

Haddon Township High School
Course Overview

Subject Area: Math
Course Name: Algebra 1

Summary: This course is designed to establish a strong foundation for future math classes with emphasis on algebraic language, concepts and skills. Major concepts include working with real numbers, solving equations, polynomials, factoring polynomials, fractions, applying fractions, introduction to functions, systems of linear equations, inequalities, rational and irrational numbers and the Quadratic Formula. Word problems and applications are infused throughout the course.

| Unit Title | Student Learning Target | Standards | Resources | Assessment |
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| Unit 1 Numerical Reasoning | <i>Students will ...</i> <ul style="list-style-type: none"> • Identify Rational numbers • Simplify Square Roots Order numeric values from least to greatest | N-RN.2. Rewrite expressions involving radicals and rational exponents using the properties of exponents. | Equipment needed: Worksheets, Notebook, SmartBoard, Computer Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet, | Unit Review 1 day, Unit Test 1 day |
| Unit 2 Properties of Real Numbers | <i>Students will ...</i> <ul style="list-style-type: none"> • Add, Subtract, Multiply and Divide Rational and Irrational Expressions • Use Absolute Value to Evaluate Expressions • Understand difference of Exact, Estimation / Approximation Perform Numeric Operations using Matrices | N.RN.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. <i>For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.</i> N.RN.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents. N.RN.3 Explain | Equipment needed: Worksheets, Notebook, SmartBoard, Computer Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet, | Unit Review 1 day, Unit Test 1 day, Project |

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| | | <p>why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.</p> | | |
| <p>Unit 3</p> <p>Ratio Rates and Conversions</p> | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Solve Proportions • Find unknown measures of the sides of similar geometric objects • Solve percent problems <p>Use proportion to compare unlike objects</p> | <p>N.Q.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays</p> <p>N.Q.2 Define appropriate quantities for the purpose of descriptive modeling</p> <p>N.Q.3 Choose a level of accuracy appropriate to limitation on measurement when reporting quantities</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | <p>Unit Review 1 day, Unit Test 1 day, Project</p> |
| <p>Unit 4</p> <p>Data Statistics and Probability</p> | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Design surveys and evaluate results • Use permutations and combinations • Find probabilities of single and compound | <p>S-ID.1 Represent data with plots on the real number line (dot plots, histograms, and box plots).</p> <p>S-ID.2 Use statistics appropriate to</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | <p>Unit Review 1 day, Unit Test 1 day, Project</p> |

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| | <p>events</p> <ul style="list-style-type: none"> • Design and use simulations <p>Use Venn Diagrams to solve logic problems</p> | <p>the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</p> <p>S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</p> <p>S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> <p>a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.</p> <p>c. Fit a linear function for a scatter plot that suggests a linear association.</p> <p>S-IC.1. Underst and statistics as a process for making inferences about population parameters based on a random sample from that</p> | | |
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| | | <p>population.</p> <p>S-CP.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").</p> <p>S-CP.2. Understand and that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.</p> | | |
| <p>Unit 5</p> <p>Variables in Algebra</p> | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Recognize Constants, Coefficients, Variables, Expressions, Equations, Inequalities • Transfer Words to Algebra • Identify Properties • Solving Equations and Inequalities for a single variable • Understand that there can be Unique, Infinite, and No Solutions <p>Graphing Solutions on</p> | <p>A-APR.1. Understand and that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.</p> <p>A-APR.7 Understand and that rational expressions form a</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | <p>Unit Review 1 day, Unit Test 1 day, Project</p> |

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| | <p>Number Line</p> | <p>system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.</p> <p>A-REI.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</p> <p>A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.</i></p> | | |
| <p>Unit 6 Solving Word Problems</p> | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Assign variables and Constants to model situations • Create Algebraic Equations to represent problem • Solve Equations <p>Translate Solution back to problem</p> | <p>A-CED.1. Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i></p> <p>A-CED.3 Represent constraints by equations or inequalities, and by systems of</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | <p>Unit Review 1 day, Unit Test 1 day, Project</p> |

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| | | <p>equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. <i>For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.</i></p> <p>A-CED.4</p> <p>Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. <i>For example, rearrange Ohm's law $V = IR$ to highlight resistance R.</i></p> | | |
| <p>Unit 7</p> <p>Numerical and Algebraic Expressions</p> | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> • Use properties of exponents to simplify expressions • Add, Subtract, Multiply and Divide Polynomial Expressions <p>Utilize Distance and MidPoint Formulas</p> | <p>A-SSE.1 Interpret expressions that represent a quantity in terms of its context. □</p> <ul style="list-style-type: none"> • Interpret parts of an expression, such as terms, factors, and coefficients. <p>Interpret complicated expressions by viewing one or more of their parts as a single entity. <i>For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.</i></p> <p>A-SSE.2 Use the</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | <p>Unit Review 1 day, Unit Test 1 day Project</p> |

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| | | structure of an expression to identify ways to rewrite it. | | |
| Unit 8 Linear Relationships | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> Identify Domain and Range of Functions Introduce $F(x) = y$ Recognize Arithmetic Sequences with Next = Now + m Calculate Slope given two points <p>Solve for y-intercept given slope and a point (x,y)</p> | <p>A-REI.10. Understand and that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).</p> <p>A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | Unit Review 1 day, Unit Test 1 day, Project |
| Unit 9 Linear Graphing | <p><i>Students will ...</i></p> <ul style="list-style-type: none"> Recognize equations that represent linear functions in multiple forms Be able to graph linear equations in multiple forms (slope-intercept, standard and point-slope form). Recognize and Graph horizontal and vertical lines Graph Absolute value linear equations <p>Solve and Graph Linear Inequalities</p> | <p>F-LE.1 Construct and compare linear models and solve problems</p> <ol style="list-style-type: none"> Distinguish between situations that can be modeled with linear functions. <ol style="list-style-type: none"> Prove that linear functions grow by equal differences over equal intervals Recognize situations in which one quantity changes at a constant rate per unit Interval <p>F-LE.2 2.</p> | <p>Equipment needed: Worksheets, Notebook, SmartBoard, Computer</p> <p>Teacher Resources: SmartBoard Software, Quizzes, Test, Worksheet,</p> | Unit Review 1 day, Unit Test 1 day, Projects |

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| | | <p>Construct linear functions, including arithmetic sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table)</p> <p>F-LE.5 5. Interpret expressions for linear functions in terms of the situation they model.</p> | | |
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