COURSE: Algebra I

GRADE LEVEL: Ninth, Tenth, Eleventh and Twelfth Grade

LENGTH OF COURSE: 90 days/semester (Block Schedule)

TEXT: Algebra I

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COURSE DESCRIPTION:

Algebra I includes the study and application of the following topics: fundamental operations on real numbers, polynomials, factoring, fractions, inequalities, and irrational numbers.

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Wallenpaupack Area School District

Course: Algebra I

Unit: Tools of Algebra

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.4.11.E
2.5.11.A
2.5.11.B
2.5.11.C
2.6.11.A
2.6.11.B
2.5.11.D
2.8.11.D
2.8.11.I
2.8.11.J

Topics:	Skills:
Using variables Exponents and order of operations Exploring real numbers Adding real numbers Subtracting real numbers Multiplying and dividing real numbers The distributive property Properties of real numbers Graphing data on the coordinate plane	Model relationships with variables Model relationships with equations and formulas Simplify and evaluate expressions/formulas Simplify and evaluate expressions containing grouping symbols Classify numbers Compare numbers Add real numbers using models and rules Apply addition Subtract real numbers Apply subtraction Multiply real numbers Divide real numbers Multiply real numbers Divide real numbers Use the Distributive Property Simplify algebraic expressions Identify properties Use deductive reasoning Graph points on the coordinate plane Analyze data using scatter plots
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with gridded responses Sample standardized tests involving reading and open ended responses Class assignments/participation Teacher observation Board work Homework

Course: Algebra I

Unit: Solving Equations

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.2.11.C
2.4.11.B
2.4.11.E
2.5.11.A
2.5.11.B
2.5.11.C
2.5.11.D
2.6.11.A
2.8.11.D
2.8.11.E
2.8.11.F
2.8.11.G
2.8.11.H

Topics:	Skills:
Solving one-step equations Solving two-step equations Solving multi-step equations Equations with variables on both sides Equations and problem solving formulas Using measures of central tendency	Solve equations using addition and subtraction Solve equations using multiplication and division Solve two-step equations Use deductive reasoning Use the distributive property when combining like terms Use the distributive property when solving equations Solve equations with variables on both sides Identify equations that are identities or have no solution Define a variable in terms of another variable Model distance-rate-time problems Transform literal equations Find mean, median, and mode Make and use stem-and-leaf plots
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with short responses Class assignments/participation Teacher observation Board work Homework

Wallenpaupack Area School District

Course: Algebra I	**Grade Level:** Grade 9, 10, 11, 12
Unit: Solving Inequalities	**PA Standards:** 2.1.11.A
	2.2.11.A
	2.4.11.E
	2.5.11.B
	2.5.11.C
	2.5.11.D
	2.8.11.D
	2.8.11.E
	2.8.11.F
	2.8.11.G
	2.8.11.H

Topics:	**Skills:**
Inequalities and their graphs Solving inequalities using addition and subtraction Solving inequalities using multiplication and division Solving multi-step inequalities Compound inequalities Absolute value equations and inequalities	Identify solutions of inequalities Graph and write inequalities Use addition to solve inequalities Use subtraction to solve inequalities Use multiplication to solve inequalities Use division to solve inequalities Solve multi-step inequalities with variables on one side Solve multi-step inequalities with variables on both sides Solve and graph inequalities containing and solve and graph inequalities containing or solve equations that involve absolute value Solve inequalities that involve absolute value
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with extended responses Class assignments/participation Teacher observation Board work Homework

Course: Algebra I

Unit: Solving and Applying Proportions

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.2.11.C
2.2.11.D
2.4.11.E
2.5.11.B
2.5.11.C
2.5.11.D
2.6.11.C
2.6.11.D
2.6.11.F
2.6.11.H
2.6.11.I
2.7.11.A
2.7.11.B
2.7.11.C
2.7.11.D
2.7.11.E
2.8.11.D
2.8.11.S
2.9.11.B
2.9.11.D

Topics:	Skills:
Ratio and proportion Proportions and similar figures Proportions and percent equations Percent of change Applying ratios to probability Probability of compound events	Find ratios and rates Solve proportions Find missing measures of similar figures Use similar figures when measuring indirectly Use proportions when solving percent problems Write and solve percent equations Find percent of change Find percent error Find experimental probability Find theoretical probability Find the probability of independent events Find the probability of dependent events

Activities:	Performance Assessments:
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with quantitative comparisons Class assignments/participation Teacher observation Board work Homework

Course: Algebra I

Unit: Graphs and Functions

8 blocks

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.4.11.E
2.5.11.B
2.5.11.C
2.5.11.D
2.6.11.A
2.6.11.D
2.8.11.A
2.8.11.B
2.8.11.C
2.8.11.E
2.8.11.F
2.8.11.J
2.8.11.K
2.8.11.O
2.8.11.P
2.8.11.Q
2.8.11.R
2.8.11.S
2.8.11.T
2.11.11.D

Topics:	Skills:
Relating graphs to events Relations and functions Functions rules, tables, and graphs Writing a function rule Direct variation Describing number patterns	Interpret, sketch, and analyze graphs from situations Identify relations and functions Evaluate functions Model functions using rules, tables, graphs Write a function rule given a table or a real-world situation Write the equation of a direct variation Use ratios and proportions with direct variations Use inductive reasoning in continuing number patterns Write rules for arithmetic sequences
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Class assignments/participation Teacher observation Board work Homework

Course: Algebra I

Unit: Linear Equations and Their Graphs

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.2.11.B
2.2.11.C
2.4.11.E
2.5.11.B
2.5.11.C
2.5.11.D
2.6.11.A
2.6.11.B
2.6.11.D
2.6.11.E
2.6.11.F
2.6.11.G
2.8.11.A
2.8.11.D
2.8.11.E
2.8.11.K
2.8.11.L
2.8.11.M
2.8.11.N
2.8.11.Q
2.8.11.R
2.8.11.S
2.8.11.T

Topics:	Skills:
Rate of change and slope Slope-intercept form Standard form Point-slope form and writing linear equations Parallel and perpendicular lines Scatter plots and equations of lines Graphing absolute value equations	Find rates of change from tables and graphs Find slope Write linear equations in slope-intercept form Graph linear equations Graph equations using intercepts Write equations in standard form Graph and write linear equations using point-slope form Write a linear equation using data Determine whether lines are parallel Determine whether lines are perpendicular Write an equation for a trend line and use it to make predictions Write the equation for a line of best fit

	Skills: (continued)
	and use it to make predictions Translate the graph of an absolute value equation
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Class assignments Class participation Teacher observation Board work Homework

Course:	Algebra I	**Grade Level:**	Grade 9, 10, 11, 12
Unit:	Systems of Equations and Inequalities	**PA Standards:**	2.1.11.A 2.2.11.A 2.4.11.E 2.5.11.B 2.5.11.C 2.5.11.D 2.8.11.A 2.8.11.D 2.8.11.E 2.8.11.I 2.8.11.K 2.8.11.N 2.8.11.S 2.8.11.T

Topics:	**Skills:**
Solving systems by graphing Solving systems using substitution Solving systems using elimination Applications of linear systems Linear inequalities Systems of linear inequalities	Solve systems by graphing Analyze special types of systems Solve systems using substitution Solve systems by adding or subtracting Multiply first when solving systems Write systems of linear equation Graph linear inequalities Use linear inequalities when modeling real-world situations Solve systems of linear inequalities by graphing Model real-world situations using systems of linear inequalities
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with finding multiple correct answers Class assignments/participation Teacher observation Board work Homework

Course: Algebra I

Unit: Exponents and Exponential Functions

Grade Level: Grade 9, 10, 11, 12

PA Standards: 2.1.11.A
2.2.11.A
2.4.11.E
2.5.11.B
2.5.11.C
2.5.11.D
2.6.11.G
2.6.11.H
2.8.11.A
2.8.11.B
2.8.11.D
2.8.11.E
2.8.11.M
2.8.11.N
2.8.11.R
2.8.11.S
2.8.11.T
2.11.11.C

Topics:	Skills:
Zero and negative exponents Scientific notation Multiplication properties of exponents More properties of exponents Division properties of exponents Geometric sequences Exponential functions Exponential growth and decay	Simplify expressions with zero and negative exponents Evaluate exponential expressions Write numbers in scientific and standard notation Use scientific notation Multiply powers Work with scientific notation Raise a power to a power Raise a product to a power Divide powers with the same base Raise a quotient to a power Use geometric sequences Use formulas when describing geometric sequences Evaluate exponential functions Graph exponential functions Model exponential growth and decay
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with multiple choices Class assignments/participation Teacher observation Board work Homework

Wallenpaupack Area School District

Course:	Algebra I	**Grade Level:**	Grade 9, 10, 11, 12
Unit:	Polynomials and Factoring	**PA Standards:**	2.1.11.A
			2.2.11.A
	10 blocks		2.5.11.D
			2.8.11.D
			2.8.11.S
			2.8.11.T

Topics:	**Skills:**
Adding and subtracting polynomials Multiplying and factoring polynomials Multiplying binomials Multiplying special cases Factoring trinomials of the type $x^2 + bx + c$ Factoring trinomials of the type $ax^2 + bx + c$ Factoring special cases Factoring by grouping	Describe polynomials Add and subtract polynomials Multiply a polynomial by a monomial Factor a monomial from a polynomial Multiply binomials using **FOIL** Multiply trinomials by binomials Find the square of a binomial Find the difference of squares Factor trinomials Factor trinomials of the type $ax^2 + bx + c$ Factor perfect-square trinomials Factor the difference of squares Factor polynomials with four terms Factor trinomials by grouping
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with eliminating answers Class assignments/participation Teacher observation Board work Homework

Course: Algebra I   **Grade Level:** Grade 9, 10, 11, 12

Unit: Radical Expressions and Equations   **PA Standards:** 2.1.11.A
2.2.11.A
2.2.11.B
2.4.11.E
2.5.11.B
2.5.11.C
2.5.11.D
2.8.11.D
2.8.11.E
2.8.11.O
2.8.11.R
2.8.11.S
2.9.11.B
2.10.11.B
2.11.11.A
2.11.11.B

Topics:	Skills:
Finding and estimating square roots Simplifying radicals The Pythagorean theorem The distance and midpoint formulas Operations with radical expressions Solving radical equations Graphing square root functions	Finding square roots Simplify radicals involving products Simplify radicals involving quotients Solve problems using the Pythagorean Theorem Identify right triangles Find the distance between two points on a coordinate plane Find the coordinates of the midpoint of a line segment Simplify sums and differences Simplify products and quotients Solve equations containing radicals Identify extraneous solutions Graph square root functions Translate graphs of square root functions
Activities:	**Performance Assessments:**
Textbook problem solving Partner work Board work Test-taking strategies	Teacher produced tests and quizzes Tests with estimation Class assignments Class participation Teacher observation Board work Homework