

Algebra 2 Curriculum Map

ALGEBRA 2 UNITS

Overview:	Suggested Pacing
Unit 1 - Basic Equations	12 Days
Unit 2 - Linear Functions	12 Days
Unit 3 - Linear Systems	12 Days
Unit 4 - Matrices	12 Days
Unit 5 - Quadratics	12 Days
Unit 6 - Polynomial Functions	12 Days
Unit 7 - Roots & Radicals	12 Days
Unit 8 - Exponential & Logarithmic Functions.	12 Days
Unit 9 - Rational Functions.	11 Days
Unit 10 - Quadratic Relations.	11 Days
Unit 11 - Trigonometry	12 Days
Unit 12 - Using Trigonometry	12 Days
Unit 13 - Sequences & Series	11 Days
Unit 14 - Probability & Statistics.	11 Days
Total:	164 Days

Unit 2 Linear Functions (12 Days)

- 2.1 Relations & Functions
- 2.2 Relations and Functions (1.5 days)
- 2.3 Linear Functions (1.5 days)
- 2.4 Writing Equations of Lines (1.5 days)
- 2.5 Linear Models (1.5 days)
- 2.6 Absolute Value Functions (1.5 days)
- 2.7 Graphing Inequalities
- 2.8 Piecewise Functions
- Review
- Test

Unit 3 Linear Systems (12 Days)

- 3.1 Solving Systems by Graphing
- 3.2 Solving Systems Algebraically (3 Days)
- 3.3 Systems of Inequalities (1.5 days)
- 3.4 Linear Programming (1.5 days)
- 3.5 Linear Systems with Three Variables (2 Days)
- Review
- Test

Unit 4 Matrices (12 Days)

- 4.1 Data Organization with Matrices
- 4.2 Matrix Addition
- 4.3 Matrix Multiplication (1.5 Days)
- 4.4 Transformations with Matrices (1.5 Days)
- 4.5 Determinants (1.5 Days)
- 4.6 Inverses of Matrices (1.5 Days)
- Optional Activity: Matrix Coding Activity
- 4.7 Solving Systems with Matrices
- Review
- Test

Unit 5 Quadratics (12 Days)

- 5.1 Graphing Quadratic Functions (1.5 days)
- 5.2 Solving Quadratic Equations by Factoring(1.5 days)
- 5.3 Solving Quadratic Equations using Roots
- 5.4 Complex Numbers
- Optional Activity: Complex Numbers & Mandelbrot Set
- 5.5 Completing the Square
- 5.5 The Quadratic Formula
- 5.6 Quadratic Inequalities
- 5.7 Quadratic Models
- Review
- Test

Unit Breakdowns with Suggested Pacing

Unit 1 Basic Equations (12 Days)

- 1.1 Introduction to Complex Numbers
- 1.2 Algebraic Expressions (1.5 days)
- 1.3 Linear Equations (1.5 days)
- 1.4 Linear Inequalities
- 1.5 Absolute Value Equations (2 days)
- 1.6 Compound Inequalities (1.5 days)
- 1.7 Absolute Value Inequalities (1.5 days)
- Review
- Test

Unit 6 Polynomial Functions (12 Days)

- 6.1 Identifying Functions
- 6.2 Dividing Polynomials
- 6.3 Factoring Polynomials (1.5 days)
- 6.4 Solving Polynomial Equations (1.5 days)
 - Optional Activity: Polynomial Function End Behavior
- 6.5 Interpreting Polynomial Functions
- 6.6 Graphing Polynomial Functions (2 days)
- 6.7 Modeling Polynomial Functions
 - Review
 - Test

Unit 7 Roots & Radicals (12 Days)

- 7.1 Forms of Radicals (1.5 days)
- 7.2 Properties of Rational Exponents (1.5 days)
- 7.3 Radical Operations (1.5 days)
- 7.4 Radical Equations (1.5 days)
- 7.5 Function Operations
 - Optional Activity: Inverse Functions Activity
- 7.6 Inverse Functions
- 7.7 Radical Functions
 - Review
 - Test

Unit 8 Exponential & Logarithmic Functions (12 Days)

- 8.1 Exponential Functions (1.5 days)
- 8.2 Exponential Models (1.5 days)
- 8.3 Common Logarithms
- 8.4 Properties of Logarithms
- 8.5 Natural Logarithms
- 8.6 Exponential & Logarithmic Equations (2 days)
 - Optional: Forensic Science Activity
- 8.7 Exponential & Logarithmic Functions
 - Review
 - Test

Unit 9 Rational Functions (11 Days)

- 9.1 Simplifying Complex Fractions (2 days)
- 9.2 Rational Equations (2 days)
- 9.3 Inverse Variations
- 9.4 Graphing Inverse Variations
 - Optional: Discontinuous Functions Activity
- 9.5 Rational Functions
 - Review
 - Test

Unit 10 Conic Sections/Quadratic Relations (11 Days)

- 10.1 Parabolas (2 days)
- 10.2 Circles
- 10.3 Ellipses (2 days)
- 10.4 Hyperbolas (2 days)
 - Optional: Discontinuous Functions Activity
- 10.5 Classifying Conics
 - Review
 - Test

Unit 11 Trigonometry (12 Days)

- 11.1 Trig Ratios
- 11.2 Solving Right Triangles
- 11.3 Trig in a Cartesian Plane (2 Days)
- 11.4 Sine & Cosine Functions (2 days)
 - Optional Activity: Cosecant and Secant Graphing
- 11.5 Tangent & Cotangent Functions
- 11.6 Translating Trig Functions (2 days)
 - Review
 - Test

Unit 12 Using Trigonometry (12 Days)

- 12.1 Area & the Law of Sines (2 days)
 - Optional Activity: Law of Sines Ambiguous Case Activity
- 12.2 The Law of Cosines
- 12.3 Basic Trig Identities
- 12.4 Simplifying Trig Expressions (2 days)
- 12.5 Basic Trig Equations
- 12.6 Trig Equations with Different Periods (2 days)
 - Review
 - Test

Unit 13 Sequences & Series (11 Days)

- 13.1 Mathematical Patterns
- 13.2 Arithmetic Sequences
- 13.3 Arithmetic Series & Sigma Notation (2 Days)
- 13.4 Geometric Sequences
- 13.5 Geometric Series & Sigma Notation (2 Days)
- 13.6 Mathematical Induction
- 13.7 Area Under a Curve
 - Review
 - Test

Unit 14 Probability & Statistics (11 Days)

- 14.1 Counting Principles & Permutations
- 14.2 Combinations & Binomial Theorem (1.5 Days)
- 14.3 Basic Probability (1.5 Days)
- 14.4 Probability of Compound Events
- 14.5 Standard Deviation
- 14.6 Binomial Distributions (2 days)
- 14.7 Normal Distributions
 - Review
 - Test

	Pacing Guide	CCSS Addressed	Core Skills	Key Vocabulary
Unit 1: Basic Equations	12 Days	HSA-REI.B.3; HSA-REI.A.1; HSA-CED.A.4; HSA-CED.A.1; HSA-APR.A.1; HSA-SSE.B.3; HSN-RN.B.3; 8.NS.A.2; 8.NS.A.1	Simplifying Exponents; Literal Equations; Solve and Graph Linear; Solve and Graph Linear Inequalities; Find the midpoint; Solve and Write Absolute Value Equations and Inequalities; Solve and Graph Compound Inequalities	Real & Complex Numbers; Properties: Commutative, Associative, Identity, Inverse, Closure, Product property of Exponents, Power property of exponents, Zero Exponent, Quotient property of exponents; Negative exponents; Extraneous Values; Distance; Midpoint; Conjunction; Disjunction
Unit 2: Linear Functions	12 Days	HSS-ID.B.6; HSF-LE.A.2; HSF-IF.C.7D; HSF-IF.C.7B; HSF-IF.A.2; HSF-IF.A.1; HSA-REI.D.12; HSA-REI.D.10; HSA-CED.A.2;	Graph Relations; Identify Functions; Find slope; Graph linear functions; Write equation of lines (including parallel & perpendicular); Model real-world data; Make predictions from linear data; Translate absolute value functions; Graph linear and absolute value inequalities; Graph and write piecewise functions	Abscissa & Ordinate; Domain & Range; Relation; Function; X & Y intercepts; Slope; Standard Form; Slope-Intercept Form; Point-Slope Form; Parallel & Perpendicular Lines; Scatterplot; Trend Line; Linear Regression; Interpolation; Extrapolation; Piecewise & Step Functions
Unit 3: Linear Systems	12 Days	HSA-REI.D.12; HSA-REI.D.11; HSA-CED.A.2; HSA-REI.C.6; HSA-REI.C.7	Analyze solutions of linear systems; Solve linear systems by graphing, substitution & elimination; Algebraically solve consistent, inconsistent & dependent systems; Solve real-world problems with linear systems; Solve & write systems of linear inequalities; Plot points in three dimensions; Determine octant of points in space; Graph plane of a function; solve linear systems with three variables	Systems of linear equations; Consistent; Independent; Dependent; Inconsistent; Linear Programming; Constraint inequalities; Objective function; Feasible region; Coordinate space; Ordered triple; Octants
Unit 4: Matrices	12 Days	HSA-REI.C.9; HSN-VM.C.12; HSN-VM.C.11; HSN-VM.C.10; HSN-VM.C.9; HSN-VM.C.8; HSN-VM.C.7; HSN-VM.C.6	Identify matrices and elements; Organize data with matrices; Add, subtract, multiply matrices; Scalar multiplication; Verify and find inverse matrices; Translation, dilation, reflection, rotation matrices; Find determinants; Solve matrix equations; Solve systems using Cramer's rule; Use matrices to find area; Solve matrix equations using minors; Solve augmented matrices	Matrix; Elements; Scalar Multiplication; Identity matrix; Transformation; Translation; Dilation; Reflection; Rotation; Determinant; Cramer's rule; Matrix area formula; Inverse matrix; Laplace expansion (minors); Augmented matrix; Row operations
Unit 5: Quadratics	12 Days	HSF-IF.C.9; HSF-IF.C.8a; HSF-IF.C.7c; HSF-IF.C.7a; HSF-IF.B.4; HSA-REI.D.12; HSA-REI.B.4b; HSA-REI.B.4a; HSA-REI.B.4; HSN-CN.B4; HSN-CN.A.2; HSN-CN.A.1	Identify linear, quadratic & polynomial equations; Determine quadratic function max/min, vertex coordinates, axis of symmetry & relative width of a parabola; Graph quadratic functions using standard, vertex, intercept, & factored form; Solve quadratic equations using roots; Rationalize the denominator; $+x /$ & graph complex numbers; Find the absolute value of complex numbers; Complete the square; Use quadratic formula; Evaluate quadratics using discriminant; Write quadratic equations & functions; Graph & solve quadratic inequalities; Solve quadratic inequalities in two variables	Equations & Functions; Parabola; Maximum; Minimum; Axis of Symmetry; Translation; Standard form of a quadratic; Vertex form of a quadratic; Intercept form of a quadratic; Zeros; Rationalizing the denominator; Square root property; Complex numbers; The pattern of multiples of i ; The Mandelbrot Set; Fractal; Completing the square; The discriminant; Complex conjugates; Critical x-values; Quadratic regression

	Pacing Guide	CCSS Addressed	Core Skills	Key Vocabulary
Unit 6: Polynomial Functions	12 Days	HSA-SSE.B.3; HSA-APR.A.1; HSA-APR.B.2; HSA-APR.B.3; HSA-APR.C5; HSA-APR.D.6; HSA-APR.D.7; HSA-REI.A.1; HSF-IF.C.7c; HSF-IF.C.8; HSS-ID.B.6a	Classify polynomials by degree & # of terms; Place polynomials into standard form; Divide a polynomial by a monomial, binomial, using synthetic division; Factor sum & difference of two cubes; Completely factor and solve polynomial equations; Write polynomial equations from solutions or zeros; Determine function end behavior; Determine the relative extrema; Graph and model polynomial functions	Monomial, binomial, trinomial, polynomial; Leading coefficient; Standard form of a polynomial; Cubic, quartic, quintic; Synthetic substitution; Synthetic division; Sum and difference of two cubes; Remainder theorem; Factor theorem; Rational, Irrational and Complex Root theorems; Fundamental theorem of algebra; End behavior; Zeros of polynomial functions; Extrema; Cubic function model; Finite differences
Unit 7: Roots and Radicals	12 Days	HSF-BF.B.4c; HSF-BF.B.4b; HSF-BF.A.1c; HSA-REI.A.2; HSN-RN.A.2; HSN-RN.A.1	Simplifying radicals; Change between radical form and exponent form; Add, subtract, multiply & divide radicals and functions; Heron's area formula; Compound interest formula; Solve and graph radical & exponential equations; Extraneous solutions to radical equations; Composition of functions; Find and graph inverse of a function; Verify inverse functions using composition	Root, radical, radicand, index; Principal root; Compound interest; Heron's area formula; Composition of functions; Inverse functions; Decomposing functions; One-to-one correspondence; Radical Function
Unit 8: Exponential and Logarithmic Functions	12 Days	HSF-LE.A.1c; HSF-BF.B.5; HSF-IF.C.8; HSF-IF.C.7e; HSA-CED.A.2	Graph, translate & analyze exponential functions; Solve exponential, log, and growth & decay problems; Convert between exponent & log form; Evaluate common & natural logs; Expand & condense expressions using log properties; Change log bases; Solve continuous compounding problems; Graph log functions; Solve & graph logistic growth problems	Asymptote; Horizontal expansion/compression; Horizontal & vertical shift; Growth factor; Initial amount; Growth/decay; Half-life; Depreciation; Common and natural logarithm; Continuous compounding; Logistic growth function; Point of inflection
Unit 9: Rational Functions	11 Days	HSF-BF.A.1; HSF-IF.C.7d; HSA-REI.D.11; HSA-REI.A.2; HSA-CED.A.1; HSA-APR.D.7; HSA-SSE.B.3a; HSA-SSE.B.3	Simplify complex fractions; Find harmonic mean; Determine extraneous values; Solve rational equations; Solve work problems; Differentiate between direct & inverse variation; Solve inverse variation problems; Solve combined variation problems; Translate and graph inverse variations; Identify properties of rational functions; Graph rational functions	Complex fraction; Harmonic mean; Extraneous values; Excluded values; Direct variation; Inverse variation; Constant of proportionality; Joint variation; Combined variation; Hyperbola; Branches; Asymptotes; Continuous function; Discontinuous function; Removable discontinuity; Jump discontinuity; Infinite discontinuity; Endpoint discontinuity; Mixed discontinuity
Unit 10: Conic Sections/ Quadratic Relations	11 Days	HSG-GPE.A.3; HSG-GPE.A.2; HSG-GPE.A.1	Analyze and graph parabolas, circles, ellipses & hyperbolas; Find the eccentricity; Solve systems of conic sections; Use the determinant to classify conics; Write the equation of parabolas, circles, ellipses & hyperbolas	Conic section; Parabola; Focus; Directrix; Circle; Internal region; External region; Tangent line; Ellipse; Major axis; Minor axis; Co-vertices; Eccentricity; Hyperbola; Transverse axis; Asymptotes; General second-degree equation; Discriminant

	Pacing Guide	CCSS Addressed	Core Skills	Key Vocabulary
Unit 11: Periodic Functions & Trigonometry	12 Days	HSF-IF.C.7e; HSF-TF.A.1; SHF-TF.A.2; HSF-TF.A.3; HSG-SRT.C.6; HSG-SRT.C.7; HSG-SRT.C.8	Find sin, cos, tan, csc, sec & cot ratios; Find angle given trig ratio; Solve right triangles; Find exact value of 45 & 30 degree angles and multiples; Find trig ratios in a cartesian plane; Convert between radians & degrees; Find length of an arc; Find area of circle's sector; Find angle measures and sin, cos & tan using unit circle; Determine the amplitude, period, horizontal and vertical shift of a trig function; Graph the sine, cosine and tangent functions	Sine, Cosine, Tangent, Cosecant, Secant & Cotangent functions; Reciprocal trig functions; 45-45-90 and 30-60-90 triangles; Trig ratios in a cartesian plane; Radians; Arc length; Unit circle; Area of a sector; Amplitude; Period; Horizontal & vertical shifts; Periodic function; Basic sine, cosine and tangent waves and their translation
Unit 12: Using Trigonometric Identities	12 Days	HSG-SRT.C.7; HSG-SRT.D.9; HSG-SRT.D.10; HSG-SRT.D.11; HSF-TF.C.9; HSF-TF.B.6; HSF-TF.A.2	Find area of oblique triangles; Use law of sines to solve oblique triangles; Solve the ambiguous case; Verify trig identities; Simplify trig expressions; Solve trig equations for a given domain if $b = 1$ or $b \neq 1$; Solve trig equations for all solutions if $b = 1$ or $b \neq 1$	Law of Sines; Area formula for oblique triangles; The ambiguous case; Law of cosines; Pythagorean identities; Tangent & cotangent identities; Cofunction, negative angle, and reciprocal identities; Restricted domain; Period of sin, cos & tan functions
Unit 13: Sequences & Series	11 Days	HSA-SSE.B.4; HSF-IF.A.3; HSF-BF.A.2	Find a sequence's next and nth term; Write recursive & explicit formulas for arithmetic or geometric sequences & identify its graph; Distinguish between a geom. & arithm. sequence; Find the arithm. & geom. mean; Find partial sum of a sequence; Evaluate sigma notation; Infinite sum of convergent sequences; Estimate area under a curve	Infinite & finite sequence; Recursive & explicit formula; Common difference; Arithmetic mean; Series; Partial sum formula for an arithmetic and geometric sequence; Sigma notation; Properties of summation; Common ratio; Geometric mean; Divergent and convergent infinite geometric sequence; Summation formula for a convergent sequence; Mathematical induction; Inscribed and circumscribed rectangles under a curve
Unit 14: Probability & Statistics	11 Days	HSS-ID.A.4; HSS-CP.A.2; HSS-CP.B.8; HSS-CP.B.9	Determine the number of ways an event can occur; Solve permutation and combination problems; Find terms of binomial expansion; Find theoretical, experimental, geometric and binomial probabilities; Find the probability of compound, independent and dependent events; Find probability of an event's complement; Find mean, median, mode, variance, standard deviation, and z-score for a set of values; Solve normal distribution problems	Fundamental counting principle; Factorial; Permutation; Combination; Pascal's triangle; Binomial expansion theorem; Theoretical, independent, dependent, & binomial probability; Experimental, Geometric, and Probability of compound events; Complement of an event; Measures of central tendency; Mean, median and mode; Mean deviation; Variance; Standard deviation; Z-score; Binomial distributions; The empirical rule