

Algebra I: Relationships Between Quantities and Reasoning with Equations

Stage 1 Desired Results		
ESTABLISHED GOALS: Competencies: - Students will demonstrate the ability to decontextualize (represent symbols) and contextualize (understand the meaning of quantities) by converting real-world situations into mathematical symbols for manipulation, and interpreting symbolic results back into practical contexts. - Students will demonstrate logical thinking and communication skills by building justified mathematical arguments, comprehending the justification of others, and critiquing their reasoning. - Students will demonstrate application skills by using mathematical concepts and symbols to represent, analyze, and solve problems arising in everyday life, society, and the workplace. - Students will demonstrate accuracy and clarity using correct mathematical terminology, specifying units of measure, and calculating with the degree of precision appropriate for the problem context. - Students will demonstrate structural awareness by discerning patterns and functional relationships within complex mathematical concepts to simplify and solve problems. - Students will demonstrate the ability to notice repetitive calculations or patterns, evaluate the reasonableness of results, and formulate general methods, formulas, or shortcuts while maintaining oversight of the process. - 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: - N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. - N.Q.2 Define appropriate quantities for the purpose of descriptive modeling. - N.Q.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. - A.SSE.1 Interpret expressions that represent a quantity in terms of its context. - Interpret parts of an expression, such as terms, factors, and coefficients. - Interpret complicated expressions by viewing one or more of their parts as a single entity. - A.CED.1 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. - A.CED.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. - A.CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Transfer	
	<i>Students will be able to independently use their learning to persevere in solving non-routine problems involving finding the value of an unknown and will be able to justify the validity of their solutions.</i>	
	Meaning	
	ENDURING UNDERSTANDINGS <i>Students will understand that...</i> - complicated real world problems can be modeled with mathematics. - variables are placeholders for unknown values. - there are rules that govern equality.	ESSENTIAL QUESTIONS How do we ensure equality?
	Acquisition	
	<i>Students will know...</i> - the addition, subtraction, multiplication, and division properties of equality. - that a linear equation has one, no, or infinite solutions. - how inverse operations operate. - the steps to maintaining equality in order to solve a linear equation with one variable. - that literal equations can be rewritten in terms of any of its variables. - the steps to maintaining the relationship of a linear inequality with one variable in order to solve it. - that an inequality's solutions can be expressed algebraically and graphically. - that absolute value problems have one, two, or no solutions in the real number system. - that absolute value inequalities can be solved using compound inequalities. - that equivalent rates and ratios can be represented using different units. <u>vocabulary:</u> equivalent equations, inverse operations, ratio, rate, unit rate, conversion factor, proportion, absolute value	<i>Students will be skilled at...</i> - evaluating expressions. - simplifying expressions, including performing the order of operations, combining like terms, and the distributive property. - solving one step, two-step, and multi-step equations, including with variables on both sides. - solving proportions, including using cross-multiplication. - using conversion factors to change units. - solving literal equations. - solving one step, two-step, and multi-step inequalities. - modeling real world problems algebraically. - interpreting solutions. - solving absolute value equations. - solving absolute value inequalities. - solving compound inequalities.

• A.REI.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. • A.REI.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. • MP1 Make sense of problems and persevere in solving them. • MP2 Reason abstractly and quantitatively. • MP4 Model with mathematics. • 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.9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. • RST.9-10.4 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 9-10 texts and topics</i>. • RST.9-10.5 Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., <i>force, friction, reaction force, energy</i>).		• <i>solve problems</i> • <i>assess and evaluate information</i> • <i>use systems thinking</i> • <i>reason effectively</i> • <i>make judgments and decisions</i> • <i>access technology efficiently</i>

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

Stage 3 – Learning Plan		
<i>Summary of Key Learning Events and Instruction</i>		
<i>Science Integration</i>	<i>College, Career, and Civic Life Integration</i>	<i>Technology Integration</i>
<i>District Materials</i>	<i>Distance Learning/Field Trips</i>	<i>Technology Resources</i>

