

## Lesson 13: Compute Equivalent Fractions

### Lesson Objective

- Students will identify and generate equivalent fractions, using multiplication or division.

### Instructional Materials

Material	Quantity	Description
How Am I Doing? graph	1 per student	
Colored pencils	2 per student	
Heavyweight paper to print cue cards on	1 per student	
Display Masters	1 each	<ul style="list-style-type: none"> <li>Preview: Key Ideas: Compute Equivalent Fractions</li> <li>Demonstrate: Equivalent Fractions</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> A</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> B</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> C</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> D</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> E</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> F</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{3}{24}</math> G</li> <li>Demonstrate: Equivalent Fraction to <math>\frac{20}{15}</math></li> </ul>
Master	1 each	Fraction Go Fish (Note: The cards to play Fraction Go Fish can be cut from this master.)
Handouts	1 each per student	<ul style="list-style-type: none"> <li>Cumulative Review</li> <li>Cue Cards</li> <li>Fraction Go Fish Directions (1 per group of students)</li> <li>Independent Practice</li> </ul>
Answer Keys	1 each	<ul style="list-style-type: none"> <li>Cumulative Review</li> <li>Cue Cards</li> <li>Independent Practice</li> </ul>

## Cumulative Review

Have students answer the questions on the Cumulative Review handout. Go over the answers. Correct misconceptions. Have students use a colored pencil to make corrections as needed. Collect student papers to determine who needs additional instruction.

## Preview

This lesson will provide students with additional practice in generating equivalent fractions. Students will choose whether to multiply or divide and by what factor. Students will apply the conceptual knowledge taught in this lesson when they write and identify fractions in their simplest form and when they add and subtract fractions.

Display and introduce through a brief explanation the key idea for this lesson:

- Creating equivalent fractions by multiplying or dividing requires that the same operation be performed on the numerator and the denominator.
- Equivalent fractions name the same number.

Use the Key Ideas: Compute Equivalent Fractions  display master as needed.

## Engage Prior/Informal Knowledge

To open the lesson, present questions to activate students' background knowledge related to the content to be taught in this lesson. Ask students questions such as:

- What is an equivalent fraction for  $\frac{6}{12}$ ? ( $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \dots$ )
- What is an equivalent fraction for  $\frac{5}{4}$ ? ( $\frac{10}{8}, \frac{15}{12}, \frac{20}{16}, \dots$ )


If students cannot answer these questions, stop and explicitly teach the material. If needed, review several examples of multiplying and dividing to generate equivalent fractions.

## Demonstrate

1. Provide several worked examples such as those shown below to demonstrate how to choose whether to use multiplication or division.

Use the Equivalent Fractions  display master as needed when demonstrating each example. Be sure to say, "I am multiplying/dividing because..." 


**Say:** Let's generate a fraction that is equivalent to  $\frac{3}{24}$  with a denominator of 8. "Equivalent" can also be said as "is the same as" or "is equal to."

Display  $\frac{3}{24} = \frac{\dots}{8}$ . Use the Equivalent Fraction to  $\frac{3}{24}$  A  display master as needed.


**Say:** 8 is below the fraction bar because it is the denominator. I need to find a number to change 24 into 8.

Display:  $24 \underline{\hspace{1cm}} = 8$ . Use the Equivalent Fraction to  $\frac{3}{24}$  B  display master as needed.

**Say:** 8 is a smaller than 24, so I know I need to divide 24 by some number.

Display  $24 \div \underline{\hspace{1cm}} = 8$ . Use the Equivalent Fraction to  $\frac{3}{24}$  C  display master as needed.

**Say:** 24 divided by what number equals 8? 24 divided by 3 equals 8.

Display  $24 \div 3 = 8$ . Use the Equivalent Fraction to  $\frac{3}{24}$  D  display master as needed.



### TEACHER NOTE


It may be helpful to write the number you are multiplying or dividing the numerator and denominator by in a different color.

Display  $\frac{3 \div}{24 \div} = \frac{3}{8}$ . Use the Equivalent Fraction to  $\frac{3}{24}$  E  display master as needed.


**Say:** Remember the rule to find equivalent fractions: multiply or divide both the numerator and denominator by the same number. I need to divide both the numerator and denominator by the same number, 3.

Display  $\frac{3 \div 3}{24 \div 3} = \frac{3}{8}$ . Use the Equivalent Fraction to  $\frac{3}{24}$  F  display master as needed.

**Say:** 3 divided by 3 is 1.

Display  $\frac{3 \div 3}{24 \div 3} = \frac{1}{8}$  and  $\frac{3}{24} = \frac{1}{8}$ . Use the Equivalent Fraction to  $\frac{3}{24}$  G  display master as needed.

**Say:**  $\frac{3}{24}$  and  $\frac{1}{8}$  are equivalent fractions. They have the same value and location on the number line.

Repeat with several examples, including at least one with multiplication, such as generating a fraction that is the same as  $\frac{20}{15}$  with a denominator of 30. Use the Equivalent Fraction to  $\frac{20}{15}$   display master as needed.

## Practice

For each practice activity, provide detailed feedback to students, highlighting what was done correctly and what needs improvement. Provide opportunities for students to correct their errors. Collect student work to review and monitor student progress.



**WATCH FOR** Some students perform an operation only on the numerator. For example:  $\frac{2}{3} \times 2 = \frac{4}{3}$ . Students may assume that multiplying a fraction by 2 and multiplying a fraction by  $\frac{2}{2}$  are the same process.

Teach students that performing an operation only on the numerator is not the same as multiplying by 1 (applying the multiplicative identity property) and changes the fraction's value.

**Activity 1:** Have students work in pairs or groups to complete the problems on the Cue Cards handout. Have students verbalize their reasoning and each step in the process to their partners. Listen for the development of any misconceptions within the reasoning. For students who would benefit from worked out examples, cut the cards for students to keep.

**Activity 2:** Have students play Fraction Go Fish.

Distribute one set of fraction cards and Fraction Go Fish directions to each group.

It may be helpful to have students generate, showing their work, equivalent fractions for each card they draw. Alternatively, it may be helpful to have students show or describe how they know a pair of cards has equivalent fractions.

## Independent Practice

1. Have students work independently to complete the activity on the Independent Practice handout.
2. Go over the answers (students self-check and correct, using a colored pencil).
3. Have students record the number correct in the box and complete their How Am I Doing? graph.
4. Collect the papers to review and monitor student progress.

## Closure

Review the key ideas. Have students provide examples from the lesson. Ask questions such as:

- How do you know if one fraction is equivalent to another fraction?
- How do you know whether to use multiplication or division when creating an equivalent fraction?

Clear up any misconceptions. Students who believe that performing any operation on a fraction changes its value and students who perform an operation only on the numerator or denominator need additional instruction.