**5E Lesson Plan**

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| **Standard Addressed:**  **CC.2.1.6.D.1**  **Understand ratio concepts and use ratio reasoning to solve problems.**  **CC.2.1.7.D.1**  **Analyze proportional relationships and use them to model and solve real-world and mathematical problems.**  **Lesson Name:** Ratios and Proportions | | |
| **Author:** Ryan Mulville | | |
| **Subject area / grade level:** Math / 7th and 8th graders | | |
| **Time:** 75 minutes | | |
| **Materials:**   * Two large buckets of water * One empty bucket or other container * Red and Blue food dye * “Illest Road Trip of All Time” worksheets and materials | | |
| **Lesson objective(s): Students Will Be Able To…**   1. Identify what a proportion is 2. Use proportions to solve out problems of bigger or smaller proportion 3. Convert measurements into different types of measurements using proportions | | |
| **What will the Teacher be Doing** | **Elicit Questions** | **What are the Students Doing** |
| **ENGAGEMENT** | | |
| * Gather students’ attention towards the front where buckets of blue and red water are present. * Ask students what combination of water is needed to make purple. (Usually it is 2 cups of blue, 3 cups of red, but could vary depending on the type/amount of dye used) | * How much of each type of water is needed to make purple water? | * Provide amounts of blue and red water to make purple water. * Change answers upon the teacher mixing in the given amounts. |
| **EXPLORATION** | | |
| * Go through the examples that the students provide, leading to the correct answer. * Ask students how much water would be needed to make 20 cups of purple water? | * How much blue and red water is needed to make 20 cups of purple water? | * Students will work out on paper how much water is needed. * Students can come up and work with the waters to figure out a solution. |
| **EXPLANATION** | | |
| * Have the students explain their reasoning and ask if they know a way they can represent their findings. * Make sure to make it clear that a ratio is used for the first part of the activity and that a proportion is used when figuring out the 20 cup question. * Go through the powerpoint and have students figure out how to solve for a proportion with a variable in the one ratio.   + Have students try to figure out on their own.   + This should lead to the explanation of cross products. * Provide examples and let students explain how to solve for word problems given. | * Is there some mathematical term or visual that can be used to represent the answers you found? | * Students engage in developing their own understanding of ratios, proportions, and how to solve them out if a variable is missing. * Students complete the word problems and share their answers. |
| **ELABORATION** | | |
| * Follow the “Illest Road Trip of All Time” activity. | * How can we use a small map to figure out the actual distance travelled in a road trip across America? | * Completing the activity and using proportions to convert inches on the map to miles to calculate the total distance travelled and the amount of gas needed. |
| **EVALUATION**   * Submission of their “Illest Road Trip of All Time” worksheet, either at the end of class or due the beginning of next class. | | |