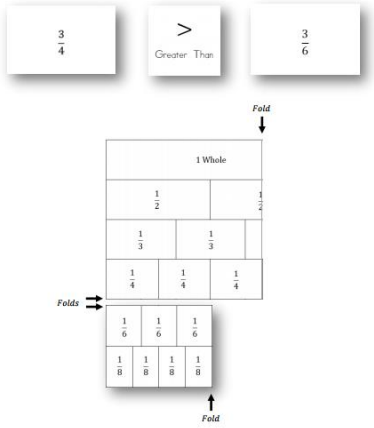


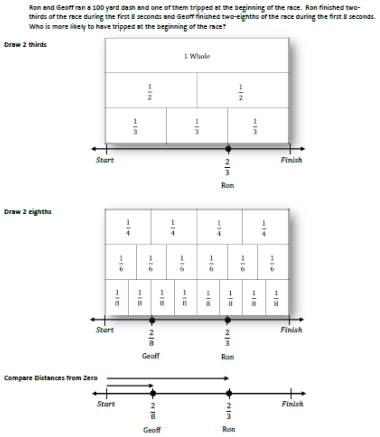


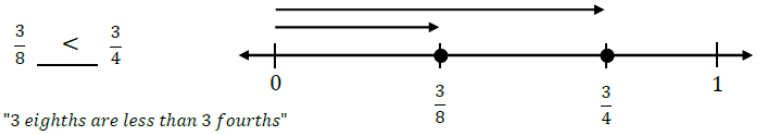
Build/Draw/Write to Compare Fractions

(Continued)

Compare fractions with the same numerator or same denominator (3.NF.3d)



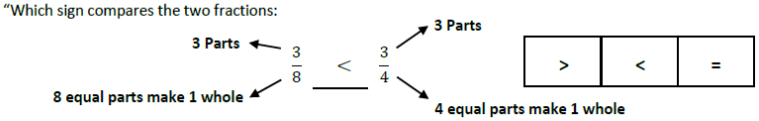




"3 eighths are less than 3 fourths"

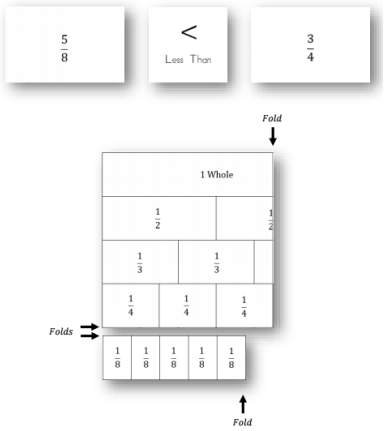
On the Delta Math readiness screener, Jarod chose ">" as the answer to the following question:

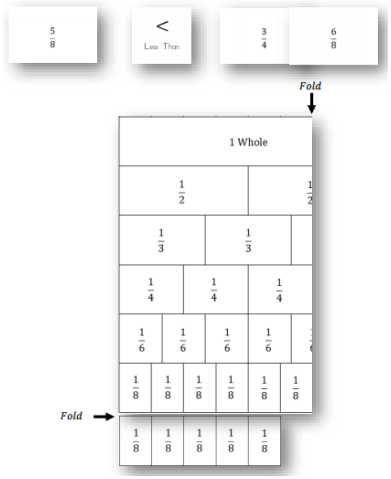
"Which sign compares the two fractions:

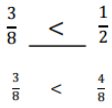


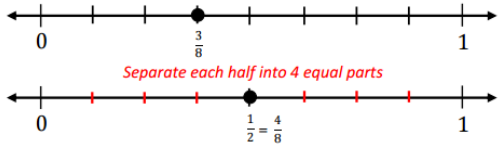
Is he correct? If not, what is the correct answer?

Compare fractions with different numerators and different denominators (4.NF.2)







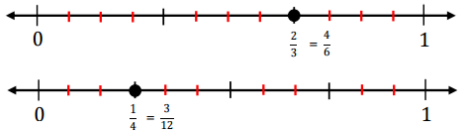


Multiply each third by 4

Multiply each fourth by 3

$\frac{8}{12} = \frac{4}{4} \times \frac{2}{3}$ > $\frac{1}{4} \times \frac{3}{3} = \frac{3}{12}$

Eight-twelfths is greater than three-twelfths

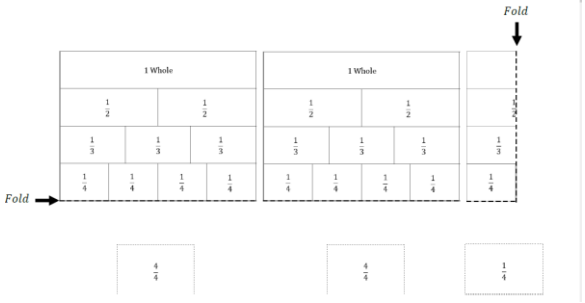


Build/Draw/Write to Understand Mixed Numbers

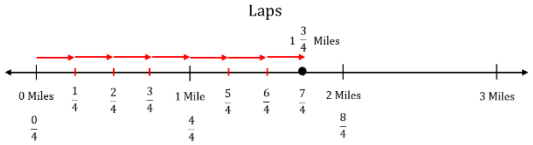
(Continued)

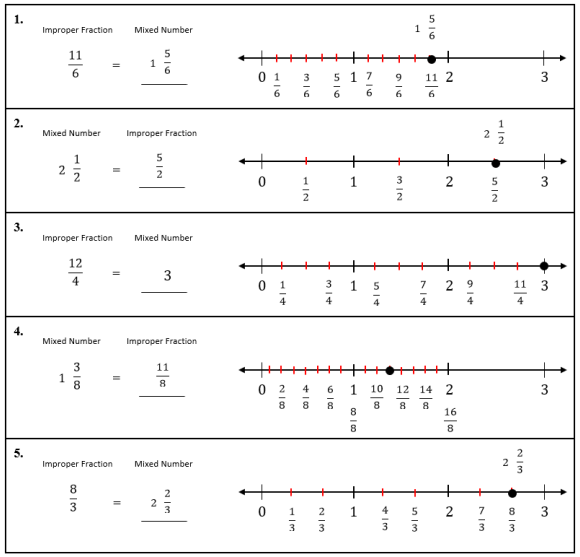
Convert between improper fractions and mixed numbers (4.NF.3b)

Gianna is baking big brownies for her birthday party. The serving size for each brownie is 1/4 of a brownie per person. If nine of her friends are invited to the party, how many brownies does she need to feed all of them?



Joe begins each track practice by jogging around the track 7 times. If each lap around the track is equal to one-quarter of a mile, how many miles does Joe run at the beginning of each practice? (Write your answer as a mixed number)

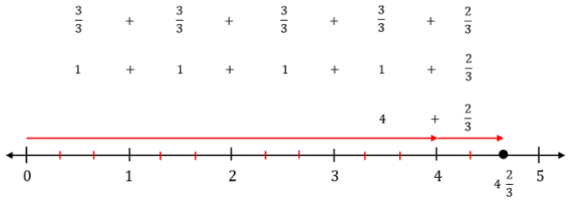




On the Delta Math readiness screener, Aubrey selected the following answer choice. Is she correct? If not, why do you think she chose her answer?

1. The mixed number $4\frac{2}{3}$ is equivalent to which expression?

- ○ $4 \times \frac{2}{3}$
- ● $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$
- ○ $3 + \frac{2}{4}$
- ○ $\frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{3}{3} + \frac{2}{3}$



Name _____ Date _____

5th Grade - RS 4 - 4.NF.3b

Learning Target: I will convert between improper fractions and mixed numbers

Session 4: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

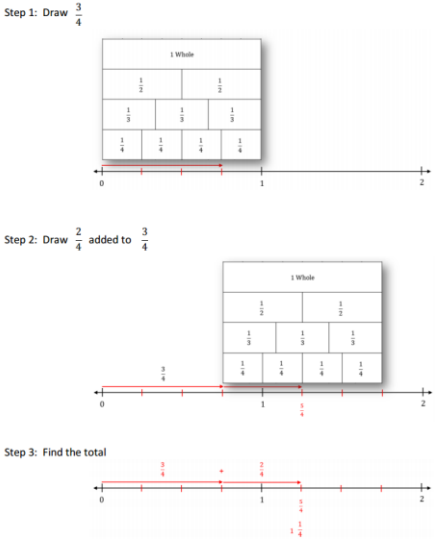
- Use your understanding of whole numbers and fractional parts to find each equivalent mixed number or improper fraction.

1. $\frac{11}{6} = \frac{6}{6} + \frac{5}{6}$ $= 1 + \frac{5}{6} = 1\frac{5}{6}$	2. $1\frac{5}{9} = 1 + \frac{5}{9}$ $= \frac{9}{9} + \frac{5}{9} = \frac{14}{9}$
3. $2\frac{1}{7} = 1 + 1 + \frac{1}{7}$ $= \frac{7}{7} + \frac{7}{7} + \frac{1}{7} = \frac{15}{7}$	4. $\frac{15}{5} = \frac{5}{5} + \frac{5}{5} + \frac{5}{5}$ $= 1 + 1 + 1 = 3$

Build/Draw/Write to Add and Subtract Mixed Numbers

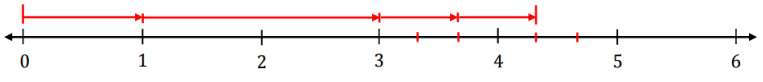
(Continued)

Add and subtract mixed numbers with like denominators (4.NF.3c)



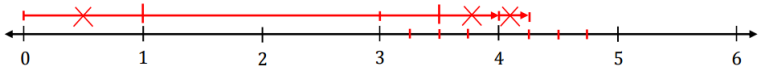
$1\frac{2}{3} + 2\frac{2}{3} = 3\frac{4}{3} = 4\frac{1}{3}$

- Draw and combine the wholes
- Draw and combine the fractional parts
- Simplify by grouping 3 of the thirds into another whole



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

- Draw the total
- Ungroup the whole between 3 and 4 to make more fourths
- Take away 3 fourths, then 1 whole
- Find how much is left and simplify 2 fourths as 1 half



$4\frac{5}{6} + 1\frac{3}{6}$

$5\frac{8}{6} = 5 + 1 + \frac{2}{6} = 6\frac{1}{3}$

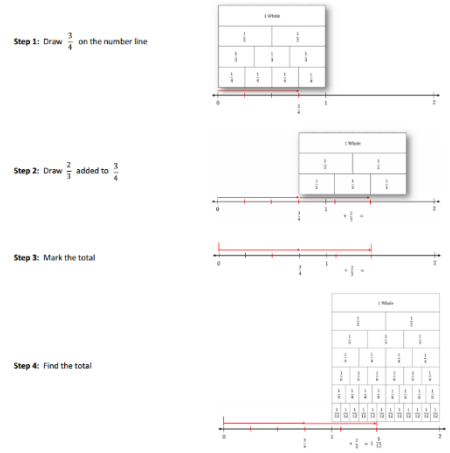
$6\frac{6}{6}$ $\frac{2}{6}$ (2 x 1, 2 x 3)

$4\frac{3}{8} - 1\frac{5}{8}$

$2\frac{11}{8}$

$1\frac{6}{8} = 1\frac{3}{4}$ (2 x 3, 2 x 4)

Add and subtract mixed numbers with different denominators (5.NF.1)

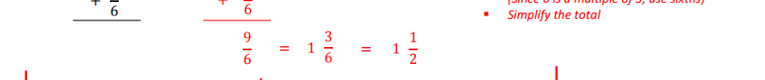


$\frac{2}{3}$ x 2, x 2 → $\frac{4}{6}$

$+\frac{5}{6}$ → $+\frac{5}{6}$

$\frac{9}{6} = 1\frac{3}{6} = 1\frac{1}{2}$

- Draw both fractional parts
- Use a common denominator to find the total (Since 6 is a multiple of 3, use sixths)
- Simplify the total



$1\frac{1}{4}$ x 2, x 2 → $\frac{2}{8}$

$-\frac{3}{8}$ → $-\frac{3}{8}$

$\frac{7}{8}$

- Draw the total
- Rewrite the problem with common denominators (Since 8 is a multiple of 4, use 8ths)
- Ungroup the whole to provide enough 8ths
- Take away the known part (3 eighths)

$1\frac{9}{10} + 2\frac{3}{5}$ (x 2, x 2)

$1\frac{9}{10} + 2\frac{6}{10}$

$3\frac{15}{10} = 4\frac{5}{10} = 4\frac{1}{2}$ (1 x 5, 2 x 5)

$9\frac{1}{4}$ (x 3, x 3) $- 5\frac{2}{3}$ (x 4, x 4)

$8\frac{15}{12}$

$- 5\frac{8}{12}$

$3\frac{7}{12}$

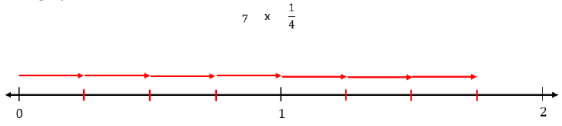
Build/Draw/Write to Multiply Fractions

(Continued)

Multiply a whole number by a fraction (4.NF.4b)

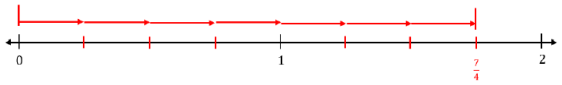
Draw 7 groups of 1-fourth

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



Identify the total

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



Simplify the total

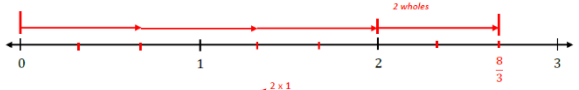
$7 \times \frac{1}{4} = \frac{7}{4} = 1\frac{3}{4}$

We Do Together: (Teacher Actions)

- Use number lines to multiply fractions by whole numbers.

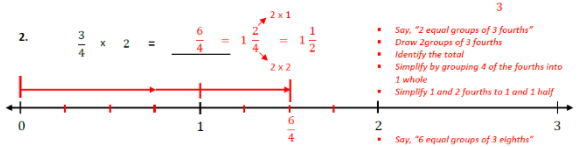
1. $4 \times \frac{2}{3} = \frac{8}{3} = 2\frac{2}{3}$

- *Say, "4 equal groups of 2 thirds"*
- *Draw 4 groups of 2 thirds*
- *Identify the total*
- *Simplify by grouping 6 of the thirds into 2 wholes*



2. $\frac{3}{4} \times 2 = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$ (2 x 1 / 2 x 2)

- *Say, "2 equal groups of 3 fourths"*
- *Draw 2groups of 3 fourths*
- *Identify the total*
- *Simplify by grouping 4 of the fourths into 1 whole*
- *Simplify 1 and 2 fourths to 1 and 1 half*



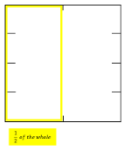
- *Say, "6 equal groups of 3 eighths"*

- Use your understanding of multiplication as repeated addition to complete each multiplication problem.

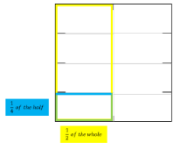
2. $5 \times \frac{2}{3} = 3\frac{1}{3}$ $\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3}+\frac{2}{3} = \frac{10}{3} = 3\frac{1}{3}$	**3.** $4 \times \frac{3}{7} = 1\frac{5}{7}$ $\frac{3}{7}+\frac{3}{7}+\frac{3}{7}+\frac{3}{7} = \frac{12}{7} = 1\frac{5}{7}$
4. $\frac{2}{5} \times 3 = 1\frac{1}{5}$ $\frac{2}{5}+\frac{2}{5}+\frac{2}{5} = \frac{6}{5} = 1\frac{1}{5}$	**5.** $\frac{3}{4} \times 2 = 1\frac{1}{2}$ $\frac{3}{4}+\frac{3}{4} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$ (2 x 1 / 2 x 2)

Multiply fractions (5.NF.4b)

Find 1 half of the whole



Find 1 fourth of the half



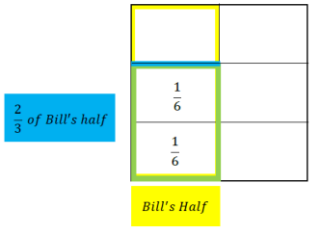
Find the part of the whole

$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$

Bill and Murray split a giant brownie in half to share. Bill ate two-thirds of his portion and Murray ate three-fourths of his portion. How much of the giant brownie did Bill eat?

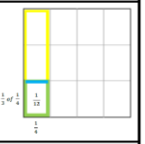
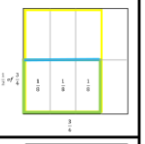
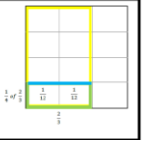
1 Whole Giant Brownie

$\frac{2}{3} \times \frac{1}{2} = \frac{2}{6} = \frac{1}{3}$ (2 x 1 / 2 x 3)



We Do Together: (Teacher Actions)

- Fold your paper to hide the math drawings. Then, multiply to find each answer and simplify, if needed.
- Use the drawing to check if your answer is correct.

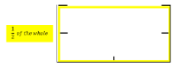
	Find the size of each part and number of parts	Check Your Work
1. $\frac{1}{3} \times \frac{1}{4}$	$\frac{1 \times 1}{3 \times 4} = \frac{1}{12}$	
2. $\frac{1}{2} \times \frac{3}{4}$	$\frac{1 \times 3}{2 \times 4} = \frac{3}{8}$	
3. $\frac{1}{4} \times \frac{2}{3}$	$\frac{1 \times 2}{4 \times 3} = \frac{2}{12} = \frac{1}{6}$ (2 x 1 / 2 x 6)	

Build/Draw/Write to Divide Whole Numbers and Fractions

(Continued)

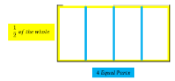
Divide a fraction by a whole number (5.NF.7a)

Fold and outline 1 half of the whole



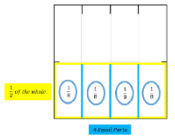
$\frac{1}{2} \div 4 =$

Find 1 fourth of the half



$\frac{1}{2} \div 4 =$

Unfold and find the part of the whole



$\frac{1}{2} \div 4 = \frac{1}{8}$

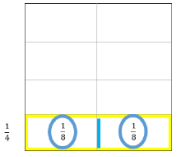
Session 3: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Restate each division problem based on your conceptual understanding.
  Example: 1 fourth equally divided 2 ways?
- Use the square guide to help you draw each problem.

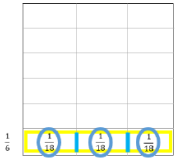
1. *1 fourth equally divided 2 ways*

$\frac{1}{4} \div 2 = \frac{1}{8}$



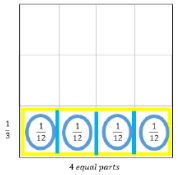
2. *1 sixth equally divided 3 ways*

$\frac{1}{6} \div 3 = \frac{1}{18}$



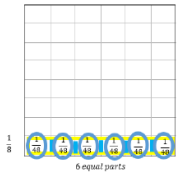
3. *1 third equally divided 4 ways*

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



4. *1 eighth equally divided 6 ways*

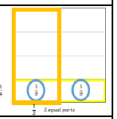
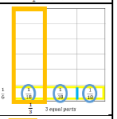
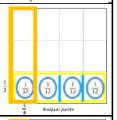
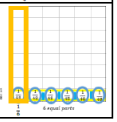
$\frac{1}{8} \div 6 = \frac{1}{48}$



Session 4: Guided Practice (We Do – Teacher Notes)

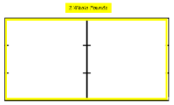
We Do Together: (Teacher Actions)

- Fold your paper to hide the math drawings. Then, multiply to find the answer to each division problem.
- Unfold your paper to check if your answer is correct.

	Divide Using Multiplication	Check Your Work
1. $\frac{1}{4} \div 2 = \frac{1}{8}$	$\frac{1}{4} \times \frac{1}{2} = \frac{1 \times 1}{4 \times 2} = \frac{1}{8}$	
2. $\frac{1}{6} \div 3 = \frac{1}{18}$	$\frac{1}{6} \times \frac{1}{3} = \frac{1 \times 1}{6 \times 3} = \frac{1}{18}$	
3. $\frac{1}{3} \div 4 = \frac{1}{12}$	$\frac{1}{3} \times \frac{1}{4} = \frac{1 \times 1}{3 \times 4} = \frac{1}{12}$	
4. $\frac{1}{8} \div 6 = \frac{1}{48}$	$\frac{1}{8} \times \frac{1}{6} = \frac{1 \times 1}{8 \times 6} = \frac{1}{48}$	

Divide a whole number by a fraction (5.NF.7b)

Outline 2 wholes



$2 \div \frac{1}{3}$

Outline parts of 1 third

$2 \div \frac{1}{3}$

Find how many parts that make 2 wholes

$2 \div \frac{1}{3} = 6$

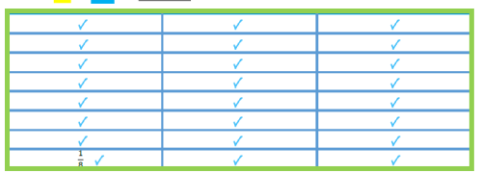
Session 3: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Restate each division problem based on your conceptual understanding.
  Example: How many groups of 1 eighth make up 3 wholes?
- Use the square guide to help you draw each problem.

1. *3 divided into groups of 1 eighth*

$3 \div \frac{1}{8} = 24$



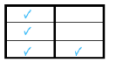
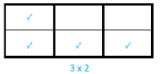
2. *2 divided into groups of 1 sixth*

$2 \div \frac{1}{6} = 12$

Session 4: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Fold your paper to hide the math drawings. Then, multiply to find the answer to each division problem.
- Unfold your paper to check if your answer is correct.

	Divide Using Multiplication	Check Your Work
1. $4 \div \frac{1}{4} =$	$4 \times \frac{4}{1} = \frac{4 \times 4}{1 \times 1} = 16$	 4 x 4
2. $3 \div \frac{1}{5} =$	$3 \times \frac{5}{1} = \frac{3 \times 5}{1 \times 1} = 15$	 3 x 5
3. $2 \div \frac{1}{3} =$	$2 \times \frac{3}{1} = \frac{2 \times 3}{1 \times 1} = 6$	 2 x 3
4. $3 \div \frac{1}{2} =$	$3 \times \frac{2}{1} = \frac{3 \times 2}{1 \times 1} = 6$	 3 x 2

Build/Draw/Write to Multiply and Divide Fractions

(Continued)

Multiply and divide fractions (6.NS.1)

Name _____ Date _____

Learning Target: I will multiply and divide fractions 7th Grade - Readiness Standard 1 - 6.NS.1

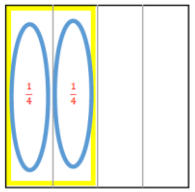
Session 2: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Restate each problem based on your conceptual understanding.
  - *Problem 1: How many groups of 1 fourth are in 1 half?*
  - *Problem 2: 1 half of 1 fourth is equal to what part of the whole?*
- Use the square guide to help you draw the fractions given in each problem.

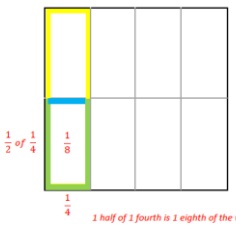
How many groups of 1 fourth are in 1 half?

1. $\frac{1}{2} \div \frac{1}{4} = 2$



1 half of 1 fourth is 1 eighth of the whole

2. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$



Name _____ Date _____

Learning Target: I will multiply and divide fractions 7th Grade - Readiness Standard 1 - 6.NS.1

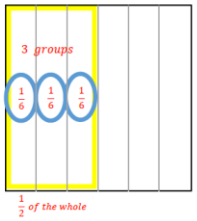
Session 3: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Rewrite and solve each problem using common denominators. Then, use an area model to verify each answer.

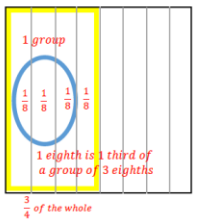
1. $\frac{3}{6} \div \frac{1}{6} = 3$ groups of 1 sixth

$\frac{1}{2} \div \frac{1}{6} = 3$



2. $\frac{4}{8} \div \frac{3}{8} = 1\frac{1}{3}$ groups of 3

$\frac{1}{2} \div \frac{3}{8} = 1\frac{1}{3}$



Name _____ Date _____

Learning Target: I will multiply and divide fractions 7th Grade - Readiness Standard 1 - 6.NS.1

Session 4: Guided Practice (We Do – Teacher Notes)

We Do Together: (Teacher Actions)

- Solve each problem using Levi's and his dad's methods.

	Divide Using Common Denominators	Multiply by the Reciprocal
1. $\frac{1}{2} \div \frac{1}{6}$	$\frac{1}{2} \overset{\times 3}{\underset{\times 3}{\div}} \frac{1}{6} = \frac{3}{6} \div \frac{1}{6} = \frac{3 \div 1}{6 \div 6} = \frac{3}{1} = 3$	$\frac{1}{2} \times \frac{6}{1} = \frac{1 \times 6}{2 \times 1} = \frac{6}{2} \overset{2 \times 3}{\underset{2 \times 1}{=}} \frac{3}{1} = 3$
2. $\frac{3}{8} \div \frac{1}{2}$	$\frac{3}{8} \div \frac{1}{2} \overset{\times 4}{\underset{\times 4}{=}} \frac{3}{8} \div \frac{4}{8} = \frac{3 \div 4}{8 \div 8} = \frac{3}{1} = \frac{3}{4}$	$\frac{3}{8} \times \frac{2}{1} = \frac{3 \times 2}{8 \times 1} = \frac{6}{8} \overset{2 \times 3}{\underset{2 \times 4}{=}} \frac{3}{4}$