

## Unit 2 Ratios and Proportional Relationships

### Grade 7 Math

#### Unit Description:

Students will add to their understanding of ratios by comparing unit rates and using proportions and complex fractions to solve problems. Proportions will also be used to solve real-world problems involving discount, tax, sales, percent increase/decrease, and markups.

#### Standards for Mathematical Practice

- MP.1 Make sense of problems and persevere in solving them.
- MP.2 Reason abstractly and quantitatively.
- MP.3 Construct viable arguments and critique the reasoning of others.
- MP.4 Model with mathematics.
- MP.5 Use appropriate tools strategically.
- MP.6 Attend to precision.
- MP.7 Look for and make use of structure.
- MP.8 Look for and express regularity in repeated reasoning.

#### Louisiana Student Standards for Mathematics (LSSM)

<b>RP – Ratios and Proportional Relationships</b>	
<b>A. Analyze proportional relationships and use them to solve real-world and mathematical problems.</b>	
7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks <math>\frac{1}{2}</math> mile in each <math>\frac{1}{4}</math> hour, compute the unit rate as the complex fraction <math>\frac{1}{2} / \frac{1}{4}</math> miles per hour, equivalently 2 miles per hour.</i>
7.RP.A.2	Recognize and represent proportional relationships between quantities. <ul style="list-style-type: none"> <li>a. 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.</li> <li>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</li> <li>c. Represent proportional relationships by equations. <i>For example, if total cost, <math>t</math>, is proportional to the number, <math>n</math>, of items</i></li> </ul>

		<p>purchased at a constant price, <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</p> <p>d. Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation, with special attention to the points <math>(0, 0)</math> and <math>(1, r)</math>, where <math>r</math> is the unit rate.</p>
7.RP.A.3		Use proportional relationships to solve multistep ratio and percent problems of simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.

**Enduring Understandings:**

- A ratio is a multiplicative comparison of two quantities.
- Ratios can often be meaningfully reinterpreted as fractions.
- A proportion is a relationship of equality between two ratios. In a proportion, the ratio of two quantities remains constant as the corresponding values of the quantities change

**Essential Questions:**

- What is the difference between a unit rate and a ratio?
- How is unit rate related to rate of change?
- Why are multiplicative relationships proportional?
- What characteristics define the graphs of all proportional relationships?