

**GHS Curriculum Map
Math
Grades 9-12**

Subject/Course Title: Algebra 2

Unit Title: Extending Algebra 1 Concepts (Unit 1)

Unit Overview

This unit begins with a review of previously learned concepts and skills including solving linear equations and inequalities, slope and linear relationships, writing and solving systems of linear equations to model real life scenarios using the substitution/elimination/graphing methods, and function notation as it is used to express relationships between the independent and dependent variables. Students then extend their basic knowledge to solve compound inequalities, absolute value equations/inequalities, and graph piecewise functions. The graphs of absolute value equations and inequalities will be discussed using the graphing calculator as a tool. In addition to using the graphing calculator to view linear systems, students will learn how to use a feature of the calculator to determine the point of intersection. Students will use a three-point approach to solving and checking problems (algebraic, numeric, and graphic) by using the graphing calculator.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments	Key Resources/Texts
5 weeks	CT Core Standards 8EE 7. a, b A-SSE 1. a A.APR.1 A-CED 1 A-CED 4 A-REI 1 A-REI 3 N-Q 1 N-Q 2 N-Q 3 F.IF.A.2 8EE 8.a-c A-CED 3 A-REI 5 A-REI 6 A-REI 11	<ol style="list-style-type: none"> 1. What is a function and how can one be identified and represented? 2. What is functional notation and how does it represent the relationship between input and output variables? 3. How can real-world problems be modeled and solved using equations, inequalities and absolute value? 4. What is the meaning and purpose of the solutions for a system of equations? 	<ul style="list-style-type: none"> • Student-owned learning. • Teacher facilitated review using cooperative student grouping. • Inquiry based learning. • Teacher modeling of skills/concepts. • Homework and practice. 	<ul style="list-style-type: none"> • Summer Work Assessment • Piecewise and Absolute Value Functions Assessment • Compound Inequalities Assessment • Systems Assessment 	McDougal Littell <i>Algebra 2</i> Textbook Khan Academy TI83/84 Reference Sheet Kutasoftware Math Sheet Generator for Teachers

Subject/Course Title: Algebra 2

Unit Title: Quadratics (Unit 2)

Unit Overview

In this unit students are introduced to the quadratic function and the features of its parabolic graph. Students will continue using a graphing calculator to explore the characteristics of the function. They will draw connections between the roots of the function and the x-intercepts, as well as identify the vertex of the parabola as a maximum/minimum value of the function. Students will learn three different methods to solve quadratics. Complex numbers are introduced and used to express solutions to quadratics with imaginary roots. Applications such as projectile motion, free falling objects and maximum/minimum values are embedded in the unit.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
12 weeks	CT Core Standards A.SSE.3 A.SSE.3a A.SSE.3b A.REI.A.2 A.REI.4 A.REI.4b A.REI.11b BF.A.1 CED.A.1 CED.A.2 F.IF.B.4 F.IF.C.7 F.IF.C.7a F.IF.C.7b N.CN.1 N.CN.2 N.CN.7 N.CN.9 (+) N.RN.3	<ol style="list-style-type: none">How do you use quadratic functions to model situations and solve problems?How are quadratic functions used to analyze and interpret mathematical relationships?	<ul style="list-style-type: none">Grouping students to work on learning targets.Teacher modeling of problem solving.Integrate technology for discovery and practice.Inquiry based learning.Homework and practice.	<ul style="list-style-type: none">Graphing Quadratics in all three forms, Converting to Standard Form, Factoring Quadratics and Solve by FactoringSimplifying RadicalsSolving by taking the square rootComplex NumbersCompleting the Square and Quadratic Formula and DiscriminantGraphing Quadratic Inequalities (Systems) and Writing Quadratic Equations given a graph	McDougal Littell <i>Algebra 2</i> Textbook Khan Academy TI83/84 Reference Sheet Kutasoftware Math Sheet Generator for Teachers Desmos

Subject/Course Title: Algebra 2

Unit Title: Polynomial Functions (Unit 3)

Unit Overview

In this unit students extend their prior knowledge about polynomials to learn about polynomial functions. Students will use the properties of exponents to evaluate numerical expressions and simplify algebraic expressions. Students begin by defining and identifying polynomial functions by their equation and graphical representation. Students perform operations on polynomials and learn how to divide polynomials using synthetic division. Several theorems about the roots of polynomial equations are studied including the Fundamental Theorem of Algebra. The second portion of the unit provides students an opportunity to practice skills learned using function operations and function compositions. Finally, students use inverse function relations in order to solve real-world problems.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
9 weeks	CT Core Standards F.IF.7c F.IF.7 F.IF.4 A.APR.1 A.APR.2 A.APR.3 A.SSE.2 A.APR.4 A.CED.2 F.IF.9 F.LE.3	<ol style="list-style-type: none">1. How do polynomial functions model real-world problems and their solutions?2. How can we extend our understanding of x-intercepts to encompass the determination of all zeros?3. How does graphing an equation allow you to draw conclusions?	<ul style="list-style-type: none">• Grouping students to work on learning targets.• Teacher modeling of problem solving.• Integrate technology for discovery and practice.• Inquiry based learning.• Homework and practice.	<ul style="list-style-type: none">• Properties of exponents and evaluating & graphing polynomial functions.• Polynomial operations & factoring and solving polynomial equations.• Remainder and factor theorems & finding zeros.• Analyzing graphs of polynomial functions and modeling with polynomial functions.	McDougal Littell <i>Algebra 2</i> Textbook Khan Academy TI83/84 Reference Sheet Kutasoftware Math Sheet Generator for Teachers Desmos

Subject/Course Title: Algebra 2

Unit Title: Powers, Roots, and Radicals (Unit 4)

Unit Overview

In this unit students will learn how to evaluate n th roots of real numbers using both radical and exponential notation. They will use properties of rational exponents to evaluate and simplify expressions, and they will evaluate power functions and perform arithmetic operations with functions as well as composition of functions. They will find inverses of functions and graph square root and cube root functions. Students will solve equations that have radicals or rational exponents. They will use roots, rational exponents, power functions, function operations, and radical equations to solve real life problems.

Time Frame	Priority Standards	Essential Questions	Instructional Strategies	Assessments (Note Writing Tasks and Performance Tasks)	Key Resources/Texts
8 weeks	CT Core Standards A.SSE.2 A.CED.4 A.REI.2 F.IF.7.b F.IF.8 F.BF.1.b F.BF.4.a	<ol style="list-style-type: none">1. What is the relationship between a radical expression and an expression with a rational exponent?2. How do the rules for performing operations on radical expressions relate to the rules for operating with rational expressions?3. How are radicals and numbers written with rational exponents used in our everyday lives?	<ul style="list-style-type: none">• Grouping students to work on learning targets.• Teacher modeling of problem solving.• Integrate technology for discovery and practice.• Inquiry based learning.• Homework and practice.	<ul style="list-style-type: none">• nth Roots and Rational Exponents and Properties of Rational Exponents• Power Functions, Function Operations, and Inverse Functions• Graphing Square Root and Cube Root Functions and Solving Radical Equations	McDougal Littell <i>Algebra 2</i> Textbook Khan Academy TI83/84 Reference Sheet Kutasoftware Math Sheet Generator for Teachers Desmos