

**Math Lessons for Alaska
State Standards**

Grade 4

Mastery Packet 6

Lesson 10

**Lesson Time- approximately 60
minutes**

Teacher Materials

see materials for fractions tool kits

Student Materials

student forms for this lesson

Vocabulary

numerator, denominator, improper fraction

PERFORMANCE STANDARDS

A3.2.5 Find equivalent fractions. Convert between fractions and mixed numbers.

(Bold area above is the performance standard or standard area being addressed in the lessons.)

Skill

- **Finding equivalent fractions**
- **Converting between fractions and mixed numbers**

Guided Practice

Fractions Tool Kits

Divide students into groups of four to create fractions tool kits. Provide each group with scissors, rulers, and eight 12 inch x 18 inch sheets of construction paper: one each of red, light blue, dark blue, light green, dark green, yellow, pink, and white. Guide student through the following steps.

Part I:

1. Distribute the eight sheets of construction paper so that each person in your group has two sheets.
2. Fold each sheet in half vertically and crease. Reopen each sheet and cut along the crease.
3. Fold each of these four strips in half vertically and crease. Reopen each one and cut along the crease.
4. Distribute the paper strips to your group so that each student has eight strips—one of each color.

Part II: (Each student completes these steps):

1. Label the red paper strip 1 Whole.
2. Fold the light blue strip in half. Unfold and cut on the crease. Label each piece $1/2$.
3. Fold the light green strip in half twice. Unfold and cut on the creases. Label each of the four pieces $1/4$.
4. Make fourths with the yellow strip. Then fold each fourth in half and crease. Unfold and cut each one on the crease. Label each of the eight pieces $1/8$.
5. Make eighths with the pink strip. Then fold each eight in half and crease. Unfold and cut each on the crease. Label each of the 16 pieces $1/16$.

Part III:

1. Use the dark blue, dark green and white strips to make thirds, sixths, and twelfths. Measure and draw a line on each strip at six inches and 12 inches. Then cut each strip into three pieces.
2. Label each dark blue piece $1/3$.
3. Fold each dark green piece in half and crease. Unfold and cut each one on the crease. Label each of the six pieces $1/6$.
4. Make sixths with the white strip. Fold each sixth in half and crease. Unfold and cut each on the crease. Label each of the 12 pieces $1/12$.

Provide each student with a large Ziploc bag in which to store all the fraction kit pieces.

Student Practice

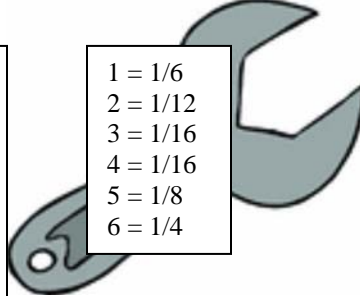
Name _____ Date _____

Using Your Fraction Tool Kit

Pair up with a partner to play each game below. You'll need two fraction kits and a die.

Game 1: Race To A Whole

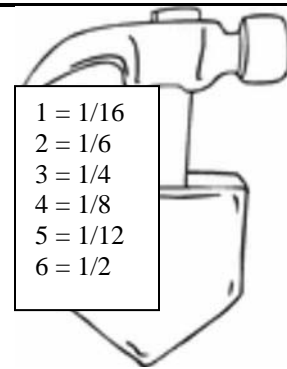
1. Place 1 whole between players.
2. Each player rolls the die. The higher roll is Player 1.
3. Player 1 rolls the die and reads the matching fraction on the wrench.
4. Player 1 places that fractions piece beside the whole.
5. Player 2 rolls the die and reads the matching fraction.
6. Player 2 places that fraction piece on the other side of the whole.
7. Continue play by adding fraction pieces in a race to reach one whole.
8. When a player is near one whole, he can freeze.
9. The winner is the player who is closer to one whole, without going over.



- 1 = 1/6
- 2 = 1/12
- 3 = 1/16
- 4 = 1/16
- 5 = 1/8
- 6 = 1/4

Game 2: Race To 2 Wholes

1. Place the two wholes end to end and between players.
2. Each player rolls the die. The higher roll is Player 1.
3. Player 1 rolls the die and reads the matching fraction on the hammer.
4. Player 1 places that fraction beside the first whole.
5. Player 2 rolls the die and reads the matching fraction.
6. Player 2 places the fraction on the other side of the first whole.
7. Continue play by adding fraction pieces in a race to reach two wholes.
8. When a player is near two wholes, she can freeze.
9. The winner is the player who is closer to two wholes, without going over.



- 1 = 1/16
- 2 = 1/6
- 3 = 1/4
- 4 = 1/8
- 5 = 1/12
- 6 = 1/2

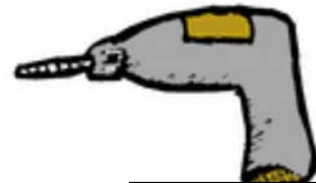
Game 3: Layer by Layer

The object of this game is to be the first player to stack all eight layers of the fractions pieces on top of the whole.

- For example, if 1/4 is placed on the whole first, then the entire first layer must be made up of fourths.
- A smaller fraction can be placed on a larger one. If 1/8 is rolled after 1/4, then it can be placed on top of 1/4 to begin a new layer.
- A large fraction can only be placed on top of an equal group of smaller fractions. For example, 1/6 can be placed on top of two 1/12 pieces.
- If a fraction cannot be placed, then that player loses his turn.

To play:

1. Place the two wholes between players.
2. Each player rolls the die. The higher roll is Player 1.
3. Player 1 rolls the die and reads the matching fractions on the drill.
4. Player 1 chooses one of the two fractions.
5. Player 1 places that fraction piece on top of his whole strip, lined up at the end.
6. Player 2 repeats Steps 3, 4, and 5.
7. Play continues alternately until a player has made all eight layers.



- 1 = 1/2 or 1/12
- 2 = 1/4 or 1/16
- 3 = 1/12 or 1/6
- 4 = 1/16 or 1/8
- 5 = 1/8 or 1/6
- 6 = 1/3 or 1/16

Student Practice

Name _____ Date _____

Stop at Bingo Equivalent Fractions

Directions: Work the problems below in any order. Find your answer on the Bingo card and circle it.

Keep working on the problems until you have a Bingo—that is five circled answers in a line, horizontally, vertically, or diagonally.

As soon as you find the Bingo, you can stop your work!

For each fraction below, there is an equivalent fraction on the Bingo card.

- | | | |
|------------------|-------------------|-------------------|
| 1. $\frac{1}{3}$ | 6. $\frac{2}{9}$ | 11. $\frac{1}{8}$ |
| 2. $\frac{1}{4}$ | 7. $\frac{1}{5}$ | 12. $\frac{1}{9}$ |
| 3. $\frac{1}{6}$ | 8. $\frac{2}{5}$ | 13. $\frac{1}{2}$ |
| 4. $\frac{2}{3}$ | 9. $\frac{1}{7}$ | 14. $\frac{6}{6}$ |
| 5. $\frac{3}{5}$ | 10. $\frac{2}{7}$ | 15. $\frac{5}{8}$ |

$\frac{2}{18}$	$\frac{5}{12}$	$\frac{2}{3}$	$\frac{6}{8}$	$\frac{2}{10}$
$\frac{3}{24}$	$\frac{2}{6}$	$\frac{4}{18}$	$\frac{5}{6}$	$\frac{2}{12}$
$\frac{6}{10}$	$\frac{9}{7}$	$\frac{2}{14}$	$\frac{3}{9}$	$\frac{3}{12}$
$\frac{9}{10}$	$\frac{3}{5}$	$\frac{8}{17}$	$\frac{3}{4}$	$\frac{3}{6}$
$\frac{10}{16}$	$\frac{4}{6}$	$\frac{4}{10}$	$\frac{4}{14}$	1

Direct Instruction

NOTE: Show your students these examples on the board as you discuss them.

Teacher says: If a fraction has a numerator that is equal to or larger than the denominator, you have an improper fraction. (For example: $6/6$ or $6/4$) I am going to show you how to convert an improper fraction into whole number or a mixed number.

$6/6$ is an improper fraction. To convert $6/6$ you take the denominator (6) and divide it into the numerator (6). ($6 \div 6 = 1$) The improper fraction $6/6$ is converted to 1. 1 is a whole number.

$6/4$ is an improper fraction. To convert $6/4$ you take the denominator (4) and divide it into the numerator (6). ($6 \div 4 = 1$ with a remainder 2)

$$\begin{array}{r} 1 \text{ R } 2 \\ 4 \overline{)6} \\ - \underline{4} \\ 2 \end{array}$$

Now you have to do one more step if you have a remainder. Take the remainder (2) and make it your new numerator and keep 4 as your denominator. You should have a new fraction $2/4$. Now you put your whole number (1) and your fraction ($2/4$) together ($1 \frac{2}{4}$), which is a mixed number.

Remember:

Fraction- a number that is not a whole number, such as $1/2$

Numerator- the part of a common fraction appearing above the line, representing the number of parts of the whole that are being considered

Denominator- the number below the line in a fraction, which indicates the number of parts making up the whole

Improper fraction- a fraction in which the numerator is equal to or greater than the denominator, such as $6/4$

Whole number- a positive or negative number, including zero that does not contain a fraction or decimal

Mixed number- a figure that consists of a whole number and a fraction, such as the figure $2 \frac{3}{4}$

Student Practice

Name _____ Date _____

Ghoulish Definitions

Directions: To find the meaning of each of the ghoulish definitions listed below, first change each fraction to a mixed numeral. Second, find your answer in the secret code. Third, each time your answer appears in the secret code, write the letter of the problem above it.

1. $7/3 =$ _____ O

6. $13/11$ _____ G

2. $12/4 =$ _____ L

7. $15/10$ _____ U

3. $8/6 =$ _____ B

8. $39/15 =$ _____ H

4. $15/12 =$ _____ D

9. $40/15 =$ _____ A

5. $22/10 =$ _____ N

A VAMPIRE'S DOG: $\frac{\quad}{2\ 10/15}$ $\frac{\quad}{1\ 2/6}$ $\frac{\quad}{3}$ $\frac{\quad}{2\ 1/3}$ $\frac{\quad}{2\ 1/3}$ $\frac{\quad}{1\ 3/12}$ $\frac{\quad}{2\ 9/15}$ $\frac{\quad}{2\ 1/3}$ $\frac{\quad}{1\ 5/10}$

$\frac{\quad}{2\ 2/10}$ $\frac{\quad}{1\ 3/12}$

A WITCH'S PURSE: $\frac{\quad}{2\ 10/15}$ $\frac{\quad}{2\ 9/15}$ $\frac{\quad}{2\ 10/15}$ $\frac{\quad}{1\ 2/11}$ $\frac{\quad}{1\ 2/6}$ $\frac{\quad}{2\ 10/15}$ $\frac{\quad}{1\ 2/11}$

Student Practice

Bonus

Name _____ Date _____

To convert a mixed number to an improper fraction you do this: $3 \frac{2}{3}$

Take the denominator (3) and multiply it by the whole number (3). $3 \times 3 = 9$

Take the product (9) and add it to the numerator (2). $2 + 9 = 11$

Use the sum (11) and use it as your new numerator.

Use the original denominator (3)

Your improper fraction is $\frac{11}{3}$.

Phobias! Phobias! Phobias!

Directions: To find the meaning of each of the phobias listed below, first change each mixed numeral to an improper fraction. Second, find your answer in the secret code. Third, each time your answer appears in the secret code, write the letter of the problem above it.

1. $3 \frac{2}{3} =$ _____ R

8. $3 \frac{1}{3} =$ _____ E

2. $6 \frac{1}{4} =$ _____ H

9. $4 \frac{2}{5} =$ _____ U

3. $2 \frac{1}{3} =$ _____ B

10. $8 \frac{1}{2} =$ _____ T

4. $6 \frac{1}{7} =$ _____ N

11. $10 \frac{1}{3} =$ _____ O

5. $1 \frac{1}{4} =$ _____ G

12. $6 \frac{2}{7} =$ _____ F

6. $2 \frac{1}{2} =$ _____ M

13. $8 \frac{3}{7} =$ _____ S

7. $3 \frac{3}{10} =$ _____ I

14. $1 \frac{1}{9} =$ _____ A

ACROPHOBIA: $\frac{\quad}{44/7}$ $\frac{\quad}{10/3}$ $\frac{\quad}{10/9}$ $\frac{\quad}{11/3}$ $\frac{\quad}{31/3}$ $\frac{\quad}{44/7}$

$\frac{25}{4}$ $\frac{10}{3}$ $\frac{33}{10}$ $\frac{5}{4}$ $\frac{25}{4}$ $\frac{17}{2}$ $\frac{59}{7}$

TRISKAIDEKAPHOBIA: $\frac{\quad}{44/7}$ $\frac{\quad}{10/3}$ $\frac{\quad}{10/9}$ $\frac{\quad}{11/3}$ $\frac{\quad}{31/3}$ $\frac{\quad}{44/7}$

$\frac{17}{2}$ $\frac{25}{4}$ $\frac{10}{3}$ $\frac{43}{7}$ $\frac{22}{5}$ $\frac{5}{2}$ $\frac{7}{3}$ $\frac{10}{3}$ $\frac{11}{3}$

$\frac{17}{2}$ $\frac{25}{4}$ $\frac{33}{10}$ $\frac{11}{3}$ $\frac{17}{2}$ $\frac{10}{3}$ $\frac{10}{3}$ $\frac{43}{7}$

Closing

Discuss how students used their fraction tool kit to help them complete the games and the student practices. Let student volunteers show strategies they learned while playing the games or completing the student practice. Letting students teach other students is one of the most valuable instructional tools. It takes time but it pays off in the retention for your students. They can retain up to 95% of the information they teach as compared to 10-20% of the information they hear.

On www.multiplication.com you can purchase the book *Memorize in Minutes: The Times Tables* and access other great on-line games, activities, worksheets, and etc. for multiplication.

Use www.aplusmath.com to make practice sheets.

A great visual resource for teaching division and multiplication facts to students that are having a difficult time memorizing them is: *Times: Times Tables the Fun Way Division Cards* and *Times Tables the Fun Way, A Picture Method of Learning the Multiplication Facts* by Judy Liautaud www.citycreek.com

Suggested Activities from the *Teacher's Guide to the Alaska Benchmark Examination Grade 6*

- Use fraction bars and pattern blocks to model equivalent fractions.
- Use a ruler to convert between equivalent fractions and between fractions and mixed numbers.
- Find equivalent fractions using the identity property (see standard A1.2.7).

Answers:

A Bloodhound

A Hagbag

Fear of Heights

Fear of the Number Thirteen