**Ratio and Proportion**

**Level: B (GLE 5-8, CCRS C/D)   
Anticipated Length of Time: 27 hours (3 hrs/week for 9 weeks)**

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| **Stage 1 – Desired Results** | |
| **Goal/Learner Outcomes:**  **By the end of this unit, students will be able to use an understanding of ratios in order to correctly mix medication.** | |
| **CCR Content Standard(s):**   * Understand ratio concepts and use ratio reasoning to solve problems (6.RP.1, 6.RP.2, 6.RP.3) * Analyze proportional relationships and use them to solve real-world and mathematical problems (7.RP.2) * Gain familiarity with factors and multiples (4.OA.4) | |
| **CCR Standard(s) for Mathematical Practice:**  MP 1 (Make sense and persevere)  MP 2 (Reason abstractly and quantitatively)  MP 4 (Modeling)  MP 8 (Look for and express regularity in repeated reasoning) | |
| **Understanding (s)**  Students will understand… (concepts)   * Ratios involve multiplicative relationships * Where equal ratios are important in the real world * How to tell if two ratios are equal * The difference between part/part and part/whole relationships | **Essential Question(s) (Big ideas)**  What does it mean to have equal ratios? How do I know if they are equal?  How is a ratio a comparison?  How are ratios similar or different from fractions? |
| **Student Knowledge and Skills**  Students will know … (skills)   * How to set up a ratio and proportion * Different ways write ratios using notation and words * How to use pictures, the property of equal ratios, unit cost/rate, or the cross product to tell if two ratios are equal * Solve for a missing quantity in a proportion   Students will be able to … (application)   * Compare two deals * Keep two recipes “correct” while adjusting the quantities involved * Fix a recipe * Choose from several possible ways of expressing a ratio to find the most effective way to make a point   **Other Integrated Math Content**   * Benchmarks: ½, ¼, ¾, 1/10 as fractions, decimals, and percentages * Number sense: Division and multiplication as inverse operations * Number sense: Common multiples * Test Strategies: Using a Process of Elimination * Test Strategies: Drawing a picture | |
| **Stage 2 – Assessment Evidence** | |
| **Performance Task(s):**   * Students will design an advertisement to “make a point” * Students will correctly mix a “medicine” according to instructions and fix an improperly mixed recipe | **Other Evidence:**  Open-notebook Quiz  HiSet-like questions  Informal assessment |
| **Stage 3 – Learning Plan** | |
| **Learning Activities**  *EMPower Keeping Things in Proportion (KP)* Lesson 1 – A Close Look at Supermarket Ads   * Students use supermarket ads to find ratios and determine prices for different quantities * Students look for patterns in the numbers and generalize. Students discuss and solidify methods for determining equal ratios. * Students create ads for buying a product in bulk and compare different bulk deals.   *EMPower (KP)* Lesson 3 – Tasty Ratios   * Students use taste and sight to estimate ratios for 3 orange juice mixtures. * Students use pictures to determine how to fix failed recipes.   Teacher generated   * Student write part/part and part/whole ratios about the class and about posters * Students take notes about different ways to write ratios using notation and words   *EMPower (KP)* Lesson 4 – Another Way to Say It   * Students write part/part and part/whole ratios about the orange juice recipe. * Students analyze two truths and a lie about a complex ratio situation * Students apply different ways of writing comparisons to advertisements and discuss which are most effective. * Students explore the connection between part/whole ratios and fractions and percentages.   Test Strategies (use questions from pg 55-56 in *EMPower KP*)   * Students take notes on using a process of elimination and on questions that use “not” and practice these strategies with test practice problems involving ratios   *EMPower (KP)* Lesson 8 – Playing with the Numbers   * Students look closely at the relationships between the numbers in a proportion (in and among) * Students determine if statements about proportions are true. * Students review the relationship between multiplication and division. * Students use the cross product to solve for a missing number in a proportion.   Teacher generated   * Students mix “medicines” (using water and Kool-Aid) following instructions. * Students fix failed medicine mixtures. | |