Greenwich Public Schools Curriculum Overview

Algebra 1/Geometry Course 1

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 1
Full Year
022410   6 Blocks   1 Credit
Prerequisites: Teacher recommendation and a C- or below test and quiz average in 8th grade Pre-Algebra
This is the first course of a three-year sequence which integrates pre-algebra and geometry. Student experiences in the first year focus on angles, triangles, ratio and proportion, algebraic expressions and equations, an introduction to the coordinate plane, and an introduction to statistics. Throughout the course there will be an emphasis on problem solving, the use of technology, and real-world applications.

Unit Guide

- Chapter 1: Algebra and Whole Numbers
- Chapter 3: Number Theory
- Chapter 4: Rational Numbers and Fractions
- Chapter 2: Using Decimals
- Midterm Review & Midterm Exam
- Chapter 5: Basic Operations and Rational Expressions
- Chapter 6: Ratios, Proportions, and Percents
- Chapter 11: Geometry
- Chapter 7 and 10: Integers and Graphing
- Chapter 12: Data, Statistics, and Probability
- Final Review & Final Exam

Notes:

- 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.
- One day each 8-day cycle is devoted to a "lab" day. Teachers will assign topics from IXL for students to practice either old topics that they have struggled with or current topics. This is what constitutes the lab grade that is built into the grading of this course. Typically, it is easiest to set that day at the beginning of the year (i.e. every Day G is a lab day).

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:

- *Chapter 1*:
  - There is an established order of operations that must be followed to simplify expressions.
  - There can be different strategies to solve a problem, but some are more effective and efficient than others are.
  - Powers can be used to shorten the representation of repeated multiplication.
  - Algebra uses symbols to represent quantities that are unknown or that vary. Mathematical phrases and real-world relationships can be represented using symbols and operations.
- *Chapter 2*:
  - Place value can be used to compare and order numbers.
  - A percent is a ratio out of one hundred.
  - Comparing, ordering, and representing decimals visually is helpful in understanding numbers smaller than 1
  - Fractions and decimals represent a relationship between two numbers.
  - Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
- *Chapter 3*:
  - Factors are a subset of a product and with the distributive property allow options in solving polynomials.
  - All natural numbers greater than one are either prime or can be written as a unique product of prime factors (composite numbers).
  - Factors and multiples are related in ways that are similar to the way that multiplication and division are related.
  - Numbers can be expressed in scientific notation to compare very large and very small quantities and to perform computations with those numbers.
- *Chapter 4*:
  - There are an infinite number of fractions between any two fractions on the number line.
  - Equivalent fractions name the same point on a number line but have different denominators.
  - Equivalent fractions are critical when adding and subtracting fractions with unlike denominators.
  - Proper fractions, improper fractions and mixed numbers can be compared and ordered.
- *Chapter 5*:
  - To obtain a solution to an equation always involves the process of undoing the operations.
- *Chapter 6*:
  - Proportional relationships express how quantities change in relationship to each other.

- ○ Ratios and rates compare two numbers using division.
  - ○ A proportion is an equation that states that two ratios are equal.
  - ○ A percent is a ratio out of one hundred.
  - ○ Percent decreases and increases are measures of percent change, which is a relative measure based on absolute change.
- ● *Chapter 11*:
  - ○ Pythagorean Theorem can be used to find the missing side of a right triangle.
  - ○ Angles can be classified as acute, right, obtuse, or straight.
  - ○ Triangles can be named by angles and sides.
  - ○ Angle pairs are formed by intersecting lines.
- ● *Chapters 7 & 10*:
  - ○ Absolute value is a number's distance from zero.
  - ○ An integer and its opposite are the same distance from zero on a number line.
  - ○ Inequalities have more than one solution and those solutions can be represented by graphing them on a number line.
  - ○ The coordinate plane can be used to describe location in two dimensions, defined by an ordered pair.
  - ○ The operations of addition, subtraction, multiplication, and division can be applied to rational numbers, including negative numbers.
- ● *Chapter 12*:
  - ○ Statistics is necessary to make accurate decisions involving data by identifying and appropriately by utilizing measures of central tendency, and by comparing two data distributions and addressing questions about differences between populations.

Essential Questions:

- ● *Chapter 1*:
  - ○ How can we identify when to add, subtract, multiply, and divide based on the vocabulary of a word problem?
  - ○ What is an exponent, and how do we evaluate exponents?
  - ○ Is the order important when evaluating mathematical expressions?
  - ○ What is the purpose of representing numbers using letters?
  - ○ How can we evaluate a mathematical expression by replacing variables?
- ● *Chapter 2*:
  - ○ How can we identify place and place value, and how can we use place value to round decimals?
  - ○ How can we compare decimals and fractions?
  - ○ How can we convert between measurements such as Fahrenheit and Celsius?
  - ○ What is the relationship between percents and decimals?
  - ○ How can we measure the length of objects using a ruler?
- ● *Chapter 3*:
  - ○ How can we determine if a number is prime or composite?
  - ○ How can we find the GCF of a mathematical expression?
  - ○ How can we find the LCM of a mathematical expression?
  - ○ What is factoring, and how can we factor a mathematical expression?
  - ○ What is the purpose of scientific notation, and how can we write numbers in scientific notation?
- ● *Chapter 4*:
  - ○ What defines a fraction?
  - ○ What are the different ways in which we can express fractions?
  - ○ How can we compare and order fractions with both same and different denominators?
  - ○ How can we add and subtract fractions?

- *Chapter 5*:
  - How can we solve for a variable in a mathematical equation?
- *Chapter 6*:
  - How can we solve real life problems using ratios and proportions?
  - How do we find the percent of a number?
  - How do we calculate percent increase/decrease, and how does this relate to real life scenarios?
- *Chapter 11*:
  - What is an angle, and how can we identify, classify, and name them?
  - What does it mean for angles to be complementary and supplementary?
  - What is a square root, and how do we calculate square roots?
  - What is an irrational number?
  - How can we name and classify triangles?
  - Why is the Pythagorean Theorem helpful? When can we use it?
  - How can we solve for the length of the hypotenuse in a right triangle using the Pythagorean Theorem?
- *Chapters 7 & 10*:
  - What is a number line, and how can we locate points on it?
  - What does absolute value really mean?
  - How can we use a number line to graph inequalities?
  - How can we locate points on the coordinate system?
  - How can we plot points on the coordinate system?
  - How can we multiply positive and negative numbers?
- *Chapter 12*:
  - What are some useful ways to evaluate sets of data?
  - How are the measures of central tendency useful to help understand real life data?
  - How can we design and analyze a personalized survey?
  - How can we interpret real life data on a bar graph?

Resources and Assured Experiences

Textbook Information:
Pre Algebra
AGS Publishing (2006)
ISBN 9780785414513

GHS Capstone Task:
Vision of the Graduate #3 - Explore, define, and solve complex problems
- iPhone Sale - to complete after Chapter 6: Ratios, Proportions, and Percents

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

Quarterly Grading

Quarter Grades will be determined using the following components:
- Participation (includes Classwork/Lab) = 30%
- Preparation (includes Homework) = 20%

- Assessments (both Summative & Formative) = 50%

Connecticut Common Core State Standards

- *Chapter 1*: CCSS.MATH.CONTENT.7.NS.A.3; 6.EE.A.1, A.2, A.2c, B.6.
- *Chapter 2*: CCSS.MATH.CONTENT.5.NBT.A.4; 7.NS.A.2.D; 8.NS.A.1.
- *Chapter 3*: CCSS.MATH.CONTENT.8.EE.A.3, A.4; 6.NS.B.4; 4.OA.B.4.
- *Chapter 4*: CCSS.MATH.CONTENT.5.NF.A.1, 4.NF.A.2; 7.NS.A.1.
- *Chapter 5*: CCSS.MATH.CONTENT.HSA.CED.A.1; 8.EE.C.7b.
- *Chapter 6*: CCSS.MATH.CONTENT.7.RP. A.2a, A.2c, A.3; 6.RP.A.1.
- *Chapter 11*: CCSS.Math.Content.HSG-SRT.C.8; .8.G.B.7; 8.NS.A.1, A.2; 7.G.B.5; 4.G.A.1, A.2.
- *Chapters 7 & 10*: CCSS.MATH.CONTENT.7.NS.A.1b, A.1c, A.1d, A.2a; 6.NS.C.5, C.6a, C.7c, C.8; 7.EE.B.4b; 6.EE.B.8.
- *Chapter 12*: CCSS.MATH.CONTENT.HSS.ID.A.1, A.2.