

Abington Heights School District

Algebra I Curriculum



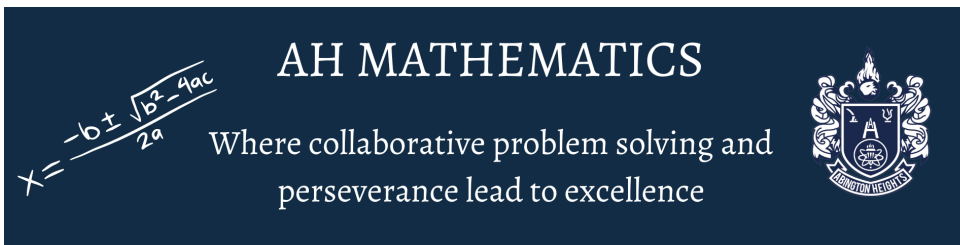
In Algebra I, students develop their numeracy skills through the following areas of study:

1. Operations with Real Numbers and Expressions
2. Linear Equations
3. Linear Inequalities
4. Functions
5. Coordinate Geometry
6. Data Analysis

Board Approval Date: June 7, 2023

Adoption: 2023 - 2024 SY

Review Date:



Abington Heights Math Framework

Stakeholders	Actions
Students	<ul style="list-style-type: none"> ★ Engage in mathematical discussions, share their ideas openly, be inquisitive, seek to understand and learn more about mathematical concepts, and try their best daily. ★ Exhibit creativity and curiosity in problem solving individually and collaboratively. ★ Persevere in engaging and challenging daily mathematical practice. ★ Come prepared to learn every day.
Teachers	<ul style="list-style-type: none"> ★ Create a safe and collaborative classroom environment where students feel vested in a shared vision for mathematical excellence. ★ Develop high quality instruction that meets the needs of all learners through differentiation. ★ Use a variety of 21st century methodologies to advance learning. ★ Partner with parents and guardians to support student success. ★ Establish a collaborative community within the building and amongst grade levels to ensure a cohesive level of instruction.
Building Leaders	<ul style="list-style-type: none"> ★ Deeply understand the needs of teachers, students, the instructional materials being used, programs being implemented, and the expectations for state-level assessment scores <ul style="list-style-type: none"> ○ Knowledgeable about program and grade level standards ○ Ensure consistent and equal access to high-quality instructional materials and resources, building. ★ Be partners with teachers, students and families: <ul style="list-style-type: none"> ○ Provide guidance and support to the mathematical community. ○ Understand needs of teachers, students and families. ★ Trust the educators to make professional decisions based on program, student, and district needs.
Central Admin	<ul style="list-style-type: none"> ★ Effectively communicate to the school board and community specific areas of need and how to support teachers and building leaders in a quest for mathematical excellence ★ Deeply understand the needs of teachers, students, the instructional materials being used, programs being implemented, and the expectations for state-level assessment scores <ul style="list-style-type: none"> ○ Have a common metric for mathematical excellence. ○ Ensure consistent and equal access to high-quality instructional materials and resources, district. ○ Re-examine best practices/curriculum routinely (6 years). ★ Support a culture of collaboration between the other stakeholder groups to maintain the standard of excellence of the Abington Heights ★ Trust the educators to make professional decisions based on program, student, and district needs.
Parents/Community	<ul style="list-style-type: none"> ★ Be a strong support system and contribute by building a positive math community for students. ★ Encourage a positive math mindset. ★ Have conversations with their children about school and ask what they are learning about in school. ★ Be open, receptive to the district's ideas about student learning and reach out to teachers/school to learn more about how they can support. ★ Trust the educators to make professional decisions based on program, student, and district needs.
School Board	<ul style="list-style-type: none"> ★ Provide the fiscal resources to support: <ul style="list-style-type: none"> ○ Highly qualified professionals for mathematics ○ High-quality instructional materials ○ Effective and efficient math interventions for remediation ○ Professional development for math content and instructional practices ★ Trust the educators to make professional decisions based on program, student, and district needs.

Algebra I Scope and Sequence

Month	Unit	Estimated Number of Weeks
September	Solving Equations	4
October	Solving Equations	2
	Inequalities	2
November - December	Linear Equations	6
January	Polynomial Operations	2
	Systems of Equations	2
February	Properties of Exponents	1
	Polynomial Operations	1
	Radicals	2
March	Systems of Linear Inequalities	2
	Rational Expressions	2
April	Data Analysis	2
May	Solving Quadratic Equations	4
June	Final Exam Review	1

SEMESTER 1

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Solving Equations	<p>What does it mean to simplify an expression?</p> <p>How do I solve an equation?</p> <p>Which approach should I take to solve an equation, given its initial presentation?</p>	<p>Simplifying expressions</p> <p>Distributive property</p> <p>One and multistep equations</p> <p>Absolute value equations</p> <p>Proportions</p> <p>Radical equations</p> <p>Literal equations</p>	<p>Combine like terms</p> <p>Distribute</p> <p>Solve linear equations in one variable</p> <p>Apply inverse operations to isolate a variable</p>	<p>CC.2.1.HS.F.3</p> <p>CC.2.1.HS.F.4</p> <p>CC.2.1.HS.F.5</p> <p>CC.2.2.HS.D.8</p> <p>CC.2.2.HS.D.9</p>	<p>Flipcharts for:</p> <ul style="list-style-type: none"> - Dist. Prop & Combining Like Terms - Solving One and Multi-step equations - Absolute Value Eq. - Proportions - Radical Equations - Literal Equations <p>Radical & Proportion Go Formative</p> <p>Chapter 1 Multiple Choice Activity</p>	<p>Radical & Proportion Go Formative</p> <p>Chapter 1 Multiple Choice Activity</p> <p>Quiz - CLT, Dist Prop, and Solving Linear Eq.</p> <p>Quiz - Proportions & Radical Equations</p> <p>Chapter 1 Test</p>
Inequalities	<p>How do I graph an inequality?</p> <p>How do I solve an inequality?</p>	<p>Graphing Inequalities</p> <p>One and multistep inequalities in one variable</p>	<p>State the inequality modeled by a graph</p>	<p>CC.2.1.HS.F.5</p> <p>CC.2.2.HS.D.7</p> <p>CC.2.2.HS.D.9</p> <p>CC.2.2.HS.D.10</p>	<p>Flipcharts for:</p> <ul style="list-style-type: none"> - Simple Inequalities - Compound Inequalities 	<p>Inequalities Go Formative</p> <p>Inequalities Test</p>

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Inequalities (continued)	How do I algebraically model the verbal expression of an inequality?	Compound inequalities Absolute value inequalities	Sketch a graph to depict the solution of an inequality Obtain an graph the solution of linear inequalities involving one variable Write, solve, and graph compound inequalities Solve and graph absolute value inequalities		- Absolute Value Inequalities Inequalities Go Formative	
Linear Equations	How do I graph a line? What do the different values in a linear equation represent? How do I write an equation to model a graph of a linear function?	Slope Slope-intercept form Point slope form Graphing linear equations Interpreting linear equations	Determine slope given two points Determine slope from a graph Determine slope-intercept form, given a linear equation in any form	CC.2.1.HS.F.3 CC.2.1.HS.F.4 CC.2.1.HS.F.5 CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 CC.2.2.HS.C.1 CC.2.2.HS.C.2	Linear Relationships 1 Guided Exercise Linear Relationships 2 Guided Exercise Delta Math - Linear Relationships 1 Delta Math - Linear Relationships 2	Delta Math - Linear Relationships 1 Delta Math - Linear Relationships 2 Delta Math - Graphing Practice Set Linear Equations Test

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Linear Equations (continued)			<p>Determine the equation of a line given two points, a point and a slope, information about parallel and perpendicular lines</p> <p>Given a graph or table, determine the equation of the modeled line Interpret and analyze linear relationships</p>	CC.2.2.HS.C.3 CC.2.2.HS.C.4 CC.2.2.HS.C.5 CC.2.2.HS.C.6 CC.2.4.HS.B.1 CC.2.4.HS.B.2 CC.2.4.HS.B.3		
Polynomial Operations	<p>How do I add, subtract, and multiply polynomials?</p> <p>What does it mean to factor a polynomial and how do I do it?</p> <p>What terminology is used to classify polynomials by degree and by number of terms?</p>	<p>Add polynomial expressions</p> <p>Subtract polynomial expressions</p> <p>Multiply polynomial expressions</p> <p>Factor polynomial expressions</p>	<p>Add and subtract polynomial expressions</p> <p>Distribute</p> <p>Combine like terms</p> <p>Multiply like bases, incorporating properties of exponents</p> <p>Identify a GCF</p>	CC.2.1.HS.F.2 CC.2.2.HS.D.1 CC.2.2.HS.D.2 CC.2.2.HS.D.3 CC.2.2.HS.D.5 CC.2.2.HS.D.6	Flip charts for <ul style="list-style-type: none"> - Addition & subtraction of polynomials and factoring using a GCF - Properties of exponents and multiplying binomials - Squaring Binomials - Dist. Property (general) 	<p>Delta Math - Add & Subt. Polynomials, GCF factoring</p> <p>Delta Math - Terminology & Polynomial Arithmetic</p> <p>Delta Math - Multiplying Polynomials</p> <p>Quiz - Terminology, Add & Subt. Polynomials</p>

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Polynomial Operations (continued)	What is the degree of a polynomial?		Factor using a GCF Factor trinomials, $a=1$ Factor trinomials involving a GCF, where $a \neq 1$		Delta Math - Add & Subt. Polynomials Delta Math - Terminology & Polynomial Arithmetic Delta Math - Multiplying Polynomials	Quiz - Distributive Property Test - Polynomial Operations
Systems of Equations	What is a system of equations? What does the solution to a system of equations represent? In what ways can I determine the solution to a system of linear equations?	Solve systems of equations Graph systems of equations Analyze and interpret system of equations word problems and graphs	Solve by elimination Solve by graphing Model a system of equations word problem algebraically Model a system of equations word problem graphically	CC.2.1.HS.F.5 CC.2.2.HS.D.7 CC.2.2.HS.D.9 CC.2.2.HS.D.10	Flip Charts for: - Solving Systems by Graphing - Solving Systems by Elimination 1 - Solving Systems by Elimination 2	Quiz - System of Equations
Properties of Exponents	What rules govern the properties of exponents and why do they hold true?	Zero Power property Multiplication property Division property	Apply each of the exponent properties to simplify expressions	CC.2.1.HS.F.1 CC.2.1.HS.F.2 CC.2.2.HS.D.9	Flip Charts for: - Properties of Exponents	Quiz - Properties of Exponents

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Properties of Exponents (continued)	What qualifies an expression involving exponents as simplified?	Power property Negative exponents	Simplify expressions involving negative exponents Use properties of exponents to develop of expressions to model solutions of word problems			
Radicals	What is a perfect square? What qualifies a radical expression as being in reduced form? How do radical expressions interact with each other?	Perfect squares Reduced form of radical expressions Operations on radical expressions	Identify a perfect square and its root Reduce the square root of a number that is not a perfect square Reduce an expression involving a coefficient of the radical and a radicand that is not a perfect square Add/Subtract Radical Expressions	CC.2.1.HS.F.1 CC.2.1.HS.F.2	Flip Charts for: - Simplifying Radicals - Operations on Radical Expression	Quiz - Radicals

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Radicals (continued)			Multiply/Square radical expressions involving monomials and binomials			
Systems of Linear Inequalities	<p>What is a system of linear inequalities?</p> <p>What form does the solution to a system of linear inequalities take?</p> <p>How can I write a system of linear inequalities to model a word problem?</p>	<p>Graphing linear inequalities</p> <p>Systems of linear inequalities</p>	<p>Graph a linear inequality</p> <p>Graph a system of linear inequalities, identifying the solution set within the coordinate plane</p> <p>Interpret and analyze a graphical depiction of a system of linear inequalities</p> <p>Apply a knowledge of system of linear inequalities to problems presented in a verbal format</p>	<p>CC.2.1.HS.F.5</p> <p>CC.2.2.HS.D.7</p> <p>CC.2.2.HS.D.10</p>	<p>Flipcharts for :</p> <ul style="list-style-type: none"> - Graphing Linear Ineq. - Graphing Systems of Linear Ineq <p>Delta Math:</p> <ul style="list-style-type: none"> - Graphing Linear Ineq - Graph and Interpret Systems of Linear Ineq 	<p>Quiz - Systems of Linear Inequalities</p> <p>Delta Math:</p> <ul style="list-style-type: none"> - Graphing Linear Ineq - Graph and Interpret Systems of Linear Ineq

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Rational Expressions	<p>What is a rational expression?</p> <p>How do I simplify a rational expression consisting of only monomials?</p> <p>How do I simplify a rational expression that contains binomials and/or trinomials?</p>	<p>Rational expressions with monomials</p> <p>Rational expressions with binomials and/or trinomials</p>	<p>Apply properties of exponents to reduce rational expressions</p> <p>Obtain fully factored form of polynomials</p> <p>Reduce factored rational expressions</p>	<p>CC.2.1.HS.F.1</p> <p>CC.2.2.HS.D.3</p> <p>CC.2.2.HS.D.6</p>	<p>Flipchart for</p> <ul style="list-style-type: none"> - Factoring review - Simplifying rational exp. 	<p>Quiz - Rational Expressions</p>
Data Analysis	<p>What are the measures of central tendency and what do they represent?</p> <p>How do I calculate the measures of central tendency?</p> <p>What is a box and whisker plot/ dot plot/ stem and leaf plot and what information can be determined from it?</p>	<p>Mean, Median, Mode</p> <p>Range, Interquartile Range</p> <p>First, Second, Third Quartile</p> <p>Box & Whisker Plot</p> <p>Stem and Leaf Plot</p> <p>Dot Plot</p> <p>Quartiles</p> <p>Correlation</p>	<p>Calculate or identify the measure of central tendency for a data set.</p> <p>Create a box and whisker plot, dot plot, or stem and leaf plot for a set of data</p> <p>Analyze and interpret a box and whisker plot, dot plot, or stem and leaf plot</p>	<p>CC.2.4.HS.B.1</p> <p>CC.2.4.HS.B.3</p> <p>CC.2.4.HS.B.5</p>	<p>Flipchart & Guided Notes Activities for:</p> <ul style="list-style-type: none"> - Measures of Central Tendency - Box & Whiskers Plots - Line of Best Fit <p>Delta Math:</p> <ul style="list-style-type: none"> - Box & Whiskers Plot - Statistics Summary 1 - Line of Best Fit 1 	<p>Quiz - Data Analysis</p> <p>Delta Math:</p> <ul style="list-style-type: none"> - Box & Whiskers Plot - Statistics Summary 1 - Line of Best Fit 1 - Line of Best Fit 2 - Statistics Summary 2

Unit	Essential Questions	Content	Skills	PA Core Standards	Activities	Assessment/ Evidence of Learning
Data Analysis (continued)	What is a line of best fit? How can a line of best fit be determined? How can it be used to interpret data?	Line of Best Fit			<ul style="list-style-type: none"> - Line of Best Fit 2 - Statistics Summary 2 	
Solving Quadratic Equations	<p>How many solutions should a given equation have?</p> <p>How can I decide what approach to take when solving a quadratic equation? How do I solve a quadratic equation?</p>	<p>Solve quadratic equations by factoring</p> <p>Solve quadratic equations by square roots</p> <p>Solve quadratic equations using the quadratic formula</p>	<p>Use the technique of solving by factoring to obtain rational roots to a quadratic equation</p> <p>Use the technique of solving using square roots to obtain rational and irrational roots of a quadratic equation</p> <p>Use the technique solving using the quadratic formula to obtain rational, irrational, and imaginary roots of a quadratic equation</p>	<p>CC.2.2.HS.D.9</p> <p>CC.2.2.HS.D.10</p>	<p>Flipcharts for:</p> <ul style="list-style-type: none"> - Solving Equations by factoring - Solving Equations by Sq. Roots - Solving Equations using quadratic formula 	Quiz - Solving Quadratic Equations



Portrait of an Abington Heights Mathematician

By the end of Algebra I, students will:

Operations with Real Numbers and Expressions	Linear Equations	Linear Inequalities	Functions	Coordinate Geometry	Data Analysis
<ul style="list-style-type: none"> <input type="checkbox"/> Compare and/or order any real numbers <input type="checkbox"/> Simplify square roots <input type="checkbox"/> Find the greatest common factor and/or least common multiple for sets of monomials <input type="checkbox"/> Simplify/evaluate expressions involving properties/law of exponents, roots, and/or absolute values to solve problems <input type="checkbox"/> Use estimation to solve problems <input type="checkbox"/> Add, subtract, and/or multiply polynomial expressions <input type="checkbox"/> Factor algebraic expressions, including difference of squares and trinomials <input type="checkbox"/> Simplify/reduce rational algebraic expressions 	<ul style="list-style-type: none"> <input type="checkbox"/> Write, solve, and/or apply a linear equation <input type="checkbox"/> Use and/or identify an algebraic property to justify any step in an equation-solving process; interpret solutions in context of the problem situation <input type="checkbox"/> Write and/or solve a system of linear equations using graphing, substitution, and/or elimination; interpret solutions in context of the problem situation 	<ul style="list-style-type: none"> <input type="checkbox"/> Write or solve compound inequalities; graph solutions on number line <input type="checkbox"/> Identify or graph the solution set to a linear inequality on a number line; interpret solutions in context of the problem situation <input type="checkbox"/> Write and/or solve a system of linear inequalities using graphing; interpret solutions in context of the problem situation 	<ul style="list-style-type: none"> <input type="checkbox"/> Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically <input type="checkbox"/> Determine whether a relation is a function, given a set of points or a graph <input type="checkbox"/> Identify the domain and range of a relation <input type="checkbox"/> Create, interpret, and/or translate various representations of a linear function (graph, table, equation) 	<ul style="list-style-type: none"> <input type="checkbox"/> Identify, describe, and/or use constant rates of change <input type="checkbox"/> Apply the concept of linear rate of change (slope) to solve problems <input type="checkbox"/> Write a linear equation when given the graph of a line, two points on the line, or the slope and a point on the line <input type="checkbox"/> Determine the slope and/or y-intercept represented by a linear equation or graph <input type="checkbox"/> Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot 	<ul style="list-style-type: none"> <input type="checkbox"/> Calculate and/or interpret the range, quartiles, and interquartile range of data <input type="checkbox"/> Estimate or calculate to make predictions based on circle, line, bar graph, or measure of central tendency <input type="checkbox"/> Analyze data, make predictions, and/or answer questions based on data-displays <input type="checkbox"/> Make predictions using the equations or graphs of best-fit lines of scatter plots <input type="checkbox"/> Find probabilities for compound events and represent as a fraction, decimal, or percent