MSTAR INTERVENTION

L11

Lesson 11: Models of Equivalent Fractions by Combining Parts

Lesson Objectives

- Students will identify equivalent fractions.
- Students will create equivalent fractions.

Instructional Materials

Material	Quantity	Description
Colored pencils	1 per student	
How Am I Doing? graph	1 per student	
Display Masters	1 each	• Preview: Key Ideas: Models of Equivalent Fractions by Combining Parts • Demonstrate: Area Model: $\frac{8}{12}$ • Demonstrate: Area Model: $\frac{2}{3}$ • Demonstrate: Area Model: $\frac{6}{9}$ • Demonstrate: Area Model: $\frac{4}{6}$ • Demonstrate: Number Lines
Master *Fraction Memory can be created by cutting the Fraction Memory master.*	1 each	• Fraction Memory
Handouts	1 per student	• Cumulative Review • Independent Practice
Answer Keys	1 each	• Cumulative Review • Independent Practice

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 build on students' conceptual knowledge of equivalent fractions. Students will conceptualize equivalent fractions by identifying the effects of changing the size and number of total parts. Students will use the knowledge taught in this lesson when identifying and computing equivalent fractions.

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

- Equivalent fractions name the same number.
- Equivalent fractions can be represented by many different models.

Use the Key Ideas: Models of Equivalent Fractions by Combining Parts DM display master as needed.

Engage Prior/Informal Knowledge

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

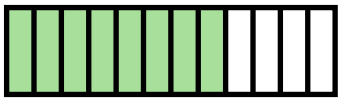
- When we talk about fractions, what does *equivalent* mean?
- What is a fraction equivalent to $\frac{2}{3}$? ($\frac{4}{6}$, $\frac{6}{9}$,…)
- What is a fraction with a denominator of 8 equivalent to $\frac{1}{4}$? ($\frac{2}{8}$)

If students cannot answer these questions, stop and explicitly teach the material.

Demonstrate

1. Create an equivalent fraction by combining parts of an area model.

Display an area model of $\frac{8}{12}$ as shown below. Use the Area Model: $\frac{8}{12}$ **DM** display master as needed.



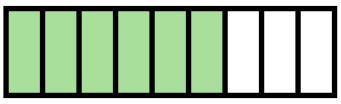
Say: *What fraction is shown here? ($\frac{8}{12}$) I want to show that $\frac{8}{12}$ is equivalent to $\frac{2}{3}$. How would I do that?*

Listen for students to say, "Combine 4 smaller parts to make larger parts." As needed, give hints such as, "Remove division lines to make bigger parts."

Display an area model of $\frac{2}{3}$ as shown below. Use the Area Mode:$\frac{2}{3}$ **DM** display master as needed.

Say: *What happened to the numerator and denominator of $\frac{8}{12}$ when we combined 4 of the smaller parts to make larger parts? I noticed that the numerator and denominator were both divided by 4.*

Display an area model of $\frac{6}{9}$ as shown below. Use the Area Model:$\frac{6}{9}$ **DM** display master as needed.



TEACHER NOTE

It is important to draw attention to the mathematics of what happens to the fraction as the parts of the model are combined. Say things such as: I notice that when I combine 2 parts into 1 part that the numerator and denominator of the fraction divided by 2.

Say: *What fraction is shown here? ($\frac{6}{9}$) I want to show that $\frac{6}{9}$ is equivalent to $\frac{2}{3}$. How would I do that?*

Listen for students to say, "Combine 3 smaller parts to make larger parts." As needed, give hints such as, "Remove division lines to make bigger parts."

Display an area model of $\frac{2}{3}$ as shown below. Use the Area Model: $\frac{2}{3}$ **DM** display master as needed.

Say: *What happened to the numerator and denominator of $\frac{6}{9}$ when we combined 3 of the smaller parts to make larger parts? I noticed that the numerator and denominator were divided by 3.*

Display a fraction bar showing $\frac{4}{6}$ as shown below. Use the Area Model: $\frac{4}{6}$ **DM** display master as needed.

Say: *What fraction is shown here? ($\frac{4}{6}$) I want to show that $\frac{4}{6}$ is equivalent to $\frac{2}{3}$. How would I do that?*

Listen for students to say, "Combine 2 smaller parts to make larger parts." As needed, give hints such as, "Remove division lines to make bigger parts."

Display an area model of $\frac{2}{3}$ as shown below. Use the Area Model: $\frac{2}{3}$ **DM** display master as needed.

Say: *What happened to the numerator and denominator of $\frac{4}{6}$ when we combined 2 of the smaller parts to make larger parts? I noticed that*

the numerator and denominator were divided by 2.

2. Create models of equivalent fractions represented on number lines.

Use the Number Lines DM display master to repeat the process outlined in step 1 using a number line model.

For example:

Display a number line representing $\frac{8}{12}$ as shown below.

Say: *What fraction is shown here? ($\frac{8}{12}$) I want to show that $\frac{8}{12}$ is equivalent to $\frac{2}{3}$. How would I do that?*

Listen for students to say, "Combine 4 smaller parts to make larger parts." As needed, give hints such as, "Remove division lines to make bigger parts."

Display a number line of $\frac{2}{3}$ as shown below.

Say: *What happened to the numerator and denominator of $\frac{8}{12}$ when we combined 4 of the smaller parts to make larger parts? I noticed that the numerator and denominator were both divided by 4.*

3. Repeat with several equivalent fraction pairs such as $\frac{4}{10}$ and $\frac{2}{5}$.

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.

Activity 1: Repeat the process with additional fractions using area models and number lines until students can show and explain how combining smaller parts into larger ones makes equivalent fractions, which can be found by dividing both the numerator and denominator by the same number.

Activity 2: Have students play the game Memory to practice identifying equivalent fractions. Use the cards found on the Fraction Memory master. Have students verbalize their reasoning and each step in the process to their partners. Listen for the development of any misconceptions within the reasoning.

It may be helpful for students to draw the pairs of equivalent fractions they find.

As students play, circulate, asking questions such as:

- How do you know the fractions are equal?
- What would be another fraction equal to (the fraction a student has matched)?

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:

- What does combining smaller parts into larger ones do to the numerator and denominator of a fraction?
- Is an equivalent fraction bigger, smaller, or the same size as the original fraction?

Clear up any misconceptions. Students who struggle with the idea that combining parts to make larger parts creates a new fraction with a smaller numerator and denominator need additional instruction.