Unit 3
Ratios and Proportional Relationships

Acceleration to Algebra
(Grade 7 & 8 LSSM Standards)

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, markups, and scale drawings.

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.

Louisiana Student Standards for Mathematics (LSSM)

RP – Ratios and Proportional Relationships	
A. Analyze proportional relationships and use them to solve real-world and mathematical problems.	
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. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction ½ / ¼ miles per hour, equivalently 2 miles per hour.
7.RP.A.2	Recognize and represent proportional relationships between quantities. 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. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

	c. 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 $t = pn$. d. 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.
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.
G: Geometry	
A. Draw, construct, and describe geometrical figures and describe the relationship between them.	
7.G.A.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

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?
- What two-dimensional figures result from slicing prisms, pyramids, cubes, cylinders, and cones?