Math: Grade 8 Advanced/Algebra I

UNIT/Weeks (not consecutive)	Timeline/Topics	Essential Questions
2	**Foundations For Algebra** • Variables and expressions • Order of operations • The distributive property • An introduction to equations • Using tables to solve equations • Graphing in the coordinate plane • Patterns, equations, and graphs	• How can you represent quantities, patterns, and relationships?? • How are properties related to Algebra?
4.6	**Solving Inequalities** • Inequalities and their graphs • Solving inequalities using addition and subtraction • Solving inequalities using multiplication and division • Modeling multi-step inequalities • Solving multi-step inequalities • Working with sets • Compound inequalities • Absolute value • Unions and intersections	• How do you represent relationships between quantities that are not equal? • How can you solve inequalities? • Can inequalities that appear to be different be equivalent?
3.4	**Introduction to Functions** • Using graphs to relate quantities • Patterns and linear functions • Patterns and nonlinear functions • Graphing a function rule • Graphing functions and solving equations • Writing a function rule • Formalizing relations and functions • Sequences and functions	• How can you represent and describe functions? • Can functions describe real-world situations?
4.2	• **Linear Functions** • Rate of change and slope • Direct variation • Investigating $y = mx + b$ • Slope-intercept form	• What does the slope of a line indicate about the line? • What information does the slope of a line give you?

	• Point-slope form • Standard form • Parallel and perpendicular lines • Scatter plots and trend lines • Collecting linear data • Graphing absolute value functions • Characteristics of absolute value graphs	• How can you make predictions based on a scatter plot?
1.4	**Systems of Equations and Inequalities** • Application of linear systems • Linear inequalities • Systems of linear inequalities	• How can you solve a system of equations or inequalities? • Can systems of equations model real-world situations?
2.2	**Exponents and Exponential Functions** • Zero and negative exponents • Scientific notation • Multiplying powers • Powers of powers and products of powers • Multiplication properties of exponents • Division properties of exponents • Exponential functions • Geometric sequences • Exponential growth and decay	• How can you represent very large and very small numbers? • How can you simplify expressions involving exponents? • What are the characteristics of exponential functions?
3.4	**Polynomials and Factoring** • Adding and subtracting polynomials • Multiplying and factoring • Using models to multiply • Multiplying binomials • Using models to factor • Factoring trinomials • Factoring trinomials with coefficients greater than one	• How are different algebraic equations equivalent? • How are the properties of real numbers related to polynomials?
3.8	**Quadratic Functions and Equations** • Quadratic graphs • Functions • Finding roots • Factoring to solve quadratic equations	• What are the characteristics of quadratic functions? • How can you solve a quadratic equation? • How can you use functions to model real-world situations?

	• Quadratic formula and the discriminate • Linear, quadratic, and exponential models • Performing regressions • Systems of linear and quadratic equations	
1.6	**Rational Expressions and Functions** • Solving rational equations • Inverse variation • Graphing rational functions	• How are radical expressions represented? • What are the characteristics of square root functions? • How can you solve a radical equation?
1.6	**Data Analysis and Probability** • Frequency and histograms • Measures of central tendency and dispersion • Box and whisker plots	• How can collecting and analyzing data help make decisions or predictions? • How can you make and interpret different representations of data? • How is probability related to real world events?
2.6	**Tools of Geometry** • Points, Lines, and Planes • Nets and Drawings for Visualizing Geometry • Angles • Angle Pairs • Segments • Midpoints and the Distance formula • Basic Constructions	• How can you represent a three-dimensional figure with a two-dimensional drawing? • What are the building blocks of geometry? • How can you describe the attributes of a segment or angle?
2.4	**Parallel and Perpendicular Lines** • Lines and Angles • Properties of Parallel Lines • Proving Lines Parallel • Parallel and Perpendicular Lines • Slopes of Parallel and Perpendicular Lines • Parallel Lines and Triangles • Constructing Parallel and Perpendicular Lines • Equations of Lines in the Coordinate Plane	• How do you write an equation of a line in the coordinate plane? • How do you prove that two lines are parallel or perpendicular? • What is the sum of the measures of the angles of a triangle?