

**Mathematics**  
**Pre-Calculus A**  
**Unit 1: Linear Relations and Functions**

<b>Essential Understandings</b>	<ul style="list-style-type: none"> <li>▪ Mathematics can be used to model real-life situations.</li> </ul>
<b>Essential Questions</b>	<ul style="list-style-type: none"> <li>▪ What are the properties of Algebra and how are these used to solve linear equations?</li> <li>▪ What types of data are modeled by linear equations?</li> <li>▪ What are the properties of inequalities?</li> <li>▪ How is slope calculated and what does it represent?</li> </ul>
<b>Essential Knowledge</b>	<ul style="list-style-type: none"> <li>▪ The associative, commutative, and distributive properties along with the addition and multiplication properties of equality are used to solve linear equations.</li> <li>▪ Linear regression is used to find the line of best fit for various data sets.</li> <li>▪ An inequality is a statement that compares two expressions by using symbols</li> <li>▪ Multiplication or division by a negative number reverses the inequality.</li> <li>▪ Slope is the ratio of the change in the dependent variable to the independent variable.</li> </ul>
<b>Vocabulary</b>	<ul style="list-style-type: none"> <li>▪ <u>Terms:</u> <ul style="list-style-type: none"> <li>○ Associative, distributive, commutative properties</li> <li>○ Addition and multiplication properties of equalities and inequalities</li> <li>○ Linear function</li> <li>○ Slope, ratio and rate of change</li> <li>○ Y-intercept, X-intercept</li> <li>○ Slope-intercept form of a linear equation</li> <li>○ Point-slope form of a linear equation</li> <li>○ General or standard form of a linear equation</li> <li>○ Correlation and line of best fit</li> <li>○ Linear regression</li> </ul> </li> </ul>
<b>Essential Skills</b>	<ul style="list-style-type: none"> <li>▪ Apply order of operation.</li> <li>▪ Use properties of equalities and inequalities to write and solve linear equations.</li> <li>▪ Graph linear equations and inequalities.</li> <li>▪ Interpret the real world meaning to the slope and Y-intercept.</li> <li>▪ Analyze and graph data using technology.</li> </ul>

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<b>Related Maine Learning Results</b>	<p><u>Mathematics</u>  D. Algebra  Equations and Inequalities  D2.Students solve families of equations and inequalities.</p> <ol style="list-style-type: none"> <li>a. Solve systems of linear equations and inequalities in two unknowns and interpret their graphs.</li> <li>b. Solve quadratic equations graphically, by factoring in cases where factoring is efficient, and by applying the quadratic formula.</li> <li>c. Solve simple rational equations.</li> <li>d. Solve absolute value equations and inequalities and interpret the results.</li> <li>e. Apply the understanding that the solution(s) to equations of the form <math>f(x) = g(x)</math> are x-value(s) of the point(s) of intersection of the graphs of <math>f(x)</math> and <math>g(x)</math> and common outputs in table of values.</li> <li>f. Explain why the coordinates of the point of intersection of the lines represented by a system of equations is its solution and apply this understanding to solving problems.</li> </ol> <p>Functions and Relations  D4.Students understand and interpret the characteristics of functions using graphs, tables, and algebraic techniques.</p> <ol style="list-style-type: none"> <li>a. Recognize the graphs and sketch graphs of the basic functions.</li> <li>b. Apply functions from these families to problem situations.</li> <li>c. Use concepts such as domain, range, zeros, intercepts, and maximum and minimum values.</li> <li>d. Use the concepts of average rate of change (table of values) and increasing and decreasing over intervals, and use these characteristics to compare functions.</li> </ol>
<b>Sample Lessons And Activities</b>	<ul style="list-style-type: none"> <li>▪ Solve equations and inequalities with variables on both sides using properties of Algebra. Identify identities and contradictions.</li> <li>▪ Use a data set to make a scatter plot, find the correlation coefficient and the line of best fit.</li> <li>▪ Graph and determine the equation of a line using slope-intercept, point-slope and general form.</li> </ul>
<b>Sample Classroom Assessment Methods</b>	<ul style="list-style-type: none"> <li>▪ Evaluate homework</li> <li>▪ Quizzes</li> <li>▪ Chapter test</li> </ul>
<b>Sample Resources</b>	<ul style="list-style-type: none"> <li>▪ <u>Publications:</u> <ul style="list-style-type: none"> <li>○ <u>Advanced Mathematical Concepts</u> - Glencoe</li> </ul> </li> <li>▪ <u>Other Resources:</u> <ul style="list-style-type: none"> <li>○ Graphing calculators</li> </ul> </li> </ul>

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	○ The A+ learning system for remediation
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