

ELEMENTARY MATH PROJECT
Grade 6
Key Number Concept 3: Ratios and Percents
Sample Week at a Glance

Prior to this week of lessons, students practiced operations with fractions and spent time exploring equivalent fractions

Fill in each day using a 3-Part Lesson model and a variety of lesson structures.
Embed computational fluency in different colour or icon

Monday	<p>Introduction to Ratios</p> <p>Key Math Terms:</p> <ul style="list-style-type: none"> ● Ratio ● Set ● Term ● Part-to-part ratio ● Part-to-whole ratio <p>Pair Investigation: In groups of two, come up with all the ways you can think of that the items in the image can be compared. Share your thinking with your learning partner and draw each comparison.</p> <p>Share your thoughts with another pair of students. What was the same? What was new?</p> <p>Teacher led class discussion: what are the different ways that the items in the picture were compared?</p> <p>Explain that the term ratio can be used to describe a comparison of two quantities of the same type (item, unit, animal, etc.).</p> <p>All the items in the picture can be referred to as a set.</p> <p>Show that some groups decided to separate the items in the set and compare them to each other; Part-To-Part Ratio</p> <p>Some groups decided to look at one specific item in the set and compare it to all the items in the set: Part-To-Whole</p> <p>We can represent ratios in different ways: as a fraction (part-to-whole), in</p>
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	<p>words, or by using symbols (numbers and a colon)</p> <p>Invite students to revisit their recordings from the introductory investigation and to record the ratios they represented in drawings in one or two other ways.</p> <p>Closing Circle: where in real-life might we see the use of ratios? Why might they be useful?</p>
<p>Tuesday</p>	<p>Playing with Ratios</p> <p>Math Talk</p> <div data-bbox="402 611 662 800" data-label="Image"> </div> <p>Source: Amy Hoelscher</p> <p>Invite students to share their process for determining a solution and to ensure they include the key terms in their explanation. Students are invited to compare ratios in this example, without having a formal introduction to equivalent ratios. Take note of the various strategies students share and the connections they make to equivalent fractions. Revisit this example when exploring equivalent fractions more explicitly.</p> <p>Small Group Investigation: What is being compared in each ratio?</p> <div data-bbox="423 1230 626 1478" data-label="Image"> </div> <p>a) 3:4 b) 4/7 c) 3 to 7 d) 4:3</p> <p>Teacher led class discussion: debrief introductory activity assessing for understanding of key concepts and key terms.</p> <p>Using manipulatives to</p>
<p>Wednesday</p>	<p>Introduction to Equivalent Ratios</p> <p>Key Math Term:</p>

- Equivalent Ratios

Pair Investigation: Students use colour hues to model, construct, and communicate equivalent ratios.

Materials: water and food colouring (red and blue). Pre-mix two solutions (one drop of food colouring per cup) for each pair of students.

Procedure: provide students with pre-mixed solutions and ask them to record observations of each and to make predictions about what might happen if the solutions are combined. Students combine the solutions in a 1 (red): 2 (blue) ratio and record observations. They can then play with various recipes to determine how the ratios of the color mixtures impact the hue. The activities here reinforce the idea that scaling a recipe up (or down) requires scaling the amount of each ingredient by the same factor

Students should notice that the colour doesn't change when ratios are increased proportionately (equivalent ratios).

Extension: students can be invited to create certain hues and identify the ratio of the solutions that was necessary to create them.

Closure: What makes ratios equivalents? All ratios that are equivalent can be generated by multiplying both terms of the ratio by the same number.

Exit slip: Explain why the pair of ratios is an equivalent ratio, or draw a diagram that shows why.

4:5 and 8:10

Thursday

Exploring Equivalent Ratios

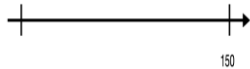
Number Talk Routine: Find the quotients mentally.

$$150 \div 2$$

$$150 \div 4$$

$$150 \div 8$$

Locate and label the quotients on the numberline.



Note: This number talk helps students think about what happens to a quotient when the divisor of a fraction, or a term of a ratio is doubled.

Small Group Investigation:

Provide students with the following problem to determine a solution for.

George is planting a border around his garden. He plants 5 yellow daisies for every 3 red tulips. How many tulips would he plant for each number of daisies.

- a) 10 daisies
- b) 15 daisies
- c) 20 daisies

Invite students to record their thinking and solution and to share their process for determining a solution with the class.

Invite students to share how the concept of equivalent ratios applies to this problem.

While students share their processes and solutions, illustrate the use of a table and patterns to determine the ratios.

Ask students to design a problem that requires the use of equivalent ratios to determine a solution. Provide constraints to the problem (eg. real-life context, numbers to 100, etc.) Students invite another pair in the class to determine a solution to their problem.

Friday

Applying Ratios

Class investigation: What is being compared in this ratio?

Display a set of items and corresponding ratios that might apply to the context.

Example:

The graphic features the title "Applying Ratios" in a large, bold, purple font. Below the title, the text "What is being compared in the ratio **1:2**?" is displayed. To the right, a thought bubble contains the question "Can you think of more than one possibility?". Below these elements is a horizontal row of seven circular icons, each containing a black silhouette of an animal and its name underneath: Crane, Eagle, Owl, Orca, Raven, Salmon, and Wolf.

(Note: image from Surrey School District: [Parent Video Series](#))

Future learning opportunities with ratios may introduce double number lines and how they may be used to identify equivalent ratios. Students may also be invited to explore ratios in recipes and making adjustments in recipes using ratios.

