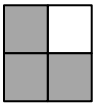
Name _____ Date _____

1. Let each small square represent $\frac{1}{4}$.

   a. Using the same unit, draw and shade the following fractions. Represent each as a sum of unit fractions.

   Example: $\frac{3}{4}$

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

   i. 1

   ii. $\frac{2}{4}$

   iii. $\frac{5}{4}$

   b. Record the decompositions of Parts (i) and (iii) using only 2 addends.

   i.

   iii.

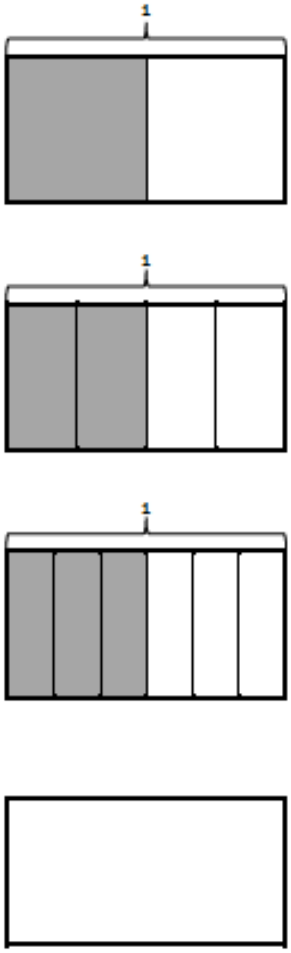
   c. Rewrite the equations from Part (a) as the multiplication of a whole number by a unit fraction.

   i.

   ii.

   iii.

2. a. Using the fractional units shown, identify the fraction of the rectangle that is shaded. Continue this pattern by drawing the next area model in the sequence and identifying the fraction shaded.



b. Use multiplication to explain why the first two fractions are equivalent.

3. Cross out the fraction that is not equivalent to the other three. Show how you know.

a. $\frac{3}{5}$ $\frac{60}{100}$ $\frac{6}{10}$ $\frac{6}{5}$

b. $\frac{6}{4}$ $\frac{3}{2}$ $\frac{12}{8}$ $\frac{8}{4}$

c. $\frac{6}{4}$ $\frac{16}{12}$ $\frac{9}{6}$ $\frac{3}{2}$

4. Fill in the circle with <, =, or > to make a true number sentence. Justify each response by drawing a model (such as an area model or number line), creating common denominators or numerators, or explaining a comparison to a benchmark fraction.

a. $\frac{6}{5} \bigcirc \frac{4}{5}$

b. $\frac{5}{8} \bigcirc \frac{5}{10}$

c. $\frac{5}{5} \bigcirc \frac{12}{12}$

d. $\frac{5}{12} \bigcirc \frac{6}{10}$

e. $\frac{5}{6} \bigcirc \frac{3}{4}$

f. $\frac{8}{3} \bigcirc \frac{16}{6}$

g. $\frac{7}{4} \bigcirc \frac{9}{5}$

h. $\frac{12}{8} \bigcirc \frac{11}{6}$

5. Fill in the blanks to make each number sentence true. Draw a number line, tape diagram, or area model to represent each problem.

a. _____ $= \frac{5}{12} + \frac{6}{12}$

b. $\frac{53}{100} - \frac{27}{100} =$ _____

c. $\frac{8}{12} +$ _____ $= 1$

d. $\frac{3}{10} + \frac{6}{10} + \frac{2}{10} =$ _____

e. $1 - \frac{5}{8} =$ _____

f. $\frac{7}{8} - \frac{3}{8} =$ _____

6. Ray, Robin, and Freddy went fishing.

   a. They spent $\frac{1}{6}$ of their money on water, $\frac{4}{6}$ of their money on lunch, and the rest on worms. What fraction of their money was spent on worms? Draw a model and write an equation to solve.

   b. Robin noticed her water bottle was $\frac{1}{2}$ full and Freddy's was $\frac{3}{4}$ full. Robin said, "My $\frac{1}{2}$ full bottle has more water than your $\frac{3}{4}$ full bottle." Explain how $\frac{1}{2}$ bottle could be more than $\frac{3}{4}$ bottle.

   c. Ray, Robin, and Freddy each had identical containers of worms. Ray used $\frac{3}{8}$ container. Robin used $\frac{6}{8}$ container, and Freddy used $\frac{7}{8}$ container. How many total containers of worms did they use?

   d. Express the number of remaining containers as a product of a whole number and a unit fraction.

   e. Six out of the eight fish they caught were trout. What is another fraction equal to 6 eighths? Write a number sentence and draw a model to show the two fractions are equal.

Mid-Module Assessment Task Standards Addressed	Topics A–D

Extend understanding of fraction equivalence and ordering.

4.NF.1 Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions by applying and extending previous understandings of operations of whole numbers.

4.NF.3 Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8*.

d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

a. Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*

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 students is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the 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)**
1 **4.NF.3ab** **4.NF.4a**	The student correctly answers fewer than four of the eight parts.	The student correctly answers four or five of the eight parts.	The student correctly answers six or seven of the eight parts.	The student correctly does the following: a. Draws and shades to represent the three given fractions and represents each as a sum of unit fractions: i. $1 = \frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$ ii. $\frac{2}{4} = \frac{1}{4}+\frac{1}{4}$ iii. $\frac{5}{4} = \frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$ b. Records the decomposition using two addends. (Answers may vary.) i. $1 = \frac{3}{4} + \frac{1}{4}$ iii. $\frac{5}{4} = \frac{3}{4} + \frac{2}{4}$ c. Rewrites equations as multiplication of a whole number: i. $1= 4 \times \frac{1}{4}$ ii. $\frac{2}{4}= 2 \times \frac{1}{4}$ iii. $\frac{5}{4}= 5 \times \frac{1}{4}$

A Progression Toward Mastery				
2 **4.NF.1**	The student is unable to correctly complete a majority of the problem.	The student is able to correctly identify the fractions naming the three given models but is unable to complete the next model in the sequence and does not correctly explain equivalence using multiplication.	The student is able to correctly identify the fractions naming the three given models and is able to create the next model, as well as identify the appropriate fraction, but offers an incomplete explanation as to why the first two fractions are equivalent.	The student correctly does the following: a. Identifies the shaded fractions as $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ and creates a correct model to represent $\frac{4}{8}$. b. Uses multiplication to explain why $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent: $\frac{1\times 2}{2\times 2}=\frac{2}{4}$
3 **4.NF.1**	The student is not able to correctly identify any of the non-equivalent fractions. Explanation or modeling is inaccurate.	The student correctly identifies one of the three non-equivalent fractions. Explanation or modeling is incomplete, or student does not attempt to show work.	The student correctly identifies two of the three non-equivalent fractions. Explanation or modeling is mostly complete.	The student correctly identifies all three of the non-equivalent fractions and gives complete explanations: a. $\frac{6}{5}$ b. $\frac{8}{4}$ c. $\frac{16}{12}$
4 **4.NF.2**	The student correctly compares three or fewer of the fraction sets with little to no reasoning.	The student correctly compares four or five of the fraction sets with some reasoning.	The student correctly compares six or seven of the fraction sets with solid reasoning. Or the student correctly compares all fraction sets with incomplete reasoning on one or two parts.	The student correctly compares all eight of the fraction sets and justifies all answers using models, common denominators or numerators, or benchmark fractions: a. > b. > c. = d. < e. >> f. = g. < h. <

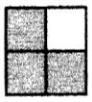
A Progression Toward Mastery				
5 **4.NF.3a**	The student correctly completes two or fewer number sentences and does not accurately use models to represent a majority of the problems.	The student correctly completes three number sentences with some accurate modeling to represent the problems.	The student correctly completes four or five number sentences with accurate modeling to represent problems. Or the student correctly completes all number sentences with insufficient models on one or two problems.	The student correctly completes all six number sentences and accurately models each problem using a number line, tape diagram, or area model: a. $\frac{11}{12}$ b. $\frac{26}{100}$ c. $\frac{4}{12}$ d. $\frac{11}{10}$ e. $\frac{3}{8}$ f. $\frac{4}{8}$
6 **4.NF.1** **4.NF.2** **4.NF.3abd** **4.NF.4a**	The student correctly completes fewer than three of the five parts with little to no reasoning.	The student correctly completes three of the five parts, providing some reasoning in Part (a), (b), or (c).	The student correctly completes four of the five parts. Or the student correctly completes all five parts but without solid reasoning in Part (a), (b), or (c).	The student correctly completes all four of the parts: a. Answers $\frac{1}{6}$ and writes an equation and draws a model. b. Accurately explains through words and/or pictures that the two fractions in question refer to two different size wholes. The water bottle that is half full could be a larger bottle. c. Answers $\frac{16}{8}$ or 2 containers. d. Answers $\frac{8}{8} = 8 \times \frac{1}{8}$. e. Answers $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$ and uses a tape diagram, number line, or area model to model the division.

Name Jack Date _____

1. Let each small square represent $\frac{1}{4}$.

   a. Using the same unit, draw and shade the following fractions. Represent each as a sum of unit fractions.

Example: $\frac{3}{4}$



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

i. 1

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

ii. $\frac{2}{4}$

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

iii. $\frac{5}{4}$

$\frac{5}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$

   b. Record the decompositions of Parts (i) and (iii) using only 2 addends.

i. $1 = \frac{2}{4} + \frac{2}{4}$

iii. $\frac{5}{4} = \frac{2}{4} + \frac{3}{4}$

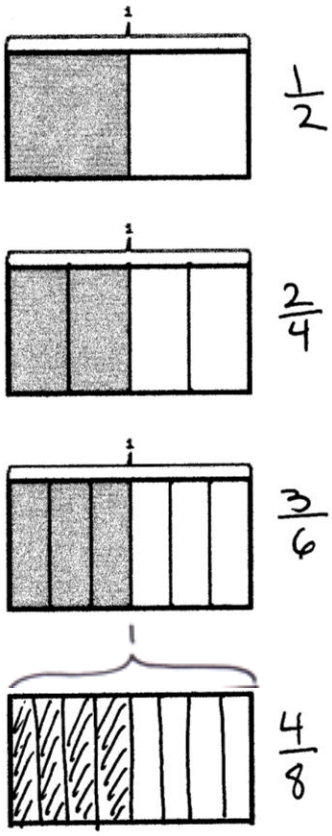
   c. Rewrite the equations from Part (a) as the multiplication of a whole number by a unit fraction.

i. $1 = 4 \times \frac{1}{4}$

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

iii. $\frac{5}{4} = 5 \times \frac{1}{4}$

2. a. Using the fractional units shown, identify the fraction of the rectangle that is shaded. Continue this pattern by drawing the next area model in the sequence and identifying the fraction shaded.



$\frac{1}{2}$

$\frac{2}{4}$

$\frac{3}{6}$

$\frac{4}{8}$

b. Use multiplication to explain why the first two fractions are equivalent.

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

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

3. Cross out the fraction that is not equivalent to the other three. Show how you know.

a. $\frac{3}{5}$ $\frac{60}{100}$ $\frac{6}{10}$ ~~$\frac{6}{5}$~~

$\frac{3 \times 20}{5 \times 20} = \frac{60}{100}$

$\frac{6 \times 10}{10 \times 10} = \frac{60}{100}$

$\frac{3}{5}$ does not equal $\frac{6}{5}$

b. $\frac{6}{4}$ $\frac{3}{2}$ $\frac{12}{8}$ ~~$\frac{8}{4}$~~

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

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

$\frac{6}{4}$ does not equal $\frac{8}{4}$

c. $\frac{6}{4}$ ~~$\frac{6}{12}$~~ $\frac{9}{6}$ $\frac{3}{2}$

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

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

$\frac{3 \times 6}{2 \times 6} = \frac{18}{12}$ $\frac{18}{12}$ does not equal $\frac{16}{12}$

4. **Fill in the circle with <, =, or > to make a true number sentence. Justify each response by drawing a model (such as an area model or number line), creating common denominators or numerators, or explaining a comparison to a benchmark fraction.**

a. $\frac{6}{5} \bigcirc \frac{4}{5}$

$\frac{6}{5} > \frac{4}{5}$

Six fifths is more than four fifths.

b. $\frac{5}{8} \bigcirc \frac{5}{10}$

$\frac{5}{8} > \frac{5}{10}$

With the same size whole, tenths are smaller than eighths. Five tenths are less than five eighths.

c. $\frac{5}{5} \bigcirc \frac{12}{12}$

$\frac{5}{5} = \frac{12}{12}$

Both fractions are equal to 1 whole.

d. $\frac{5}{12} \bigcirc \frac{6}{10}$

$\frac{5}{12} < \frac{6}{10}$

$\frac{5}{12}$ is less than $\frac{1}{2}$.

$\frac{6}{10}$ is greater than $\frac{1}{2}$.

e. $\frac{5}{6} \bigcirc \frac{3}{4}$

$\frac{5}{6} > \frac{3}{4}$

$\frac{5}{6}$ is only $\frac{1}{6}$ from one whole.

$\frac{3}{4}$ is $\frac{1}{4}$ from one whole, so

$\frac{5}{6} > \frac{3}{4}$ since $\frac{5}{6}$ is closer to one whole.

f. $\frac{8}{3} \bigcirc \frac{16}{6}$

$\frac{8}{3} = \frac{16}{6}$

$\frac{8 \times 2}{3 \times 2} = \frac{16}{6}$

g. $\frac{7}{4} \bigcirc \frac{9}{5}$

$\frac{7}{4} < \frac{9}{5}$

$\frac{4}{4}$ $\frac{3}{4}$ $\frac{5}{5}$ $\frac{4}{5}$

$\frac{3}{4}$ is $\frac{1}{4}$ from one whole.

$\frac{4}{5}$ is $\frac{1}{5}$ from one whole.

$\frac{3}{4} < \frac{4}{5}$ since $\frac{3}{4}$ is further from one whole.

h. $\frac{12}{8} \bigcirc \frac{11}{6}$

$\frac{12}{8} < \frac{11}{6}$

$\frac{12}{8} = 1\frac{4}{8} = 1\frac{1}{2}$

$\frac{4}{8}$ $\frac{4}{8}$

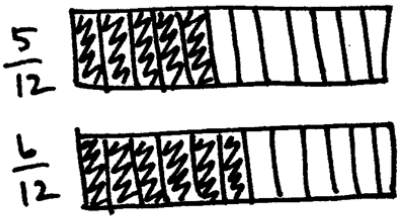
$\frac{11}{6} = 1\frac{5}{6}$

$\frac{6}{6}$ $\frac{5}{6}$

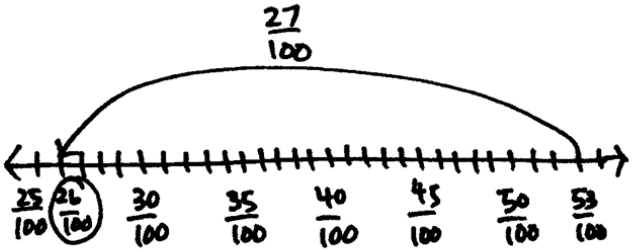
$\frac{5}{6}$ is closer to 1 whole than $\frac{1}{2}$.

5. Fill in the blanks to make each number sentence true. Draw a number line, tape diagram, or area model to represent each problem.

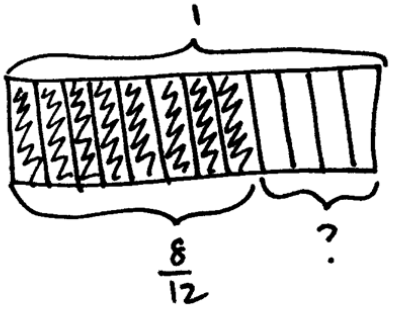
a. $\frac{11}{12} = \frac{5}{12} + \frac{6}{12}$



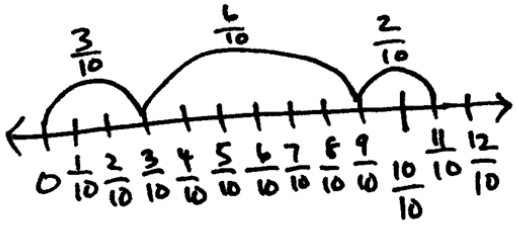
b. $\frac{53}{100} - \frac{27}{100} = \frac{26}{100}$



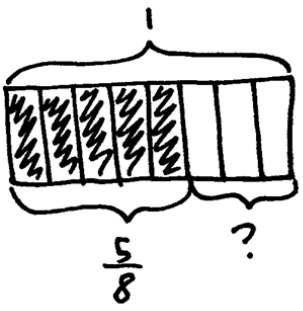
c. $\frac{8}{12} + \frac{4}{12} = 1$



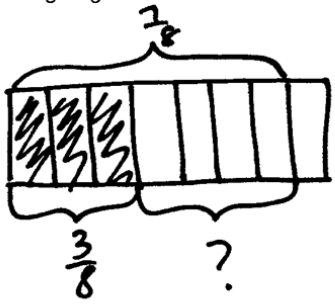
d. $\frac{3}{10} + \frac{6}{10} + \frac{2}{10} = \frac{11}{10}$



e. $1 - \frac{5}{8} = \frac{3}{8}$ $\frac{8}{8} - \frac{5}{8} = ?$

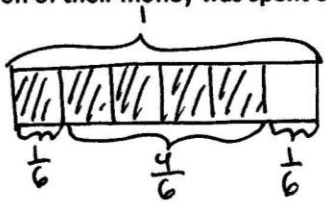


f. $\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$



6. **Ray, Robin, and Freddy went fishing.**

   a. **They spent $\frac{1}{6}$ of their money on water, $\frac{4}{6}$ of their money on lunch, and the rest on worms. What fraction of their money was spent on worms? Draw a model and write an equation to solve.**



$\frac{1}{6} + \frac{4}{6} + \frac{1}{6} = \frac{6}{6} = 1$

They spent $\frac{1}{6}$ of their money on worms.

   b. **Robin noticed her water bottle was $\frac{1}{2}$ full and Freddy's was $\frac{3}{4}$ full. Robin said, "My $\frac{1}{2}$ full bottle has more water than your $\frac{3}{4}$ full bottle." Explain how $\frac{1}{2}$ bottle could be more than $\frac{3}{4}$ bottle.**

If Robin's water bottle was bigger than Freddy's, half of her water bottle could be more than $\frac{3}{4}$ of his.

   c. Ray, Robin, and Freddy each had identical containers of worms. Ray used $\frac{3}{8}$ container. Robin used $\frac{6}{8}$ container, and Freddy used $\frac{7}{8}$ container. How many total containers of worms did they use?

$\frac{3}{8} + \frac{6}{8} + \frac{7}{8} = \frac{16}{8} = 2$

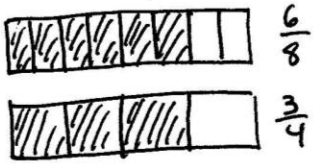
They used 2 containers of worms.

   d. **Express the number of remaining containers as a product of a whole number and a unit fraction.**

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

   e. **Six out of the eight fish they caught were trout. What is another fraction equal to 6 eighths? Write a number sentence and draw a model to show the two fractions are equal.**

$\frac{6}{8} = \frac{3}{4}$



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