

Proportional Reasoning: Pre-Algebra

Stage 1 Desired Results		
ESTABLISHED GOALS: Competencies: - Students will demonstrate the ability to reason with quantities by recognizing, analyzing, and applying proportional relationships. - Students will demonstrate the ability to simplify numeric and algebraic expressions by applying the properties of operations and the arithmetic of real numbers. - Students will demonstrate the ability to solve equations and inequalities by applying the properties of equality, inequality, and rational expressions. - Students will demonstrate the ability to model real world problems by building and analyzing the appropriate expression, equation, or function. - Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials. - Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences. - Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style. Content Standards: 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. 7.RP.A.2 - Recognize and represent proportional relationships between quantities. 7.RP.A.2.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. 7.RP.A.2.b - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.A.2.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 $t = pn$. 7.RP.A.2.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 multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and	Transfer	
	<i>Students will be able to independently use their learning to make informed decisions involving the relationship between two quantities.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - in order to compare and determine equivalent ratios, proportional reasoning must be used. - maintaining a relationship is essential to proportionality.	ESSENTIAL QUESTIONS When is it important to maintain a relationship?
	Acquisition	
	<i>Students will know...</i> - when to use proportions to solve problems. - how to use proportional relationships to solve multi-step ratio and percent problems. - how to recognize and represent proportional relationships. - how to identify the constant of proportionality - a point (x,y) on the graph of a proportional relationship given a unit rate r, $y=rx$ and $x=yr$ and what this means in terms of the situation. - how (0,0) and (0, r) relate to the situation described. - the formula for percent increase/decrease. - the formula for percent error. - the formula for simple interest. vocabulary: proportion, simple interest, rate, constant of proportionality, rate of change, percent error, percent increase, percent decrease, coordinate plane, origin, unit rate	<i>Students will be skilled at...</i> - computing unit rates - determining whether two units have a proportional relationship or not by analyzing a table, graph, and equation. - writing and solve proportions. - using proportions, tables, and graphs to test for equivalent ratios. - determining the constant of proportionality from graphs, tables, equations, diagrams and verbal descriptions. - representing proportional relationships with equations - using proportional relationships to solve multi-step ratio and percent problems.

decrease, percent error. • 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. • • MP1 Make sense of problems and persevere in solving them. • MP2 Reason abstractly and quantitatively. • MP6 Attend to precision. • MP7 Look for and make use of structure. • MP8 Look for and express regularity in repeated reasoning.		
Content Area Literacy Standards		21st Century Skills
• RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. • RST.6-8.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 6-8 texts and topics</i> . • RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually. • RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.		• <i>reason effectively</i> • <i>use systems thinking</i> • <i>solve problems</i> • <i>use and manage information</i> • <i>access and evaluate information</i>

Stage 2 - Evidence	
<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

Stage 3 – Learning Plan	
Summary of Key Learning Events and Instruction	
<i>Language Arts Integration</i>	<i>Mathematics Integration</i>
• 1.OA.1 Use	• 1.OA.1 Use

<i>Technology Integration</i>	<i>District Materials</i>
• 1.OA.1 Use	