**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)
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| **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
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| **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 QuizHiSet-like questionsInformal 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.
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