Greenwich Public Schools Curriculum Overview

Algebra 1/Geometry Course 2

Personalized learning is achieved through standards-based, rigorous and relevant curriculum that is aligned to digital tools and resources.

Note: Teachers retain professional discretion in how the learning is presented based on the needs and interests of their students.

Course Description

Algebra 1/ Geometry Course 2
Full Year
022420   6 Blocks   1 Credit
Prerequisites: Algebra 1/Geometry Course 1
This is the second course in a three-year sequence which integrates algebra and geometry, developing and extending concepts from Course 1. Students' experiences in the second year build on previously taught algebraic concepts and solving basic equations to solving more complicated multi-step equations and the study of linear equations. Knowledge of shapes and solids will be extended over the course of the year, including topics of perimeter, area, surface area and volume. Students will develop practical knowledge of measurement and calculation, including problems involving geometric probability and analysis of compound shapes. Throughout the course there will be an emphasis on problem solving, using technology and real-life application.

Unit Guide

- Unit 1 Connections to Algebra
- Unit 2 Solving Multi-step Equations
- Unit 3 Geometry Review
- Unit 4 Shapes and Perimeter
- Unit 5 Area (this unit continues after the Midterm Exam)
- Midterm Review & Midterm Exam*
- Unit 6 Volume
- Unit 7 Surface Area
- Unit 8 Probability
- Unit 9 Slope and Graphing Direct Variation
- Unit 10 Writing Linear Equations
- Final Review & Final Exam*

Note: Semester exam review packets, answer keys and formula sheets can be found by joining our **Schoology** *Math Department Review Course*, using COURSE access code P9V9X-H6V37.

Mathematical Practices

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.

- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.

Enduring Understandings:

- *Unit 1*:
  - There is an established order of operations that must be followed to simplify expressions
  - Rational numbers can be represented as fractions, decimals and percents.
  - Fractions, decimals, and percents can be used to solve real world applications including tax, tip, discounts, percent increases and decreases
  - A square root is a number that produces a specified quantity when multiplied by itself
  - Two or more expressions may be equivalent, even when their symbolic forms differ
  - Properties of real numbers, properties of equality, and inverse operations can be used to obtain a solution to a linear equation
- *Unit 2*: Analyze, model, and solve mathematical situations using algebraic equations.
  - There is a precise order to solving multi-step equations
  - Multiplying the sum of two or more addends by a number will give the same result as multiplying each addend individually by the number and then adding the products together
  - Variables and operations can be used to represent real world relationships
- *Unit 3*:
  - Angles can be classified as acute, obtuse, or straight based off of their measure.
  - Angle pairs are formed by intersecting lines
  - The Pythagorean Theorem can be used to solve for the missing side of a right triangle
  - The Pythagorean Theorem can be used to determine if a triangle is a right triangle
  - Points, rays, and lines are named and used to identify important parts of two-dimensional shapes
  - The midpoint is the exact middle point of a line segment
  - The midpoint bisects the line segment into two congruent segments
- *Unit 4*:
  - Triangles can be classified by sides and angles
  - Polygons can be classified by the number of sides
- *Unit 5*:
  - Dimension is a measure of the width, height, or length of a figure
  - Area is the measure of the region inside of a two-dimensional figure and it is measured by determining the square units that cover the figure
  - The area of a polygon can be determined by composing rectangles or decomposing it into triangles
- *Unit 6*:
  - Volume is the measure of a three-dimensional figure and it is measured by determining the cubic units that fill the figure.
- *Unit 7*:
  - Surface area is the area of all of the faces of a three-dimensional figure and is measured by wrapping or covering a figure
  - To find the surface area of a three-dimensional figure, find the sum of the areas of all the surfaces of the figure
  - You can find the volume of a prism, cylinder, pyramid, and cone when you know the area of the base and the height of the figure and spheres when you know the radius

- *Unit 8*:
  - Mean, median and mode are the indicators of the center of a data set.
  - The median is the middle number in a data set arranged from least to greatest or greatest to least.
  - The mode is the number that appears most often in a data set.
- *Unit 9*:
  - The distance formula can be used to find the distance between two points on the coordinate plane
  - The midpoint formula can be used to find the midpoint of two points on the coordinate plane
  - Slope is a measure of steepness and direction of a line and is calculated by the rise divided by the run
  - Direct variation is used to represent when one variable changes in proportion to the other
  - Linear equations can be graphed using a table of values
  - A line on a graph can be represented by a linear equation
  - The relationship between two lines can be determined by comparing their slopes and y-intercepts
- *Unit 10*:
  - The equation of a line can be written from two points, a slope and y-intercept, and a point and a slope.

Essential Questions:

- *Unit 1*:
  - How can I simplify numerical expressions?
  - Why are multiplication and division done before addition and subtraction?
  - How can we solve real life problems using ratios and proportions?
  - How can we use properties to write equivalent expressions?
- *Unit 2*:
  - What are inverse operations?
  - How can we solve for a variable in a mathematical equation?
  - How can you analyze, model, and solve mathematical situations using algebraic equations?
- *Unit 3*:
  - How do you classify angles?
  - How do you identify whether an angle is acute, obtuse, or straight?
  - How can you find the measures of angles formed by intersecting lines?
  - How do you find the distance and midpoint of a segment?
- *Unit 4*:
  - How can you find the measure of the third angle of a triangle if you know the measure of the other two angles?
- *Unit 5*:
  - What is area?
  - How do you find the area of a parallelogram?
  - How do you find the area of a triangle?
  - How do you find the area of a trapezoid?
  - How do you find the area of a circle?
- *Unit 6*:
  - How do you find the volume of a right rectangular prism?
  - How do you find the volume of a cube?
  - How do you find the volume of a cylinder?

- ○ How do you find the volume of a pyramid?
  - ○ How do you find the volume of a cone?
  - ○ How do you find the volume of a sphere?
- *Unit 7*:
  - ○ What is surface area?
  - ○ How can the surface area of a three-dimensional figure be measured?
  - ○ How do you find the surface area of a prism and cube?
  - ○ How do you find the surface area of a cylinder?
- *Unit 8*:
  - ○ What is the mean, median and mode for a given data set?
  - ○ How can I measure a data set?
  - ○ What is the range of a data set?
- *Unit 9*:
  - ○ How do I find the x- and y– intercepts given a linear equation or graph?
  - ○ What does k represent in a direct variation?
  - ○ What does the slope of a line indicate about the line?
  - ○ What information does the equation of a line give you?
- *Unit 10*:
  - ○ How do you write an equation if you are given a slope and y-intercept?
  - ○ How do you write an equation if you are given a point and a slope?
  - ○ How do you write an equation if you are given two points?

Resources and Assured Experiences

GHS Capstone Task:
Vision of the Graduate #3 - Explore, define, and solve complex problems
- Painting U-Shaped Area - to complete after Unit 5 Area

Extra Resources:
- CT DoE Math Model Curriculum Materials for Algebra 1
- Arlington Algebra Project

Quarterly Grading

Quarter Grades will be determined using the following components:
- Participation (includes Classwork) = 20%
- Preparation (includes Homework) = 20%
- Assessments (both Summative & Formative) = 60%

Connecticut Common Core State Standards

- *Unit 1*: CCSS.MATH.CONTENT.7.EE.A.1; 7.NS.A.1.D; 6.RP.A.1; 7.RP.A.2.C, A.3; 8.EE.A.2.
- *Unit 2*: CCSS.MATH.CONTENT.HSA.CED.A.1; 8.EE.C.7.B.
- *Unit 3*: CCSS.MATH.CONTENT.HSG.CO.A.1, C.9.
- *Unit 4*: CCSS.MATH.CONTENT.3.MD.D.8; .HSG.CO.C.10, C.11.
- *Unit 5*: CCSS.MATH.CONTENT.4.MD.A.3; 6.G.A.1; 7.G.B.4.
- *Unit 6*: CCSS.MATH.CONTENT.5.MD.C.5.B; 6.G.A.2; HSG.GMD.A.1, A.3.
- *Unit 7*: CCSS.MATH.CONTENT.6.G.A.4; HSG.GMD.A.3.
- *Unit 8*: CCSS.MATH.CONTENT.HSS.ID.A.2.
- *Unit 9*: CCSS.MATH.CONTENT.8.F.A.3; 8.G.B.8.

- *Unit 10*: CCSS.MATH.CONTENT.8.F.A.3.