

**Unit Title:** “Choosing a Phone Plan: Writing and Solving Equations”

**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>1.4 Use appropriate mathematical symbols to translate word phrases into variable expressions and word sentences into equations or inequalities.</p> <p>4.1 Solve equations using the addition property of equality or subtraction property of equality.</p> <p>4.2 Solve equations using the multiplication property of equality or division property of equality.</p> <p>4.3 Solve first degree literal equations or formulas for a specified variables.</p>	<p>MA.A.1.3.1 The student associates verbal names, written word names, and standard numerals with integers, fractions, decimals; numbers expressed as percents; numbers with exponents; numbers in scientific notation; radicals; absolute value; and ratio.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> <li>Knows word names and standard numerals for integers, fractions, decimals, numbers expressed as percents, numbers with exponents, numbers expressed in scientific notation, absolute value, radicals, and ratios.</li> </ul> <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></p>	<p>The student:</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> <p>M3a Discovers, describes, and generalizes patterns, including linear, exponential, and simple quadratic relationships, i.e., those of the form <math>f(n) = n^2</math> or <math>f(n) = cn^2</math>, for constant <math>c</math>, including <math>A = \pi r^2</math>, and represents them with variables and 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>M6g Reads and organizes data on charts</p>

Algebra I Standards	Sunshine State Standards Benchmarks	NCEE New Standards
	<p>The student:</p> <ul style="list-style-type: none"> <li>• Interprets and creates tables and graphs (function tables).</li> <li>• Writes equations and inequalities to express relationships.</li> <li>• Graphs equations and inequalities to explain cause-and-effect relationships.</li> <li>• Interprets the meaning of the slope of a line from a graph depicting a real-world situation.</li> </ul> <p>MA.D.2.3.1 The student represents and solves real-world problems graphically, with algebraic expression, equations, and inequalities.</p> <p><i>Expectations</i> The student:</p> <ul style="list-style-type: none"> <li>• Translates verbal expressions and sentences into algebraic expressions, equations, and inequalities.</li> <li>• Translates algebraic expressions, equations, or inequalities representing real-world relationships into verbal expressions or sentences.</li> <li>• Solve single- and multi-step linear equations and inequalities in concrete or abstract form.</li> <li>• Graph linear equations on the coordinate plane using tables of values.</li> <li>• Graphically displays real-world situations represented by algebraic equations or inequalities.</li> </ul>	<p>and graphs, including scatter plots, bar, line, and circle graphs, and Venn diagrams; calculates mean and median.</p>

<b>Algebra I Standards</b>	<b>Sunshine State Standards Benchmarks</b>	<b>NCEE New Standards</b>
	<ul style="list-style-type: none"> <li>• Evaluate algebraic expressions, equations, and inequalities by substituting integral values for variables and simplifying the results.</li> <li>• Simplifies algebraic expressions that represent real-world situations by combining like terms and applying the properties of real numbers.</li> </ul>	

## Desired Results

Enduring Understanding	Essential Questions	Knowledge and Skills
<p>Students will understand:</p> <ul style="list-style-type: none"> <li>Learning algebra is more than developing proficiency in working with symbolic expressions. The focus must include functions and an emphasis placed on non-symbolic representations such as graphs and tables.</li> </ul>	<ul style="list-style-type: none"> <li>How can an equation express a relationship we see in the everyday world?</li> <li>What does it mean to solve an equation?</li> <li>What tools can be used to solve equations?</li> <li>What properties of real numbers are useful to help confirm that two or more expression are equivalent?</li> <li>How can the distributive property be applied to solve problems?</li> <li>How can the commutative property be applied to solve problems?</li> <li>What properties of real numbers are needed to solve linear equations?</li> </ul>	<p>Students will know</p> <ul style="list-style-type: none"> <li>Key terms (e.g., algebraic expression, commutative property of addition, commutative property of multiplication, distributive property, equivalent expressions, expanded form, factored form, function).</li> </ul> <p>Students will be able to</p> <ul style="list-style-type: none"> <li>Use appropriate mathematical symbols to translate word phrases into variable expressions and word sentences into equations or inequalities.</li> <li>Solve equations using the addition property of equality or subtraction property of equality.</li> <li>Solve equations using the multiplication property of equality or division property of equality.</li> <li>Solve first degree literal equations or formulas for a specified variable.</li> </ul>

## Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> <li><b>Guess and Check Tables</b> Students move from Guess and Check tables to writing equations.</li> </ul>	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"> <li>• <b>Cups and Tiles</b> Students use cups and tiles as a physical representation of the steps needed in finding solutions to equations.</li> <li>• <b>Working Backwards</b> Students are asked to write the steps to following wrapping a gift for a friend. They are then asked for the steps needed in “unwrapping” the package. Students solve equations by “undoing” what has been done to the variable to find the “original number.”</li> </ul>	Unit Project – Choosing a Phone Plan	

