

Ratio and Proportion

Level: B (GLE 5-8, CCRS C/D)

Anticipated Length of Time: 27 hours (3 hrs/week for 9 weeks)

Stage 1 – Desired Results	
<p>Goal/Learner Outcomes:</p> <p>By the end of this unit, students will be able to <u>use an understanding of ratios in order to correctly mix medication.</u></p>	
<p>CCR Content Standard(s):</p> <ul style="list-style-type: none"> • 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) 	
<p>CCR Standard(s) for Mathematical Practice:</p> <p>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)</p>	
<p>Understanding (s) Students will understand... (concepts)</p> <ul style="list-style-type: none"> • 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 	<p>Essential Question(s) (Big ideas)</p> <p>What does it mean to have equal ratios? How do I know if they are equal?</p> <p>How is a ratio a comparison?</p> <p>How are ratios similar or different from fractions?</p>
<p>Student Knowledge and Skills Students will know ... (skills)</p> <ul style="list-style-type: none"> • 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: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$, $\frac{1}{10}$ 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.