

# Lesson Title: Paint Splat: Comparing Ratios

## Pre-Planning

### Learning Goals

- Students will be able to create equivalent ratios.
- Students will be able to compare unequal ratios in a real-world context involving concentration levels.

Note: At this stage, any viable strategy for comparing ratios is acceptable. Students will formalize strategies in later lessons.

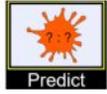
**Standards:** [CCSS.MATH.CONTENT.7.RP.A.1](#) Analyze proportional relationships and use them to solve real world and mathematical problems.

**Curriculum Alignment:** Grade 7 Connected Mathematics 3 Comparing and Scaling Problem 1.2 Mixing Juice

**Prior Knowledge:** Multiples, scaling ratios, using ratio statements to find fraction statements, mathematical ways to compare quantities

**Materials:** Chromebooks or laptops (either one device per student or one device per pair, depending on teacher choice), Activity Sheet, access to [https://phet.colorado.edu/sims/html/proportion-playground/latest/proportion-playground\\_en.html](https://phet.colorado.edu/sims/html/proportion-playground/latest/proportion-playground_en.html)

## Lesson Flow - guided by the [Lesson Slides](#)

<p>Warm-Up: 5 minutes</p>	<p>1) Create at least three fractions that are equivalent to <math>\frac{3}{4}</math></p> <p>2) Alice has \$6 and Bob has \$2. They combine their money to buy a pack of new pencils.  <i>What is the ratio of Alice's money to Bob's money?</i>  <i>What fraction of the total money is Alice's?</i>  <i>What fraction of the total money is Bob's?</i>  <i>Suppose the pack of pencils contains 80 pencils. How many of the pencils should Alice get, and how many of the pencils should Bob get?</i></p> <p>3) Are there any other ways to compare Alice's and Bob's money?</p> <p>Students complete the warm-up in their notebooks. Teacher may have students discuss in pairs or go over answers as a whole group.</p>
<p>Explore the sim:</p> <ul style="list-style-type: none"> <li>• 5 minutes without teacher input</li> <li>• 2 - 3 minutes with teacher questions</li> </ul>	<p>Teacher circulates helping only with technical issues during the first 5 minutes.</p> <p>After 5 minutes, the teacher may choose to ask probing questions such as:</p> <ul style="list-style-type: none"> <li>• What do you notice about the paint splats that are the exact same color?</li> <li>• What can you learn from 2 paint splats that you cannot learn from seeing only one splat?</li> </ul>
<p>Activity Sheet - <b>Questions 1-5 only</b> (20-25 minutes)</p> <p><a href="#">Student Activity Sheet</a></p>	<p>Display the Activity Sheet Instructions slide as students work</p> <p><b>Activity Sheet Instructions:</b></p> <ul style="list-style-type: none"> <li>• Work with a partner.</li> <li>• Part A: Use the Explore part of the sim </li> <li>• Part B: Use the Predict part of the sim </li> <li>• We will come back together as a class after #5.</li> </ul> <p>Questions for Part A:</p> <p>After students finish question #3:</p> <ul style="list-style-type: none"> <li>• What did you notice about the ratios from #2?</li> </ul>

	<ul style="list-style-type: none"> <li>• Tell me how you can create another ratio that matches with those from #2.</li> </ul> <p>Questions for Part B:</p> <p>If students are struggling on #4 to come up with a strategy:</p> <ul style="list-style-type: none"> <li>• Can you draw a picture showing 3 units of black paint and 5 units of white paint?</li> <li>• Would a ratio table help you?</li> <li>• If you double the amount of black and double the amount of white, will the shade of the paint remain the same? (For example, doubling 3 black and 5 white to 6 black and 10 white)</li> </ul> <p>After students have completed #4:</p> <ul style="list-style-type: none"> <li>• Did you use the same strategy for each comparison? Why/why not?</li> <li>• What strategies did you use?</li> </ul>
<p>Discussion/Summary (10 minutes)</p>	<p>The main whole class discussion happens after problem #5 on the activity sheet.</p> <p>First, ask students to share their strategies. (use slide 8)</p> <p>Use the slides to facilitate a discussion of part to part versus part to whole (slides 9 and 10). An understanding of this difference will be essential for students to complete #6-7 on the activity sheet.</p> <p>Possible additional questions about Kathy's strategy (slide 11)</p> <ul style="list-style-type: none"> <li>• How would Kathy describe mixture A, B, or D?</li> </ul>
<p>Activity Sheet #6 and #7 (5 minutes)</p>	<p>Show slide 11 as students complete #6 and #7</p>
<p>Big Ideas Summary (2 minutes)</p>	<p>Slide 12</p> <p>With students, discuss and list successful strategies for comparing mixtures. This is the Big Ideas slide. Some strategies might include: Make part to part RATIOS, make part to whole FRACTIONS, scale the black or white paint up or down to match for the mixtures, place the ratios or fractions on number lines, change to decimals, change to percents, etc.</p>
<p>Exit Ticket</p>	<p>See slide 13.</p>

(5 minutes)

### Exit Ticket

Saline Water Solution A

4 cups of water

1 cup of salt

Saline Water Solution B

7 cups of water

3 cups of salt

Which solution is saltier?

Show work and explain in words to justify your answer.

