Algebra I

Algebra is a study of how the world can be modeled and interpreted by first quantifying it mathematically. To be able to communicate meaning effectively and form connections between concepts there is a need for proficient variable manipulation. Algebra I will develop skills in students to help them solve real world problems with a focus on:

UNITS:

- Math & Expressions
- Solving Equations
- Solving Inequalities
- Writing Equations and Function Notation
- Graphing in 2 Variables
- Systems of Equations
- Polynomials and Exponents
- Factoring
- Data and Probability
- Radical Expressions and Equations

Unit 1

Content: Math and Expressions

Duration: 4 weeks

Essential Question:

How can we show that algebraic properties and processes are extensions of arithmetic properties and processes, and how can we use algebraic properties and processes to solve problems?

Skills:	Apply the Order of Operations (1-2)
	Simplifying Radicals (Supplemental)
	Properties of Numbers (1-3)
	Apply the Distributive Property (1-4)
	Combine Like Terms (1-4)
Assessment:	Quizzes at Teachers' Discretion
	Common Assessment 1
Resources:	Glencoe Algebra 1, Sections: 1-2, 1-1, 1-3, 1-4
	Radical Worksheets
	Common Assessment
Standards:	CC.2.1.HS.F.1 - Apply and extend the properties of exponents to solve problems with rational exponents.

CC.2.1.HS.F.2 - Apply properties of rational and irrational numbers to solve real world or mathematical problems.

Vocabulary: Associative property - $(3\cdot8)\cdot5=3\cdot(8\cdot5)$
Commutative property - $16+3=3+16$
Distributive property - $-2(4x+9)=-8x-18$
Identity property - $7+0=7$

Comments: Focus on Math at the beginning. Radicals only with integers.

Unit 2
Content: Solving Equations
Duration: 3 weeks

Essential Question:

How do we set up and solve problems to find unknown pieces of information?

Skills:
- Solve One-Step (Addition/Subtraction) (2-2)
- Solve One-Step (Multiplication/Division) (2-2)
- Solving Multi-Step Equations (2-3)
- Verbal and Algebraic Expressions (1-1)
- Translating and Solving Equations from Real-World Scenarios (2-1)
- Variable on Both Sides (2-4)
- Word Problems (Supplemental)
- Absolute Value Equations (2-5)

Assessment:
- Quizzes at Teachers' Discretion
- Common Assessment Units 2 + 3*

*Given at end of Unit 3 (Inequalities)

Resources: Glencoe Algebra I , 2-1, 2-2, 2-3, 2-4, 2-5

Standards:
CC.2.2.HS.D.8 - Apply inverse operations to solve equations or formulas for a given variable.
CC.2.2.HS.D.9 - Use reasoning to solve equations and justify the solution method.
CC.2.2.HS.D.10 - Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

Vocabulary: Coefficient
Constant
Inverse operations
(Literal equation)
Order of operations
Reciprocal
Absolute Value

Comments: Focus on Multi-Step and Variables on both sides, Interpret solutions to a problem in the context of the problem-solving situation included in each section.

2-8: Literal Equations if time permits

Unit 3

Content: Solving Inequalities

Duration: 3 weeks

Essential Question:

How do we represent a range of solutions to an inequality relationship?

Skills:

Solve one variable inequalities and represent solution set on a number line. (5-1, 5-2)

Solve multi-step inequalities and graph solution on the number line (5-3)

Solve compound inequalities (5-4)

Solve inequalities with absolute values (5-5)

Assessment:

Quizzes at Teachers' Discretion

Common Assessment Units 2 + 3*

*Given at end of Unit 3 (Inequalities)

Resources:

Glencoe Algebra I

Standards:

CC.2.2.HS.D.1 - Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.2.HS.D.7 - Create and graph equations or inequalities to describe numbers or relationships.

CC.2.2.HS.D.10 - Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

Vocabulary: Absolute Value
Inequality
Intersection
Solution set
Unions

Comments:

Unit 4
Content: Writing Equations and Function Notation
Duration: 3 weeks

Essential Question:	How can we translate English phrases into algebraic sentences?
Skills:	Translating Sentences into equations and vice-versa (2-1)
	Rate of Change and Slope (3-3)
	Writing Equations in Point-Slope Form (4-3)
	Transforming Equations from Point-Slope to Standard and Slope-Intercept (Supplemental)
	Writing Equations in Slope-Intercept (4-2)
	Functions (1-7)
Assessment:	Quizzes at Teachers' Discretion
	Common Assessment Unit 4 + 5
Resources:	Glencoe Algebra 1
	Supplemental Materials for Transforming Equations

Standards:

CC.2.2.HS.C.3 - Write functions or sequences that model relationships between two quantities.

CC.2.2.HS.C.1 - Use the concept and notation of functions to interpret and apply them in terms of their context.

CC.2.2.HS.C.6 - Interpret functions in terms of the situations they model

CC.2.2.HS.D.1 - Interpret the structure of expressions to represent a quantity in terms of its context.

Vocabulary:
Rate of Change
Slope
Point-Slope Form
Domain
Range
Function
(Discrete Function)
(Continuous Function)
Vertical Line Test
Nonlinear Function

Comments:

Unit 5
Content: Graphing in 2 Variables
Duration: 3 weeks

Essential Question: How do we represent equations, inequalities and functions using a coordinate plane?

Skills:
Graph linear equations in standard forms (3-1)
Direct Variation (3-4)
Graph linear equations in slope-intercept (4-1)
Scatter plots and Line of Best Fit (4-5)
Identify slope and write equations for parallel or perpendicular lines (4-4)
Graph Absolute Value (Supplemental)
Graphing Inequalities (5-6)

Assessment:
Quizzes at Teacher Discretion
Common Assessment Unit 4 + 5

Resources:
Glencoe Algebra 1
Supplemental Materials for Absolute Value

Standards:
CC.2.4.HS.B.3 - Analyze linear models to make interpretations based on the data.
CC.2.2.HS.C.3 - Write functions or sequences that model relationships between two quantities.
CC.2.2.HS.C.5 - Construct and compare linear, quadratic, and exponential models to solve problems.
C.2.1.HS.F.3 - Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.
CC.2.4.HS.B.2 - Summarize, represent, and interpret data on two categorical and quantitative variables.

CC.2.2.HS.D.10 - Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
CC.2.1.HS.F.4 - Use units as a way to understand problems and to guide the solutions of multi-step problems.

Vocabulary:
- Linear function
- Parallel lines
- Perpendicular lines
- Slope
- x-intercept
- y-intercept
- boundary

Comments:

Unit 6
Content: Systems of Equations and Inequalities
Duration: 3 weeks

Essential Question: How do we find and what is the meaning of the intersection of two equations?

Skills: Write and/or solve a system of linear equations using graphing, substitution, or elimination. (6-1, 6-2, 6-3, 6-4)

Use strategies for solving systems of equations to solve real-world problem situations and identify the best solution strategy given the system setup (6-5)

Write and/or solve a system of linear inequalities using graphing. (6-8)

Assessment: Quizzes at Teach Discretion
Common Assessment Unit 6

Resources: Glencoe Algebra I

Standards:

CC.2.2.HS.D.10 - Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

CC.2.2.HS.C.3 - Write functions or sequences that model relationships between two quantities.

CC.2.1.HS.F.5 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

CC.2.2.HS.D.9 - Use reasoning to solve equations and justify the solution method.

Vocabulary:
- Consistent
- Inconsistent
- Dependent
- Independent
- Elimination
- Substitution
- Infinitely many solutions
- No solutions
- System of Equations
- System of Inequalities

Comments:

Unit 7
Content: Polynomials and Exponents
Duration: 4 weeks

Essential Question: How do we apply basic operations to polynomial expressions?

Skills:
- Exponent Rules (7-1, 7-2)
- Naming Polynomials and Finding Degree (7-4)
- Add/Subtract polynomial expressions (7-5)
- Apply the distributive property to polynomials (7-6)
- Multiplying Polynomials (7-7)

Assessment:
- Quizzes at Teacher Discretion
- Common Assessment Unit 7 & 8*

* Given at the end of Unit 8 (Factoring)

Resources: Glencoe Algebra 1

Standards:

CC.2.2.HS.D.1 - Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.1.HS.F.1 - Apply and extend the properties of exponents to solve problems with rational exponents.

CC.2.2.HS.D.3 - Extend the knowledge of arithmetic operations and apply to polynomials.

CC.2.2.HS.D.5 - Use polynomial identities to solve problems.

CC.2.2.HS.D.6 - Extend the knowledge of rational functions to rewrite in equivalent forms.

Vocabulary:
- Degree of a polynomial
- Polynomial
- Term
- Monomial
- Binomial
- Trinomial
- Leading Coefficient

Comments:

Unit 8
Content: Factoring
Duration: 5 weeks

Essential Question: How do we represent polynomials in factored form?

Skills:

- Greatest Common Factors (8-1, 8-2)
- (Factor by Grouping)
- Factor algebraic expressions including differences of squares and trinomials (8-3, 8-4, 8-5, 8-6)
- Solving by Factoring (8-3, 8-4, 8-5, 8-6)
- Reduce/Simplify algebraic expressions in fractions by factoring*
- Simplify rational functions by canceling common factors*

Assessment:

- Quizzes at Teacher Discretion
- Common Assessment Units 7 & 8

Resources: Glencoe Algebra I

Standards:

CC.2.2.HS.D.1 - Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.2.HS.D.3 - Extend the knowledge of arithmetic operations and apply to polynomials.

CC.2.2.HS.D.5 - Use polynomial identities to solve problems.

CC.2.2.HS.D.9- Use reasoning to solve equations and justify the solution method.

CC.2.2.HS.D.6 - Extend the knowledge of rational functions to rewrite in equivalent forms.

Vocabulary: Factoring

Factoring by Grouping

Difference of Squares

Zero product Property

Perfect Square Trinomial

Comments:

*If time allows

Unit 9

Content: Data Analysis

Duration: 3 weeks

Essential Question: How do we quantify and interpret a data filled world?

Skills:

- Calculate and/or interpret the range, quartiles, measures of central tendency, and interquartile range of data. (0-12)
- Estimate or calculate to make predictions based on a circle, line, bar graph, or other representation. (Supplemental)
- Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem and leaf plots, measure of central tendency, or other representation). (0-13)
- Find probabilities for compound events. (0-11, 12-5)
- Find Odds for simple events (0-11)
- Permutations and Combinations (12-4)
- Find probabilities for events using permutations and combinations (12-5)

Assessment: Quizzes at Teacher Discretion

Resources: Glencoe Algebra I

Supplemental Worksheets

Standards: CC.2.4.HS.B.1 - Summarize, represent, and interpret data on a single count or measurement variable.

CC.2.4.HS.B.4 - Recognize and evaluate random processes underlying statistical experiments.

CC.2.4.HS.B.5 - Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

CC.2.4.HS.B.7 - Apply the rules of probability to compute probabilities of compound events in a uniform probability model.

Vocabulary: Compound probability

Interquartile range

Probability

Comments:

Unit 10

Content: Radical Expression and Equation

Duration: 4 weeks

Essential Question: How do we treat a radical within an equation?

Skills:
- Simplify square roots with variables (10-2)
- Simplify/evaluate expressions involving properties/laws of exponents (10-2)
- Add/Subtract/Multiply radical expressions (10-3)
- Radical Equations (10-4)
- Pythagorean Theorem (10-5)

Assessment: Quizzes at Teacher Discretion

Resources: Glencoe Algebra I

Standards: CC.2.1.HS.F.2 - Apply properties of rational and irrational numbers to solve real world or mathematical problems.

CC.2.1.HS.F.1 - Apply and extend the properties of exponents to solve problems with rational exponents.

Vocabulary: Pythagorean Theorem

Comments: