**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
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| **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
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| **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.
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| **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.
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| **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.
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| **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.
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| **EVALUATION*** Submission of their “Illest Road Trip of All Time” worksheet, either at the end of class or due the beginning of next class.
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