

Unit Title: “The Grazing Goat: Problem Solving and Inequality”

Course: Algebra I (Middle School)

Subject Area: Mathematics

Time Frame: 14 days

Standards

Algebra I Standards	Sunshine State Standards Benchmarks	NCEE New Standards
<p>The student will:</p> <p>2.1 State the coordinates of specified points on the number line and graph points on the number line when given the coordinates.</p> <p>5.1 Use order symbols to compare given real numbers.</p> <p>5.2 Use the addition property of order and multiplication property of order to solve simple inequalities.</p> <p>5.3 Solve compound inequalities.</p> <p>5.4 Graph the solutions sets of inequalities on number lines.</p> <p>9.3 Add and subtract algebraic fractions.</p> <p>9.4 Solve equations involving proportions.</p> <p>10.2 Solve systems of linear inequalities by graphing.</p>	<p>MA.A.1.3.2 The student understands the relative size of integers, fractions, and decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation; radical; absolute value; and ratios.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Compares and orders fractions, decimals, integers, and radicals using graphic models, number lines, and symbols. • Compares and orders numbers expressed in absolute value, scientific notation, integers, percents, numbers with exponents, fractions, decimals, radicals, and ratios. <p>MA.A.3.3.3 The student adds, subtracts, multiplies, and divides whole numbers, decimals, and fractions, including mixed numbers, so solve real-world problems using appropriate</p>	<p>The student:</p> <p>M1a Consistently and accurately adds, subtracts, multiplies, and divides rational numbers using appropriate methods and raises rational numbers to whole number powers.</p> <p>M1d Is familiar with characteristics of numbers (e.g., divisibility, prime factorization) and with properties of operations (e.g., commutativity and associativity), short of formal statements.</p> <p>M1g Order numbers with the > and < relationships and by location on a number line; estimates and compares rational numbers using sense of the magnitudes and relative magnitudes of numbers and of base-ten place values.</p> <p>M3a Discovers, describes, and generalizes patterns, including linear, exponential, and simple quadratic relationships, i.e., those of the form $f(n) = n^2$ or $f(n) = cn^2$, for constant c, including $A = \pi r^2$, and represents them with variables and</p>

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	<p>methods of computing, such as mental mathematics, paper and pencil, and calculator.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> Solves multi-step real-world problems involving fractions, decimals, and integers using appropriate methods of computation, such as mental computation, paper and pencil, and calculator. <p>MA.A.5.3.1 The student uses concepts about numbers, including primes, factors, and multiples to build number sequences.</p> <p><i>Expectations</i> The student: Knows if numbers are relatively prime. Applies number theory concepts to determine the terms in a real number sequence. Applies number theory concepts, including divisibility rules, to solve real-world or mathematical problems.</p> <p>MA.B.</p> <p>MA.D.1.3.1 The student describes a wide variety of patterns, relationships, and functions through models, such as manipulatives, tables, graphs,</p>	<p>expressions.</p> <p>M3b Represents relationships with tables, graphs, in the coordinate plane, and verbal or symbolic rules.</p> <p>M3c Analyzes tables, graphs, and rules to determine functional relationships.</p> <p>M3d Finds solutions for unknown quantities in linear equations and in simple equations and inequalities.</p> <p>M5b Make the basic choices involved in planning and carrying out a solution.</p> <p>M6a Accurately with arithmetic operations on rational numbers.</p> <p>M6b Knows and uses the correct order of operations for arithmetic computations.</p> <p>M6f Uses equations, formulas, and simple algebraic notations appropriately.</p>

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	<p>expressions, equations, and inequalities.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Read, analyze, and describe graphs of linear relationships. • Uses variables to represent unknown quantities in real-world problems. • Uses the information provided in a table, graph, or rule to determine if a function is linear and justifies reasoning. • Finds a function rule to describe tables of related input-output variables. • Predicts outcomes based upon function rules. <p>MA.D.1.3.2 The student creates and interprets tables, graphs, equations, and verbal descriptions to explain cause-and-effect relationships.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Interprets and creates tables and graphs (function tables). • Writes equations and inequalities to express relationships. • Graphs equations and inequalities to explain cause-and-effect relationships. • Interprets the meaning of the slope of a line from a graph depicting a real-world situation. 	

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand:</p> <ul style="list-style-type: none"> Learning algebra is more than developing proficiency in working with symbolic expression. The focus must include functions and an emphasis placed on non-symbolic representations such as graphs and tables. 	<ul style="list-style-type: none"> How can equations and inequalities express relationships we see in the everyday world? What does it mean to solve equations and inequalities? What properties of real numbers are useful to help confirm that two or more expressions are equivalent? How can the field properties be applied to solve problems? What properties of real numbers are needed to solve equations and inequalities? 	<p>Students will know</p> <ul style="list-style-type: none"> Key terms (i.e., algebraic expression, equivalent expressions, field properties, functions). <p>Students will be able to</p> <ul style="list-style-type: none"> State the coordinates of specified points on the number line and graph points on the number line when given the coordinates. Use order symbols to compare given real numbers. Use the addition property of order and multiplication property of order to solve simple inequalities. Solve compound inequalities. Graph the solutions sets of inequalities on number lines. Solve systems of linear inequalities by graphing.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> Add and Subtract Rational Expressions Students use addition and subtraction of rational numbers as models for addition and subtraction of rational expressions. Inequalities Students solve 	Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test	Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none">○ inequalities with one variable;○ linear and quadratic inequalities; and○ inequalities with absolute value.	Unit Project – The Grazing Goat	

