

Unit Title: “The Birthday Party Pinata: Writing Equations from Diagrams”

Course: Algebra I (Middle School)

Subject Area: Mathematics

Time Frame: 13 days

Standards

Algebra I Standards	Sunshine State Standards Benchmarks	NCEE New Standards
<p>The student will:</p> <p>8.1 Arrange sets of real numbers in increasing or decreasing order.</p> <p>8.2 Find fractions or decimals between any two given fractions or decimals.</p> <p>8.3 Change fractions to terminating or repeating decimals and change terminating or repeating decimals to fractions.</p> <p>8.4 Simplify radical expression involving square roots.</p> <p>8.5 Add, subtract, and multiply radicals.</p>	<p>MA.A.1.3.3 The student understands concrete and symbolic representations of rational numbers and irrational number in real-world situations.</p> <p>Expectations The student:</p> <ul style="list-style-type: none"> • Knows examples of rational and irrational numbers in real-world situations. • Describes the meanings of rational and irrational numbers using physical or graphical displays. • Constructs models to represent rational and irrational numbers. <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, radicals, and absolute value.</p> <p><i>Expectations</i></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 a whole number power.</p> <p>M1b Uses and understands the inverse relationships between addition and subtraction, multiplication and division, and exponentiation and root-extraction; uses inverse operations to determine unknown quantities in equations.</p> <p>M1c Consistently and accurately applies and converts the different kinds and forms of rational numbers.</p> <p>M1g Orders 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 number and of base-ten place values.</p> <p>M7a Uses mathematical language and representations with appropriate</p>

Algebra I Standards	Sunshine State Standards Benchmarks	NCEE New Standards
	<p>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>accuracy, including numerical tables and equations, simple algebraic equations and formulas, charts, graphs, and diagrams.</p>

Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Student will understand:</p> <ul style="list-style-type: none"> The early Greek mathematics recognized the need for irrational numbers as they searched for a ratio of integers to represent the length of the sides of a square with certain given areas, such as 2 square units. The square root of 2 is an irrational number, meaning that it cannot be written as a ratio of two integers. The Pythagorean Theorem is a fundamental relationship connecting geometry and algebra. 	<ul style="list-style-type: none"> What is the length of a side of a square of a certain area? What is the relationship among the lengths of the sides of a right triangle? How can the Pythagorean Theorem be used to solve problems? 	<p>Students will know</p> <ul style="list-style-type: none"> Key terms (i.e., hypotenuse, irrational number, perpendicular, Pythagorean Theorem, rational number, real numbers, repeating decimal, square root, terminating decimal). <p>Students will be able to</p> <ul style="list-style-type: none"> Arrange sets of real numbers in increasing or decreasing order. Find fractions or decimals between any two given fractions or decimals. Change fractions to terminating or repeating decimals and change terminating or repeating decimals to fractions. Simplify radical expression involving square roots. Add, subtract, and multiply radicals.

Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> Birthday Party Pinata Student sketch the Party Piñata problem and record data gathered and proceed to write a “word equation” to describe the relationship they see in the pattern. Although some students will know the formula $a^2 + b^2 = c^2$, the relationship summarized in this form should be avoided. Pythagorean 	<p>Check-Up 1 Quiz A Check-Up 2 Quiz B Unit Test</p>	<p>Teacher observations of students during work on performance tasks. Accountable talk during work on performance tasks.</p>

Theorem should be phrased in word equation form.

- **The Hypotenuse**
Using the Pythagorean Theorem to find lengths for the hypotenuse of given right triangle, students develop the formula for finding the distance between two points.
- **Simplifying Expressions with Radicals**
Student work in teams to complete exercises that lead to development of strategies and laws for simplifying square roots.