

**Unit Title: “Moving Straight Ahead”**

**Course: Middle School Mathematics**

**Subject Area: Mathematics**

**Time Frame: 20 days**

**Standards**

<b>Middle School Mathematics Standards</b>	<b>Sunshine State Standards Benchmarks</b>	<b>NCEE New Standards</b>
<p>The student will:</p> <p>14.1 Represent the relationships among variable in a variety of ways, including the use of words, tables graphs, and symbols</p> <p>14.2 Determine an appropriate range of values for independent and dependent variables.</p> <p>14.3 Solve linear equations.</p> <p>14.4 Find the slope of a line from a graph, a table, or an equation.</p> <p>14.5 Find the y-intercept of a liner equation from its table, graph, or equations.</p> <p>14.6 Write a linear equation given the slope and y-intercept.</p> <p>14.7 Find a solution common to two linear equations by graphing or creating tables.</p>	<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"><li>• Interprets and creates tables, function tables, and graphs (all four quadrants).</li><li>• Writes expressions and equations to describe relationships.</li><li>• Graphs equations to explain cause-and-effect relationships.</li></ul> <p>MA.D.2.3.1 The student represents and solves real-world problems graphically with algebraic expressions, equations, and inequalities.</p>	<p>The student:</p> <p>M3b Represents relationships with tables, graphs, in the coordinate plane, and verbal or symbolic rules.</p> <p>M3d Finds solutions for unknown quantities in linear equations and in simple equations and inequalities.</p>

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	<p data-bbox="772 305 926 329"><i>Expectations</i></p> <p data-bbox="772 337 919 362">The student:</p> <ul data-bbox="772 402 1318 954" style="list-style-type: none"> <li data-bbox="772 402 1318 492">• Translates verbal expressions and sentences into algebraic expressions and equations.</li> <li data-bbox="772 500 1318 613">• Translate algebraic expressions, equations, or formulas representing real-world relationships into verbal expressions or sentences.</li> <li data-bbox="772 621 1318 735">• Given an algebraic equation or expression of real-world application, substitutes integral values for variables and simplifies the results.</li> <li data-bbox="772 743 1318 824">• Uses pictures, models, manipulatives or other strategies to solve one-step and simple multi-step linear equations.</li> <li data-bbox="772 833 1318 889">• Graphs solutions to equations and inequalities on a number line.</li> <li data-bbox="772 898 1318 954">• Graph lines equations on the coordinate plane from a table of values.</li> </ul> <p data-bbox="772 1019 905 1044">MA.D.2.3.2</p> <p data-bbox="772 1052 1287 1141">The student uses algebraic problem-solving strategies to solve real-world problems involving linear equations and inequalities.</p> <p data-bbox="772 1174 926 1198"><i>Expectations</i></p> <p data-bbox="772 1206 919 1230">The student:</p> <ul data-bbox="772 1271 1318 1377" style="list-style-type: none"> <li data-bbox="772 1271 1318 1377">• Knows how to solve simple equations and inequalities representing real-world situations, using pictures, models, manipulatives, or other strategies.</li> </ul>	

<b>Middle School Mathematics Standards</b>	<b>Sunshine State Standards Benchmarks</b>	<b>NCEE New Standards</b>
	<ul style="list-style-type: none"><li data-bbox="772 310 1318 396">• Uses concrete materials to solve equations and explain reasoning orally or in writing.</li></ul>	

## Desired Results

<b>Enduring Understanding</b>	<b>Essential Questions</b>	<b>Knowledge and Skills</b>
<p>Students will understand</p> <ul style="list-style-type: none"><li>• A relationship is linear if there is a constant rate of change between the two variables.</li></ul>	<ul style="list-style-type: none"><li>• How can an equation express a relationship we see in the everyday world?</li><li>• When two related quantities change, how can we tell whether the change is predictable? How can we tell whether it can be expressed by a mathematical equation?</li><li>• How can the graph made from a table of specific values help us predict other values? How accurate can such predictions be?</li><li>• Can graphs help us predict changes between related variables if the variables are not related in a linear way?</li><li>• What does it mean to solve an equation?</li><li>• What tools can be used to solve equations?</li><li>• How can one decide which tool or method is best?</li><li>• What kinds of everyday problems can be solved by using mathematical tables and equations?</li></ul>	<p>Students will know</p> <ul style="list-style-type: none"><li>• Key terms (e.g., coefficient, coordinate pair, linear, linear relationship, point of intersection, rise, run, slope, y-intercept)</li></ul> <p>Students will be able to</p> <ul style="list-style-type: none"><li>• Represent the relationships among variables in a variety of ways, including the use of words, tables, graphs, and symbols.</li><li>• Identify variables and determine an appropriate range of values for independent and dependent variables.</li><li>• Use graphing calculators to investigate linear relationships.</li><li>• Communicate and interpret information from a variety of representations.</li><li>• Recognize linear situations in all forms of representation: written descriptions, tables, graphs, and symbols.</li><li>• Solve linear functions of the form <math>y = mx + b</math>.</li><li>• Find the y-intercept of a linear equation from its table, graph, or equations and interpret its meaning.</li><li>• Write a linear equation given the slope and y-intercept.</li></ul>

## Acceptable Evidence

Performance Tasks	Quizzes, Test, and Work Samples	Observations and Dialogues
<ul style="list-style-type: none"> <li>• <b>Predicting From Patterns</b> How can we determine whether a relationship is linear? Students conduct one or two experiments and observe that the data collected appear to lie in a straight line. Linear relationship is describe, at present, as one whose graph is a straight line.</li> <li>• <b>Walking Rates</b> Students take a closer look at rates in multiple representations. Student explore constant rate of change in tables, graphs, and equations. They investigate the change in the rate and its effect on various representations. The y-intercept is introduced informally.</li> <li>• <b>Exploring Lines with a Graphing calculator</b> Student use the graphing calculator to explore the effects of changing <math>m</math> and <math>b</math> in graphs of the form <math>y = mx + b</math>. The intersection of two lines is introduced, and students use the graphing calculator to find the intersection point.</li> <li>• <b>Solving Equations</b> Students develop a symbolic method for solving an equations of the form <math>y = mx + b</math> using the idea of “undoing the operations.” The arithmetic reasoning then leads to a “balancing the equations” method of solving an equation.</li> <li>• <b>Exploring Slope</b> Students continue to develop their understanding that for a situation to be linear there must be a constant rate of change between the two variables. The steepness of a set of stairs is used to model the concept of the slope of a line. Students find the constant rate or slope from a table; find the slope of a line given two points; and determine whether a line has a positive slope, a negative slope, or neither.</li> <li>• <b>Writing an Equations for a line</b> Students find the equation of a line from two pieces of information: the slope and the y-intercept</li> </ul>	<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>

