



Greenwich Public Schools Curriculum Overview

Algebra 2B

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 2B

Full Year

022300

6 Blocks

1 Credit

Prerequisite: Geometry B or Algebra 1/Geometry Course 3 with teacher recommendation.

This course covers the core topics of Algebra 2A with emphasis placed on mastery of basic Algebra 2 skills. This course does not meet the prerequisite for Precalculus 1.

Unit Guide

Unit 1: Functions/Linear Functions

Unit 2: Systems of Linear Equations and Inequalities

Unit 3: Polynomial/Quadratic Functions

Unit 4: Data Analysis and Statistics

Midterm Review & Midterm Exam*

Unit 5: Counting Methods and Probability

Unit 6: Exponential and Logarithmic Functions

Unit 7: Rational Exponents and Radicals

Unit 8: Rational Expressions and Equations

Unit 9: Patterns

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.
- Look for and express regularity in repeated reasoning.

Enduring Understandings:

- *Unit 1:* Functions help to model, analyze and predict situations.
- *Unit 2:* 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.
- *Unit 3:* To analyze the structure of polynomial equations and their real life applications, we must extend the known rules of functions.
- *Unit 4:* Data interpretations help develop informed decisions and predictions.
- *Unit 5:* Probability can be used to determine the outcome of decisions.
- *Unit 6:* Exponential functions model growth and/or decay phenomenon.
- *Unit 7 & 8:* To analyze the structure of rational expressions, we must extend the known rules of functions.
- *Unit 9:* Analyzing patterns and writing explicit rules (algebraic and geometric) provide a powerful way to extend patterns and make predictions.

Essential Questions:

Unit 1:

- How do you determine if a relation is a function?
- How do you evaluate a function?
- How do you find the domain of a function?
- How can the vertical line test be used to determine if a graph is a function?
- How do you obtain information from or about the graph of a function?
- How do you find and use the slope of a line?
- When and how is it beneficial to graph lines using slope-intercept form?
- When and how is it beneficial to graph lines using standard form?
- How do you graph vertical and horizontal lines?
- How do you determine when to use the point-slope form of a line?
- How do you determine the differences between parallel and perpendicular lines?
- How do you write the equation of a line that is parallel or perpendicular to a given line and passes through a given point?
- How may linear functions model real world situations?
- How may linear functions help us analyze real world situations and practical problems?

Unit 2:

- What does the number of solutions (none, one or infinite) of a system of linear equations represent?
- How do we graph a linear inequality on the number line?

Unit 3:

- What is a quadratic function?
- What properties / characteristics of quadratic functions are necessary in order to analyze and graph?
- What are the advantages / disadvantages in having a quadratic function written in standard form? Vertex form? Intercept form?
- How does factoring assist in finding the zeros (roots / intercepts) of a quadratic function?
- How can quadratic functions model real world applications?
- What strategies do we have for identifying real and complex roots?
- How can we solve equations with complex and real roots?
- How is the quadratic formula used to solve quadratic equations?
- How does the discriminant test assist in determining the nature of a quadratic function's roots?
- How do you perform operations with polynomial functions?

Unit 4:

- How do you describe data using statistical measures?

- How can the normal curve be used to approximate probability
- What does it mean for data to be skewed?
- How do you develop different sampling methods for collecting data?
- How can you identify flaws in survey questions and experiments?

Unit 5:

- How can you use the fundamental counting principle and permutations to calculate the number of choices for a situation?
- How can you use combinations to calculate the number of choices for a situation?
- How can you determine the likelihood that an event will occur?
- How do you find the probability of compound events?
- How do you establish whether events are dependent or independent?
- How do you compute the probability of two events when the occurrence of one affects the probability of the other?

Unit 6:

- What does the graph of an exponential growth/decay model look like?
- How can exponential growth/decay models reflect real world applications?
- How does base e relate to exponential growth and decay?
- What is the relationship between logarithmic and exponential functions?
- What does the graph of a logarithmic function look like?
- How do you use the properties of logarithms to rewrite expressions?
- How do you solve exponential and logarithmic equations?

Unit 7:

- What is the relationship between n th roots and rational exponents?
- How are the properties of rational functions related to the properties of integer exponents?
- How do you solve radical equations?
- What operations can be performed on a pair of functions to obtain a third function?
- How do you find the inverse relation of a given function?

Unit 8:

- How do you multiply and divide rational expressions?
- How do you add and subtract rational expressions?
- How do you solve rational equations?

Unit 9:

- What is a sequence?
- What is a series?
- How do you determine if a sequence is arithmetic?
- How do you find the sum of a finite arithmetic series?
- How do you determine if a sequence is geometric?
- How do you find the sum of a finite geometric series?
- How do you find the sum of an infinite geometric series?
- How do sequences and series (both arithmetic and geometric) model real world applications?

Resources and Assured Experiences

Textbook Information:

Algebra 2 (2022 Edition)
Big Ideas Learning LLC
ISBN 978-1-64727-421-4

GHS Capstone Task:

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

- Lily's CDM Savings Account - to complete after Unit 6: Exponential and Logarithmic Functions

Extra Resources:

- [Big Ideas 2022 AGA curriculum suite](#)
- [Arlington Algebra Project](#)
- [Connecticut Core Standards - Mathematics Teaching Materials](#)

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.HSF.IF.A.1, A.2, B.4, B.5, B.6, C.7; HSF.BF.A.1, B.3.
- *Unit 2:* CCSS.MATH.CONTENT.HSA.REI.C.5, C.6, C.7; HSA.CED.A.1.
- *Unit 3:* CCSS.MATH.CONTENT.HSA.APR.A.1; HSF.IF.B.4, C.7, C.8, C.9; HSA.SSE.A.2; HSA.APR.B.3; HSA.REI.B.4, B.4b; HSA.CED.A.1, A.2; HSN.CN.A.1, A.2.
- *Unit 4:* CCSS.MATH.CONTENT.HSS.ID.A.4; HSS.IC.B.3; 6.SP.B.5, B.5c.
- *Unit 5:* CCSS.MATH.CONTENT.HSS.MD.B.6, B.7; HSS.CP.A.1, A.2, A.3, A.4, A.5, B.6, B.7, B.8, B.9.
- *Unit 6:* CCSS.MATH.CONTENT.HSA.CED.A.1; HSF.IF.B.4, B.5, C.7, C.7a, C.7b, C.7c, C.7d, C.7e, C.9; HSF.LE.A.4.
- *Unit 7:* CCSS.MATH.CONTENT.HSA.REI.A.2; HSF.BF.B.3, B.4; HSN.RN.A.2; HSF.IF.B.4, B.5.
- *Unit 8:* CCSS.MATH.CONTENT.HSA.APR.D.6, D.7; HSA.REI.A.2; HSF.BF.B.3, B.4.
- *Unit 9:* CCSS.MATH.CONTENT.HSF.BF.A.1, A.1a, A.2; HSA.SSE.B.4.