MSTAR INTERVENTION

L9

Lesson 9: Models of Equivalent Fractions by Subdividing 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	
Fraction Memory	1 set per group of 4 students	*Cards to play Fraction Memory can be made from the Fraction Memory master.*
Display Masters	1 each	• Preview: Key Ideas: Models of Equivalent Fractions by Subdividing Parts • Demonstrate: Rectangles A • Demonstrate: Rectangles B • Demonstrate: Rectangles C • Demonstrate: Rectangles D • Demonstrate: Rectangles E • Demonstrate: Number Line A • Demonstrate: Number Line B • Demonstrate: Number Line C • Demonstrate: Number Line D • Demonstrate: Number Line E
Master	1 each	• Fraction Memory
Handouts	1 per student	• Cumulative Review • Practice • 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 as well as when comparing and ordering 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 Subdividing Parts **DM** 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 a fraction equivalent to $\frac{1}{2}$? ($\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{5}{10}$, etc.)
- What is a fraction with a denominator of 8 that is equivalent to $\frac{3}{4}$? ($\frac{6}{8}$)

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

Demonstrate

1. Discuss the concept of a whole.

Display the Rectangles A **DM** display master.

2. Represent $\frac{2}{3}$ and generate its equivalent fraction $\frac{4}{6}$ on the rectangle model of 1 whole.

Say: *I want to show $\frac{2}{3}$ on the picture. How would I do that?*

Listen for students to say divide the rectangle into 3 parts and shade 2 of those parts.

Divide and shade the rectangle to show $\frac{2}{3}$. Use the Rectangles B **DM** display master as needed.

Say: *I want to show a fraction equivalent to $\frac{2}{3}$ with a denominator of 6. What should I do? I should subdivide each section into 2 parts.*

Subdivide each section into 2 parts. Use the Rectangles C **DM** display master as needed.

Say: *By looking at the rectangle now what is another name for $\frac{2}{3}$? ($\frac{4}{6}$) Are $\frac{2}{3}$ and $\frac{4}{6}$ equivalent fractions? (yes) How do you know? ($\frac{4}{6}$ covers the same area as $\frac{2}{3}$.)*

TEACHER NOTE

It is important to draw attention to the mathematics of what happens to the fraction as the parts of the model are subdivided. Say things such as: I notice that when I subdivide the parts into 2 parts that the numerator and denominator of the fraction were multiplied by 2.

Say: *What happened to the numerator and denominator of $\frac{2}{3}$ when we subdivided the parts into 2 pieces? (The numerator and denominator were both multiplied by 2.)*

Help students see that both the numerator and denominator were multiplied by 2.

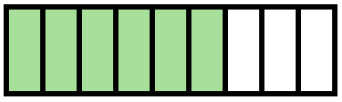
3. Represent $\frac{2}{3}$ and generate and its equivalent fraction $\frac{6}{9}$ on the area model of 1 whole.

Display another copy of Rectangles A DM display master. Remind students that the rectangle represents 1 whole.

Divide the rectangle into 3 parts and shade 2 parts. Use the Rectangles B DM display master as needed.

Say: *What fraction did I just make? I want to show a fraction with a denominator of 9 that is equivalent to $\frac{2}{3}$. What should I do? I should subdivide each part into 3 parts.*

Subdivide each part into 3 parts. Use the Rectangles D DM display master as needed.



Say: *What fraction with a denominator of 9 is equivalent to $\frac{2}{3}$? ($\frac{6}{9}$)*

Say: *What happened to the numerator and denominator of $\frac{2}{3}$ when we subdivided the parts into 3 pieces? (The numerator and denominator were both multiplied by 3.)*

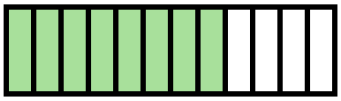
4. Represent $\frac{2}{3}$ and generate its equivalent fraction $\frac{8}{12}$ on the rectangle model of 1 whole.

Display the Rectangles A DM display master. Remind students that the rectangle represents 1 whole.

Divide the rectangle into 3 parts and shade 2 parts. Use the Rectangles B DM display master as needed.

Say: *I want to show a fraction with a denominator of 12 that is equivalent to* $\frac{2}{3}$ *. What should I do? (subdivide each part into 4 parts)*

Subdivide each part into 4 parts. Use the Rectangles E DM display master as needed.



Say: *What fraction with the denominator of 12 is equivalent to* $\frac{2}{3}$ *?* ($\frac{8}{12}$)

Say: *What happened to the numerator and denominator of* $\frac{2}{3}$ *when we subdivided the parts into 4 pieces? (Both the numerator and denominator were multiplied by 4.)*

5. Repeat steps 2–5 using a number line model. Use the Number Line A-E DM display masters 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.

Activity 1: Use the Practice handout to help students create equivalent fractions using circles. Use fractions with denominators of 2, 4, or 8, which are easy to draw using circles.

Activity 2: Have students play the game Memory to practice identifying equivalent fractions. Use the cards found on the Fraction Memory master. It may be helpful for students to draw the pairs of equivalent fractions they find. Have students verbalize their reasoning and each step in the process to their partners. Listen for the development of any misconceptions within the reasoning. 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 subdividing larger parts do to the numerator and denominator of a fraction?
- Where is an equivalent fraction located on the number line in relation to the original fraction?

Clear up any misconceptions. Students who do not understand that subdividing into smaller parts makes a fraction with a larger numerator and denominator need additional instruction.