MSTAR INTERVENTION

L2

Lesson 2: Generate Ratios

Lesson Objective

- Students will generate ratios, using illustrations.

Instructional Materials

Material	Quantity	Description
Apples (optional)	• 3 large • 4 small	
Assorted linking cubes or centimeter cubes	1 bag per student	20-plus in small plastic bag
Paper	1 sheet per student	
Blue, red, yellow, and green colored pencils, markers, or crayons	1 of each color per student (optional)	
How Am I Doing? graph	1 per student	
Display Masters	1 each	• Preview: Key Idea: Generate Ratios • Engage Prior/Informal Knowledge: Apples (optional) • Demonstrate: Linking Cubes (optional) • Demonstrate: 3 Blue to 5 Yellow A • Demonstrate: 3 Blue to 5 Yellow B
Handouts	1 each per student	• Cumulative Review • Practice • Independent Practice
Answer Keys	1 each	• Cumulative Review • Practice • Independent Practice

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 conceptual knowledge of ratios. Students will generate real-life ratios, using illustrations.

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

- Ratios can be generated to represent situations in real life.

Use the Key Idea: Generate 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:

- What did we learn about ratios? (Ratios compare a part to a part or a part to a whole.)
- How are ratios different from fractions? (Fractions always compare a part to a whole.)

Display the 3 large and 4 small apples. Use the Apples DM display master as needed.

- What is the ratio of large to small apples? ($\frac{3}{4}$)
- What is the ratio of large to all apples? ($\frac{3}{7}$)
- What is the ratio of small to all apples? ($\frac{4}{7}$)
- What is the ratio of small to large apples? ($\frac{4}{3}$)
- What are the 3 ways we can write the ratio of small to large apples? (4 to 3, 4:3, $\frac{4}{3}$)

Demonstrate

1. Generate ratios to compare parts of a model.

Display 3 blue, 5 yellow, and 2 red linking cubes joined to make a rod. Use the Linking Cubes DM display master as needed.

Say: *How can I compare different parts of this set of cubes? (blue:yellow, blue:red, red:yellow, blue:all, yellow:all, red:all, etc.)*

2. Draw pictures to model a situation.

Say: *Now we will draw pictures of different ratios.*

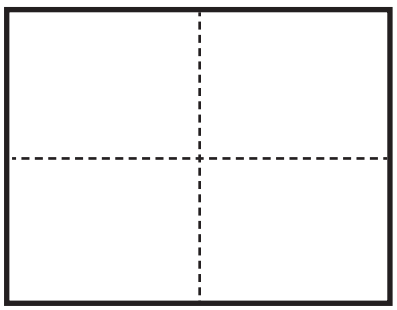
Write and display "3 blue to 5 yellow." Use the 3 Blue to 5 Yellow A DM display master as needed.

Say: *I will draw a picture to represent 3 blue cubes to 5 yellow cubes.*

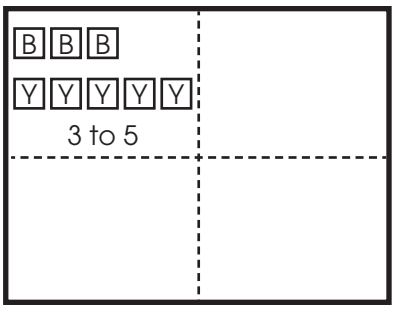
Draw and display a picture. Use the 3 Blue to 5 Yellow B DM display master as needed.

Distribute a sheet of paper to each student.

Have students fold the paper in half horizontally and vertically, forming 4 rectangles, as shown below.



Have students draw 3 blue squares and 5 yellow squares in 1 of the rectangles.



Say: *What is the ratio of blue to yellow squares? Write that ratio in the same rectangle. (3 to 5)* 1

TEACHER NOTE
If students do not have colored pencils, have them write "B" on 3 of the squares to represent blue and "Y" on 5 of the squares to represent yellow.

3. Identify a part-to-whole ratio.

Say: *Draw a picture showing 5 yellow squares to 8 total squares, assuming the remaining squares are blue. Does your picture look different? (no)*

Say: *Using this picture, identify another part-to-whole ratio.*

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: Help students generate ratios and draw an illustration to model the situation, using their folded paper.

Distribute sets of linking cubes to each student.

Say: *Can you find a ratio comparing 2 of the colors of your cubes? What is that ratio? (answers vary)*

Say: *Now, choose red and green from your bag of cubes and draw a picture in 1 of the other rectangles on your paper*

to represent that ratio. Write the ratio for your picture.

Say: *Repeat this process 2 more times, choosing 2 colors each time. You will have an illustration and text in each rectangle of your paper when you are finished. Ask a partner to check your work.*

As students work, circulate and ask questions, such as the following:

- How did you know that the ratio of the cubes you chose was ___ to ___?
- What would happen if I decided to compare the blue to the red instead of the red to the blue?

Activity 2: Have students work in pairs to complete the activity on the Practice 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 picture would you draw to represent 4 girls and 5 boys at a lunch table?
- What is another way you could represent the ratio of girls to boys at the table?

(4 to 5, 4:5, or $\frac{4}{5}$)

Clear up any misconceptions. Students who struggle to generate a ratio for a given situation need additional instruction.