MSTAR INTERVENTION

L7

Lesson 7: Model Equivalent Ratios

Lesson Objective

- Students will model equivalent ratios.

Instructional Materials

Material	Quantity	Description
Colored pencils	1 per student	
How Am I Doing? graph	1 per student	
Display Masters	1 each	• Preview: Key Idea: Model Equivalent Ratios • Demonstrate: Apples • Demonstrate: Large Apples to Small Apples A • Demonstrate: Large Apples to Small Apples B • Demonstrate: Large Apples to Small Apples C • Demonstrate: Large Apples to Small Apples D • Demonstrate: Large Apples to Small Apples E
Handouts	1 per student	• Cumulative Review • Large Apples to Small Apples • Practice 1 • Practice 2 • Independent Practice
Answer Keys	1 each	• Cumulative Review • Practice 1 • Practice 2 • Independent Practice

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Cumulative Review

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

Preview

This lesson will build on students' prior knowledge of ratios. Equivalent ratios will be introduced by modeling that 2 ratios can be simplified to the same ratio.

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

- Equivalent ratios describe the same relationship between objects, which means they can be simplified to the same ratio.

Use the Key Idea: Model Equivalent Ratios DM display master as needed.

Engage Prior/Informal Knowledge

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

- Find an equivalent fraction for each of the following: $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{5}{8}$ (e.g., $\frac{2}{4}$, $\frac{4}{6}$, $\frac{6}{8}$, $\frac{10}{16}$)
- 10 of the 25 students in a class are boys. What is the ratio of boys to total students? ($\frac{10}{25}$ or $\frac{2}{5}$)
- Is this ratio comparing a part to a part or a part to a whole? (part to a whole)
- A small pizza has 6 total slices—2 slices have pepperoni and 4 slices have sausage. What is the ratio of pepperoni slices to sausage slices? ($\frac{2}{4}$ or $\frac{1}{2}$)
- Is this ratio comparing a part to a part or a part to a whole? (part to a part)

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

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Demonstrate

1. Model an equivalent ratio.

Use the Apples DM display master and the Large Apples to Small Apples A DM display master as needed. Distribute the Large Apples to Small Apples handout. Have students complete their handout throughout the discussion.

Say: *First, what 2 things are we comparing? (large apples to small apples)*

Say: *What is the ratio of large apples to small apples? (3 to 4)*

Say: *The ratio of large apples to small apples is 3 to 4. Now, imagine that we have 8 small apples. How many large apples would we need for the ratio of large to small apples to still be 3 to 4? Let's find out.*

Use the Large Apples to Small Apples B DM display master as needed.

Say: *I will draw a picture to model the 3 large apples to 4 small apples ratio. Next to the 4 small apples, I am going to draw 8 more small apples.*

Use the Large Apples to Small Apples C DM display master as needed.

2. Find the missing part of the equivalent ratio.

Say: *To find the missing part of the equivalent ratio—how many large apples—I have to draw enough apples so there are 3 large apples for every 4 small apples. That is how I will know that the 2 ratios are equivalent: The relationship between large apples and small apples will stay the same.*

Say: *For every 4 small apples, I need 3 large apples. For the first 4 small apples, how many large apples should I draw? (3) How many large apples should I draw for the second group of 4 small apples? (3) How many large apples do I have in all? (6)*

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Say: *I will now show that the ratio 3 to 4 is equivalent to the ratio 6 to 8. I can circle groups of 3 large apples for every 4 small apples without any left over.*

Use the Large Apples to Small Apples D DM display master as needed.

Say: *This means that the apples in the box on the right still have a ratio of 3 large apples to 4 small apples. Another way to say this is there are 3 large apples for every 4 small apples.*

Say: *The ratio 3 large apples to 4 small apples is equivalent to the ratio 6 large apples to 8 small apples.*

3. Confirm that $\frac{3}{4}$ is equivalent to $\frac{6}{8}$.

Say: *A way to check that 2 ratios are equivalent is to simplify them. If both ratios simplify to the same ratio, they are equivalent.*

Say: *Can $\frac{3}{4}$ be simplified? (no) Can $\frac{6}{8}$ be simplified? (Yes, it simplifies to $\frac{3}{4}$.)*

Use the Large Apples to Small Apples E DM display master as needed.

Say: *Because both ratios simplify to $\frac{3}{4}$, the ratios are equivalent.*

Practice

WATCH FOR
Some students think the order of the quantities is not important in equivalent ratios. Teach students to match up the units of the ratios either vertically or horizontally.

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.

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Activity 1: Help students to complete the activity on the Practice 1 handout. Select a few students to verbalize their reasoning and each step in the process.

Activity 2: Have students work in pairs to complete the activity on the Practice 2 handout. Have students verbalize their reasoning and each step in the process to their partners.

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 student progress.

Closure

Review the key idea. Have students provide examples from the lesson.

Have students discuss their answers to the following questions:

- What steps would you use to figure out whether 2 ratios are equivalent? (simplify both ratios)
- What does it mean for 2 ratios to be equivalent? (both ratios simplify to the same ratio)

Clear up any misconceptions. Students who think the order of the quantities is not important in equivalent ratios need additional instruction.

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