Math 7 Unit 5 Overview: Proportional Reasoning

Unit Outcomes At the end of this unit, your student should be able to:	**Key Vocabulary** Terms to deepen the student's understanding
✓ Find unit rates using ratio tables and graphs ✓ Use tape diagrams and double number line diagrams to create equivalent ratios and solve for missing values ✓ Identify proportional relationships using tables, coordinate plane graphs, unit rates and equations ✓ Apply knowledge about proportions to indirect measurement, similar figures, and scale drawings ✓ Identify the constant of proportionality ✓ Solve proportions using multiple methods ✓ Show knowledge of indirect measurement and scale drawings ✓ Set-up and solve real life problems that can be solved with proportions	✓ Complex Fractions ✓ Congruent ✓ Constant of Proportionality ✓ Corresponding ✓ Dimensions ✓ Equivalent Ratios ✓ Indirect Measurement ✓ Number line diagram ✓ Proportion ✓ Proportional Relationship ✓ Rate ✓ Ratio ✓ Scale ✓ Scale Drawing ✓ Scale Factor ✓ Scale Model ✓ Similar Figures ✓ Tape diagram ✓ Unit Rate
Key Standards Addressed Connections to Common Core/NC Essential Standards	**Where This Unit Fits** Connections to prior and future learning
7.G.1 - Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. 7.RP.1 - Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.* 7.RP.2 - Recognize and represent proportional relationships between quantities. 7.RP.2a - Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.2b - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	**Coming into this unit, students should have a strong foundation in:** ✓ Multiplication and division of rational numbers ✓ Setting up proportions for percents and measurement conversions **This unit builds to the following future skills and concepts:** ✓ Linear relationships ✓ Finding slope ✓ Dilations

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7.RP.2c - Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* 7.RP.2d - Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	
Additional Resources Materials to support understanding and enrichment	**"Learning Checks"** Questions Parents Can Use to Assess Understanding
✓ Teaching videos made by Wake County teachers ✓ WCPSS YouTube Channel – Math Playlist ✓ Understanding Rates and Unit Rates ✓ Finding Unit Rates – *The video that follows the first video is also helpful to understand Unit Price and then it finishes with practice questions for both concepts.* ✓ Example of Solving a Problem Using a Tape Diagram – *this is a review of 3rd through 5th grade standards.* ✓ Example of Solving a Problem Using a Double Number Line Diagram ✓ Proportionality in a Table ✓ Constant of Proportionality Found in Tables ✓ Proportionality in a Graph ✓ Constant of Proportionality Found in Graphs ✓ Solve Word Problems Using Proportions – *This video focuses on setting up the proportions. The videos that follow in the sequence show how to set up and solve proportions. There are some self-check problems in between some videos to make sure the student understands the concept before continuing on.* ✓ Determining If Figures are Similar ✓ Similar Figures – *Be sure to work through all four pages. They build on each other and provide more insight on the topic.* ✓ Finding a Scale Factor for Similar Figures ✓ Find Missing Side Lengths of Similar Figures Using Scale Factor	✓ What mathematical operations relate the numbers in each column of a ratio table? ✓ Why are unit rates important in the real world? ✓ What is the value of using a double number line diagram or tape diagram? ✓ What might be other ways to represent ratio relationships? ✓ What real-life situations do you think proportions could be useful for? ✓ What professions may use similar figures?

*** Please note**, the unit guides are a work in progress. If you have feedback or suggestions on improvement, please feel free to contact wakemiddle@wcpss.net.