

Unit Title: “Difference of Square: Organizing Data”

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> <ol style="list-style-type: none"> 1.1 Simplify expressions with and without grouping symbols. 1.2 Find solution sets for equations and inequalities over a given domain. 2.1 State the coordinates specified points on the number line and graph points on the number line when given the coordinates. 2.2 Find sums of rational numbers. 2.3 Find differences of rational numbers. 2.4 Find products of rational numbers. 2.5 Determine the reciprocals of specified rational numbers. 2.6 Find quotients of rational numbers. 3.3 Use the distributive property to combine similar terms. <p>Review of: M/J Mathematics 1</p> <p>The student will:</p> <ol style="list-style-type: none"> 2.1 Explore the process of data investigation, such as posing questions, 	<p>MA.A.1.3.2 The student understands the relative size of integer, fractions, and decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation; radicals; 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.1.3.4 The student understands that numbers can be represented in a variety of equivalent forms, including integers, fractions, decimals, percents, scientific notation, exponents,</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>M1c Consistently and accurately applies and converts the different kinds and forms of rational numbers.</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 Orders numbers with the > and < relationships and by location on a number line; estimates and compares rational numbers using sense of magnitudes and relative magnitudes of numbers and of base-ten values.</p> <p>M5b Makes the basic choices involved in planning and carrying out a solution.</p>

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<p>collecting data, analyzing data, and making interpretations to answer questions.</p> <p>2.2 Represent data using line graphs, bar graphs, and coordinate graphs.</p> <p>2.4 Develop strategies for comparing data sets.</p>	<p>radicals, and absolute value.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Knows the relationships among fractions, decimals, and percents given a real-world context. • Simplifies expressions using integers, exponents, and radicals. • Knows equivalent forms of large and small numbers in scientific and standard notation. • Identifies and explains the absolute value of a number. <p>MA.A.3.3.1 The student understands and explains the effects of addition, subtraction, multiplication, and division on whole numbers, fractions, including mixed numbers, and decimals, including the inverse relationships of positive and negative numbers.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Knows the effects of the four basic operations on whole numbers, fractions, mixed numbers, decimals, and integers. • Knows the inverse relationship of positive and negative numbers. • Applied the properties of real numbers to solve problems (commutative, associative, distributive, identity, equality, 	<p>M6a Computes 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 notation appropriately.</p> <p>M7a Uses mathematical language and representations with appropriate accuracy, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs, and diagrams.</p>

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	<p data-bbox="827 306 1083 334">inverse, and closure).</p> <p data-bbox="768 396 905 423">MA.A.3.3.2</p> <p data-bbox="768 428 1314 607">The student selects the appropriate operation to solve problems involving addition, subtraction, multiplication, and division of rational numbers, ratios, proportions, and percents, including the appropriate application of the algebraic order of operations.</p> <p data-bbox="768 643 926 670">Expectations</p> <p data-bbox="768 675 919 703">The student:</p> <ul data-bbox="768 735 1325 1222" style="list-style-type: none"> <li data-bbox="768 735 1325 881">• Knows the appropriate operations to solve real-world problems involving integers, ratios, rates, proportions, numbers expressed as percents, decimals, and fractions. <li data-bbox="768 886 1325 1003">• Solves real-world problems involving integers, ratios, proportions, numbers expressed as percents, decimals, and fractions in two- or three-step problems. <li data-bbox="768 1008 1325 1125">• Solves real-world problems involving percents including percents greater than 100% (for example, percent of change, commission). <li data-bbox="768 1130 1325 1222">• Write and simplifies expressions from real-world situations using the order of operations. <p data-bbox="768 1287 905 1315">MA.A.3.3.3</p> <p data-bbox="768 1320 1287 1369">The student adds, subtracts, multiplies, and divides whole numbers, decimals, and</p>	

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	<p>fractions, including mixed numbers, to solve real-world problems using appropriate 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.4.3.1 The student uses estimation strategies to predict results and to check the reasonableness of results.</p> <p><i>Expectations:</i> The student:</p> <ul style="list-style-type: none"> Knows appropriate estimation techniques for a given situation using real numbers. Estimates to predict results and to check reasonableness of results. <p>MA.E.1.3.1 The student collects, organizes, and displays data in a variety of forms, including tables, line graphs, charts, bar graphs, to determine how different ways of presenting data can lead to different interpretations.</p>	

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	<p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Reads and interprets data displayed in a variety of forms including histograms. • Constructs and interprets displays of data and explains how different displays of data can lead to different interpretation. <p>MA.E.1.3.2 The student understands and applies the concepts of range and central tendency (mean, median, and mode).</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Finds the mean, median, and mode of a set of data. • Interprets measures of dispersion (range) and of central tendency. • Determines appropriate measure of central tendency for a given situation or set of data. <p>MA.E.2.3.2 The student determines odds for and odds against a given situation.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Predicts the mathematical odds for and against a specified outcome in a given real-world situation. 	

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	<p>MA.E.3.3.1 The student formulates hypotheses, designs experiments, collects and interprets data, and evaluates hypotheses by making inferences and drawing conclusions based on statistics (range, mean, median, and mode) and tables, graphs, and charts.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> • Formulates a hypothesis and designs an experiment. • Performs the experiment and collects, organizes, and displays the data. • Evaluates the hypothesis by making inferences and drawing conclusions based on statistical results. 	

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand:</p> <ul style="list-style-type: none"> • Exploring statistics is a dynamic process of data investigations that involves moving back and forth among four interconnected components: <ul style="list-style-type: none"> ○ Posing the questions; ○ Collecting the data; ○ Analyzing the data; and ○ Interpreting the data. 	<ul style="list-style-type: none"> • How can data be studied by using tables, graphs, or line plots? How can one determine which of these is most useful in a given situation? • What information can one get from a coordinate graph? What kind of relationship can be seen in a coordinate graph? • When two related quantities change, how 	<p>Students will know</p> <ul style="list-style-type: none"> • Key terms (e.g., axis, axes, data, survey, table, integers, absolute value, opposites, negative integer, positive integer, inverse operations, quadrant, coordinate, pair, linear, point of intersection, y-intercept). <p>Students will be able to</p> <ul style="list-style-type: none"> • Find sums and differences of integers.

Enduring Understanding	Essential Questions	Knowledge and Skills
<ul style="list-style-type: none"> The algorithms for addition, subtraction, and multiplication of integers can be meaningfully developed by use of integer tiles and the number lines. 	<p>can we tell whether the change is predictable?</p> <ul style="list-style-type: none"> What situations in daily life can be represented by positive or negative numbers. How can meaning be found for operations on negative numbers? Where can such operations be modeled? What does it mean to solve an equation? 	<ul style="list-style-type: none"> Find product and quotients of integers. Interpret graphs. Find solution sets for equations and inequalities over a given domain. Use the distributive property to combine like terms.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> The Beebopper Shoe Store Students place a dot (two colors, one each for male or female) on a coordinate grid to indicate their height and shoe size as they walk into the classroom. Students then record the class data on their own tables after discussions on the best way to organize the data. They review the use of tables and graphs to represent data. Integer Tiles Students use integers tiles to develop algorithms for addition, subtraction, and multiplication of integers. Students consider that any given integer can be represented with the tiles in many different ways. All problems are built and the tiles recorded with a sketch. Guess and Check Tables Often reluctant to risk guessing, students are asked to consider the notion that no guess is “wrong” because all guesses give us information that help lead to a solution. Students make Guess and Check tables and carefully identify 	<p>Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test Unit Project – Team presentations</p>	<p>Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.</p>

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<p>and label each column including the "Guess" which will later be represented by a variable.</p> <ul style="list-style-type: none"> • Combining Like Terms Students use algebra tiles to combine like terms. 		