

# Algebra Explorations

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This course provides students with the foundations to continue on to additional mathematics courses. Algebra Explorations builds upon the Pre-Algebra curriculum and continues to move at a slower pace to ensure student understanding and giving students the opportunity to get additional help when needed. Success in this course will better prepare students to reach more advanced topics in their high school math careers. Algebra Explorations requires continual effort and attention. Expectations are for students to do their best everyday. It is very important that students seek help when they are feeling confused, lost, or overwhelmed. We want students to experience success in mathematics and feel confident in their abilities.

## Graduation Standards

**Standard 1** – Reason and model quantitatively, using units and number systems to solve problems.

**Standard 2** – Interpret, represent, create and solve algebraic expressions.

**Standard 3** – Interpret, analyze, construct, and solve linear, quadratic, and trigonometric functions.

Unit 1	Graphing Linear Equations
Summary	Students will be able to identify different forms, and change between all forms of linear equations. They will be able to calculate slope algebraically and relate it to real-world situations. They will be able to create inverse linear functions both algebraically and graphically. They will be able to compare and contrast a linear relationship represented graphically and algebraically.
Performance Indicators Assessed in Unit	<b>S2: B.</b> Write expressions in equivalent forms to solve problems. (A.SSE.B) <b>S3: C.</b> Analyze functions using different representations. (F.IF.C.7A-C,E,8-9) <b>S3: E.</b> Build new functions from existing functions. (F.BF.B.3,4A)
Unit 2	Linear Inequalities and Systems of Linear Equations and Inequalities
Summary	Students will be able to solve compound inequalities and graph their solutions. Students will be able to solve absolute value equations and inequalities in one variable and graph their solution on a number line. Students will be able to graph inequalities into variables on a coordinate plane. This unit will have a strong emphasis on the application of inequalities and absolute value on application to real-world problems. Students will be introduced to systems of linear equations and inequalities. They learn how to solve by graphing systems of equations and inequalities, and classify the systems as consistent or inconsistent, dependent or independent. Students also learn how to apply algebraic methods including, substitution, elimination, using addition and subtraction, and elimination using multiplication. Students will create equations and inequalities that model real-world data, and determine which method is best to solve the system.
Performance Indicators Assessed in Unit	<b>S2: G.</b> Create equations that describe numbers or relationships. (A.CED.A) <b>S2: H.</b> Understand solving equations as a process of reasoning and explain the reasoning. (A.REI.A) <b>S2: I.</b> Solve equations and inequalities in one variable. (A.REI.B) <b>S2: J.</b> Solve systems of equations. (A. REI.C.5-7)

	<b>S2: K.</b> Represent and solve equations and inequalities graphically. (A.REI.D)
<b>Unit 3</b>	<b>Exponents and Quadratic Expressions/Equations and Quadratic Functions and Equations</b>
Summary	Students will be algebraically manipulating quadratic equations to reveal key features of the related function. Students will first learn about polynomials and operations involving monomials and polynomials. They will also solve the quadratic equations for their roots by factoring, completing the square, and using the quadratic formula. Students will be identifying and interpreting key features of quadratic functions. They will be able to manually graph a quadratic function, and in addition graph using technology. They will also graph systems of linear and quadratic functions. Students will then explore transformations on a coordinate plane of a quadratic function. They will be algebraically manipulating quadratic equations to reveal key features of the related function. Students will first learn about polynomials and operations involving monomials and polynomials. They will also solve the quadratic equations for their roots by factoring, completing the square, and using the quadratic formula.
Performance Indicators Assessed in Unit	<b>S2: A.</b> Interpret the structure of expressions. (A.SSE.A) <b>S2: B.</b> Write expressions in equivalent forms to solve problems. (A.SSE.B) <b>S2: C.</b> Perform arithmetic operations on polynomials. (A.APR.A) <b>S2: D.</b> Understand the relationship between zeros and factors of polynomials. (A.APR.B) <b>S2: E.</b> Use polynomial identities to solve problems. (A.APR.C.4) <b>S2: F.</b> Rewrite rational expressions. (A. APR.D.6) <b>S2: I.</b> Solve equations and inequalities in one variable. (A.REI.B) <b>S2: J.</b> Solve systems of equations. (A. REI.C.5-7) <b>S2: K.</b> Represent and solve equations and inequalities graphically. (A.REI.D) <b>S3: B.</b> Interpret functions that arise in applications in terms of the context. (F.IF.B) <b>S3: C.</b> Analyze functions using different representations. (F.IF.C.7A-C,E,8-9) <b>S3: E.</b> Build new functions from existing functions. (F.BF.B.3,4A)
<p><b>Make-up Work/Assessments:</b> When class is missed as a result of a student excused absence.</p> <p><b>Formative Work/Assessment</b> - One additional class period for each class missed.</p> <p><b>Summative Assessment</b> - Scheduled within 5 school days of the date a student returns to school (or as determined by the teacher.)</p> <p><b>Summative Retake Form</b> must be completed and submitted.</p>	