



Greenwich Public Schools Curriculum Overview

Algebra 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

Full Year

022100

6 Blocks

1 Credit

Prerequisites: Teacher recommendation and a B or better Test & Quiz Average in 8th grade Pre-algebra.

This course studies linear equations and inequalities, linear functions, scatter plots and trend lines, systems of linear equations, function notation, quadratic functions, and exponential functions.

Unit Guide

- Unit 1 (Unit 2 CCSS): Linear Equations and Inequalities
- Unit 2 (Unit 4 CCSS): Linear Functions
- Unit 3 (Unit 5 CCSS): Data Analysis
- Unit 4 (Unit 6 CCSS): Systems of Linear Equations & Inequalities (some content will occur after the midterm exam)
- Midterm Review & Midterm Exam*
- Unit 5 (Unit 3 CCSS): Functions
- Unit 6 (Unit 8 CCSS): Solving & Graphing Quadratics
- Unit 7 (Unit 7 CCSS): Exponential Functions
- 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 (Unit 2 CCSS):** To obtain a solution to an equation, no matter how complex, always involves the process of undoing the operations.
 - Reason quantitatively and use units to solve problems.
 - Interpret the structure of expressions.
 - Create equations that describe numbers or relationships.
 - Understand solving equations as a process of reasoning and explain the reasoning.
 - Solve equations and inequalities in one variable.
- **Unit 2 (Unit 4 CCSS):** Linear functions are characterized by a constant average rate of change (or constant additive change).
 - Interpret functions that arise in applications in terms of the context.
 - Analyze functions using different representations.
 - Construct and compare linear and exponential models and solve problems.
 - Interpret expressions for functions in terms of the situation they model.
- **Unit 3 (Unit 5 CCSS):** Although scatter plots and trend lines may reveal a pattern, the relationship of the variables may indicate a correlation, but not causation.
 - Analyze functions using different representations.
 - Summarize, represent, and interpret data on a single count or measurement variable.
 - Summarize, represent, and interpret data on two categorical and quantitative variables.
 - Interpret linear models.
- **Unit 4 (Unit 6 CCSS):** A system of linear equations is an algebraic way to compare two equations that model a situation and find the breakeven point or choose the most efficient or economical plan.
 - Create equations that describe numbers or relationships.
 - Solve systems of equations.
 - Represent and solve equations and inequalities graphically.
- **Unit 5 (Unit 3 CCSS):** Functions are a mathematical way to describe relationships between two quantities that vary.
 - Create equations that describe numbers or relationships.
 - Represent and solve equations and inequalities graphically.
 - Understand the concept of a function and use function notation.
 - Interpret functions that arise in applications in terms of the context.
 - Analyze functions using different representations.
- **Unit 6 (Unit 8 CCSS):**
 - Many real-world situations can be modeled with quadratic functions.
 - How and why quadratic equations are used.
 - How to determine which method of solving is best to use given the situation.
- **Unit 7 (Unit 7 CCSS):**
 - When comparing an exponential model with a linear model, the question is not *if* the exponential model will generate very large or very small inputs, but rather *when*.
 - With real data, sometimes deciding whether data is linear or non-linear is more complex than just looking at a graph, differences ($y_n - y_{n-1}$), or an r-value; it is important to examine differences that are approximately the same more carefully to

see if there is a pattern of increasing or decreasing values that, because the pattern is exponential, soon begins to produce outputs of remarkable values.

Essential Questions:

Unit 1 (Unit 2 CCSS):

- What is an expression?
- What is an equation?
- What does equality mean?
- What is an inequality?
- How can we use linear equations and linear inequalities to solve real world problems?
- What is a solution set for a linear equation or linear inequality?
- How can models and technology aid in the solving of linear equations and linear inequalities?
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Unit 2 (Unit 4 CCSS):

- What is a linear function?
- What are the different ways that linear functions may be represented?
- What is the significance of a linear function's slope and y-intercept?
- How may linear functions model real world situations?
- How may linear functions help us analyze real world situations and solve practical problems?

Unit 3 (Unit 5 CCSS):

- How do we make predictions and informed decisions based on current numerical information?
- What are the advantages and disadvantages of analyzing data by hand versus by using technology?
- What is the potential impact of making a decision from data that contains one or more outliers?

Unit 4 (Unit 6 CCSS):

- What does the number of solutions (none, one or infinite) of a system of linear equations represent?
- What are the advantages and disadvantages of solving a system of linear equations graphically versus algebraically?

Unit 5 (Unit 3 CCSS):

- What is a function?
- What are the different ways that functions may be represented?
- How can functions be used to model real world situations, make predictions, and solve problems?

Unit 6 (Unit 8 CCSS):

- How are quadratic equations used in the real world?
- What are the different ways to solve quadratic equations and when is each appropriate?
- What features distinguish the graph of a quadratic function from other graphs?
- How can an understanding of polynomials help in understanding quadratic functions and equations?
- What are the advantages and disadvantages of different forms of the quadratic function and different methods for solving quadratic equations?

Unit 7 (Unit 7 CCSS):

- What characterizes exponential growth and decay?
- What are real world models of exponential growth and decay?
- What are the limitations of exponential growth models?
- How can one differentiate an exponential model from a linear model given a real world data set?

Resources and Assured Experiences

Textbook Information:

Algebra 1 with Calc Chat and Calc View
Ron Larson and Laurie Boswell
Big Ideas Learning (2022)
ISBN 13: 978-1-64727-417-7

GHS Capstone Task:

[Vision of the Graduate](#) #3 - Explore, define, and solve complex problems

- Choosing a Gym - to complete after Unit 6: Systems of Linear Equations & Inequalities

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) = 10%
- Preparation (includes Homework) = 10%
- Assessments (both Summative & Formative) = 80%

Connecticut Common Core State Standards

- *Unit 2:* CCSS.Math.Content.HSN-Q.A.1, A.2, A.3; HSA-CED.A.1, A.4; HSA-REI.A.1, B.3; HSA-SSE.A.1a, A.1b, B.3a, B.3b, B.3c; 8.EE.C.7a, C.7b.
- *Unit 3:* CCSS.Math.Content.8.F.A.1, B.5; HSF-IF.A.1, A.2, B.4, B.5, C.7b, C.9; HSN.VM.C.8, C.9.
- *Unit 4:* CCSS.Math.Content.HSF-IF.B.6, C.7a, C.8b; HSF-LE.A.1a, A.1b, B.5.
- *Unit 5:* CCSS.Math.Content.HSS-ID.A.2, A.3, B.6a, B.6b, A.6c, C.7, C.8, C.9; 8.SP.A.1, A.2, A.3.
- *Unit 6:* CCSS.Math.Content.HSA-REI.C.5, C.6, D.11; HSA-CED.A.3.
- *Unit 7:* CCSS.Math.Content.HSN-RN.A.1, A.2; HSF-LE.A.1a, A.1b, A.1cA.3, B.5; HSA-SSE.A.1b, B.3c; HSF-IF.C.7a, C.7b, C.7c, C.7d, C.7e.
- *Unit 8:* CCSS.Math.Content.HSF-IF.B.4, C.7a, C.8a; HSA-APR.A.1; HSA-APR.A.1, HSA-SSE.B.3a, B.3b, B.3c; HSA-REI.B.4a, B.4b.