Algebra 1
Grade 9-12

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Hazelwood School District

Mission Statement

We are a collaborative learning community guided by a relentless focus to ensure each student achieves maximum growth.

Vision Statement

HSD will foster lifelong learners, productive citizens and responsible leaders for an ever-evolving society.

Board of Education on January 5, 2010

Goals

Goal #1: Hazelwood students will meet or exceed state standards in all curricular areas with emphasis in reading, writing, mathematics, science and social studies.

Goal #2: Hazelwood staff will acquire and apply skills necessary for improving student achievement.

Goal #3: Hazelwood School District, the community and all families will support the learning of all children

COURSE TITLE: Algebra I

GRADE LEVEL: 9 – 12

CONTENT AREA: Mathematics

Course Description:

The fundamental purpose of this course is to formalize and extend the mathematics that students learned in the middle grades. Because it is built on the middle grades standards, this is a more ambitious version of Algebra I than has generally been offered. The critical areas, called units, deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

Course Rationale:

Algebra I is designed to provide students with a strong foundation in mathematics in order to prepare students for upper level mathematics courses. Students will also develop problem-solving skills by engaging in algebraic concepts.

Course Scope and Sequence		
Unit 1: Relationships Between Quantities and Reasoning with Equations (22 days @ 90 min)	**Unit 2:** Linear and Exponential Relationships (19 days @ 90 min)	**Unit 3:** Descriptive Statistics (12 Days @ 90 min)
Unit 4: Expressions and Equations (15 Days @ 90 min)	**Unit 5:** Quadratic Functions and Modeling (17 days @ 90 min)	

Approved Course Materials and Resources:

Glencoe Algebra 1 Textbook & Ancillaries, ALEKs Software, Missouri Learning Standards for Math, MAP Math Shell, Illustrative Mathematics Website, Achieve the Core Website, LearnZillion Website;

Unit Objectives

Unit 1: Relationships Between Quantities and Reasoning with Equations
- Reason quantitatively and use units to solve problems.
- Interpret the structure of expressions.
- Create equations that describe numbers or relationships.
- Understand solving equations as a process of reasoning and explain the reasoning.
- Solve equations and inequalities in one variable.

Unit 2: Linear and Exponential Relationships
- Extend the properties of exponents to rational exponents.
- Represent and solve equations, inequalities and systems graphically.
- Understand the concept of a function, function notation and interpret functions that arise in applications in terms of a context.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities and from existing functions.
- Construct and compare linear, quadratic, and exponential models and solve problems.
- Interpret expressions for functions in terms of the situation they model.

Unit 3: Descriptive Statistics
- Summarize, represent, and interpret data on a single count or measurement variable.
- Summarize, represent, and interpret data on two categorical and quantitative variables.
- Interpret linear models.

Unit 4: Expressions and Equations
- Interpret the structure of expressions.
- Write expressions in equivalent forms to solve problems.
- Perform arithmetic operations on polynomials.
- Create equations that describe numbers or relationships.
- Solve equations and inequalities in one variable.
- Solve systems of equations.

Unit 5: Quadratic Functions and Modeling
- Use properties of rational and irrational numbers.
- Interpret functions that arise in applications in terms of a context.
- Analyze functions using different representations.
- Build a function that models a relationship between two quantities.
- Build new functions from existing functions.
- Construct and compare linear, quadratic, and exponential models and solve problems.

Quantity	Algebra	Functions	
Rational exponent	Linear	Domain	
Real number	Expression	Range	
Quadratic	Equation	Function notation	
Polynomial	Exponential function	Fibonacci sequence	
Fundamental theorem of Algebra	Geometric series	Recursive process	
		Intercepts	
		Increasing intervals	
		Decreasing intervals	
		Positive intervals	
		Negative intervals	
		Symmetries	
		End behavior	
		Periodicity	
		Rate of change	

Statistics and Probability

Dot plot Histogram Box plot Interquartile range Standard deviation Outlier Frequency table Relative frequency Residuals Correlation Causation Sample survey Experiment Observational studies	

High School Number and Quantity	High School Algebra	High School Functions	
Rational exponent Real number Quadratic equation Polynomial Fundamental theorem of Algebra Vector Initial point Terminal point Velocity	Complete the square Maximum Minimum Exponential function Geometric series Remainder Theorem Binomial Theorem Pascal's Triangle	Domain Range Function notation Fibonacci sequence Recursive process Intercepts Increasing intervals Decreasing intervals Positive intervals Negative intervals Symmetries End behavior Periodicity Rate of change Step function Absolute value function Asymptote	Exponential function Period Midline Amplitude Exponential growth Exponential decay Constant function Arithmetic sequence Geometric sequence

High School Geometry		High School Statistics and Probability	
Angle Circle Perpendicular lines Parallel lines Line segments Point Line Arc Rigid motion Congruent Angle-Side-Angle		Dot plot Histogram Box plot Interquartile range Standard deviation Outlier Frequency table Relative frequency Residuals Correlation Causation Sample survey Experiment Observational studies	Simulation models Subsets Unions Intersections Complements Independent Conditional probability 2-way frequency table Addition Rule Multiplication Rule Permutations Combinations Theoretical probability