East Stroudsburg Area School District
Algebra I

Description: Topics to be studied are writing, solving, and graphing linear equations, functions, and inequalities in one and two variables, writing, solving, and graphing systems of linear equations and inequalities, simplifying exponential and radical expressions, equations, and functions, simplifying, factoring, and solving quadratic expressions and equations, and interpreting, analyzing, and displaying data.

Scope & Sequence

Unit 1: Solving Linear Equations

- Write, solve, and/or apply a linear equation (including problem situations).
- Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.
- Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.

Unit 2: Solving and Graphing Linear Inequalities

- Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).
- Identify or graph the solution set to a linear inequality on a number line.
- Interpret solutions to problems in the context of the problem situation. Note: Limit to linear inequalities.

Unit 3: Graphing/Writing Linear Equations, Functions, and Inequalities in Two Variables

- Write, solve, and/or apply a linear equation (including problem situations).
- Interpret solutions to problems in the context of the problem situation. Note: Limit to linear inequalities.
- Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
- Determine whether a relation is a function, given a set of points or a graph.
- Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).
- Create, interpret, and/or use the equation, graph, or table of a linear function.
- Translate from one representation of a linear function to another (i.e., graph, table, and equation).
- Identify, describe, and/or use constant rates of change.
- Apply the concept of linear rate of change (slope) to solve problems.
- Write or identify a linear equation when given:
    - Graph of the line
    - Two points on the liner
    - Slope and a point on the line

  Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.
- Determine the slope and/or *y*-intercept represented by a linear equation or graph.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.

East Stroudsburg Area School District
Algebra I

Unit 4: Solve and Graph Systems of Linear Equations and Inequalities

- Write, solve, and/or apply a linear equation (including problem situations).
- Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.
- Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.
- Write and/or solve a system of linear equations (including problem situations) using graphing, substitution, and/or elimination. Note: Limit systems to two linear equations.
- Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear equations.
- Write and/or solve a system of linear inequalities using graphing. Note: Limit systems to two linear inequalities.
- Interpret solutions to problems in the context of the problem situation. Note: Limit systems to two linear inequalities.

Unit 5: Exponents and Exponential Functions

- Compare and/or order any real numbers. Note: Rational and irrational may be mixed.
- Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$).
- Simplify/evaluate expressions involving properties/laws of exponents, roots, and/or absolute values to solve problems. Note: Exponents should be integers from -10 to 10.
- Apply the concept of linear rate of change (slope) to solve problems.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.

Unit 6: Radicals

- Create, interpret, and/or use the equation, graph, or table of a linear function.
- Translate from one representation of a linear function to another (i.e., graph, table, and equation).
- Identify, describe, and/or use constant rates of change.
- Apply the concept of linear rate of change (slope) to solve problems.
- Write or identify a linear equation when given:
    - Graph of the line
    - Two points on the line
    - Slope and a point on the line

  Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.
- Determine the slope and/or *y*-intercept represented by a linear equation or graph.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.

Unit 7: Polynomials and Factoring

- Write, solve, and/or apply a linear equation (including problem situations).
- Use and/or identify an algebraic property to justify any step in an equation-solving process. Note: Linear equations only.

- Interpret solutions to problems in the context of the problem situation. Note: Linear equations only.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
- Identify, describe, and/or use constant rates of change.
- Apply the concept of linear rate of change (slope) to solve problems.
- Write or identify a linear equation when given:
    - Graph of the line
    - Two points on the line
    - Slope and a point on the line

  Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.
- Determine the slope and/or *y*-intercept represented by a linear equation or graph.

Unit 8: Rational Expressions and Equations

- Identify, describe, and/or use constant rates of change.
- Apply the concept of linear rate of change (slope) to solve problems.
- Write or identify a linear equation when given:
    - Graph of the line
    - Two points on the line
    - Slope and a point on the line

  Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.
- Determine the slope and/or *y*-intercept represented by a linear equation or graph.

Unit 9: Data Analysis

- Identify, describe, and/or use constant rates of change.
- Apply the concept of linear rate of change (slope) to solve problems.
- Write or identify a linear equation when given:
    - Graph of the line
    - Two points on the line, or
    - Slope and a point on the line

  Note: Linear equation may be in point-slope, standard, and/or slope-intercept form.
- Determine the slope and/or *y*-intercept represented by a linear equation or graph.
- Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
- Calculate and/or interpret the range, quartiles, and interquartile range of data.

- Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.
- Analyze data, make predictions, and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots, scatter plots, measures of central tendency, or other representations).
- Make predictions using the equations or graphs of best-fit lines of scatter plots.
- Find probabilities for compound events (e.g., find probability of red and blue, find probability of red or blue) and represent as a fraction, decimal, or percent.

East Stroudsburg Area School District
Algebra I

'ellov

sl.

loads

iate

lan

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments

A1.1.2.1.1
A1.1.2.1.2
A1.1.2.1.3
	• Write, solve, and/or graph linear equations using various methods.
	  • One-step Equations
	  • Multi-step Equations
	  • Equations with Like Terms
	  • Distributive Property
	  • Equations with Variables on Both Sides
	  • Proportions
	  • Percent Equations
	  • Formulas
	  • Rational Equations
	  • Literal Equations
		• Solve one and two step equations
		• Solve real world problems
		• Solve multi-step equations
		• Solve equations by combining like terms
		• Use the Distributive Property to solve equations
		• Solve equations with variable on both sides
		• Solve equations involving rational numbers
		• Use equations to solve percent problem
		• Solve a formula
		• Create equations for real-life situations
			• Coefficient
			• Combine
			• Cross Product
			• Distribute
			• Percent
			• Proportion
			• Ratio
			• Rational
			• Solve
			• Variable
				• www.classzone.com
				• www.phschool.com
				• www.StudyIsland.com
				• https://www.thelearningodyssey.com/
				• http://www.khanacademy.org/
				• Algebra 1, Concepts and Skills, (McDougal Littell, 2004)
				• Algebra 1, (McDougal Littell, 2007)
				• Algebra 1, Prentice Hall, 2007)
				• OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010)
				• McDougal Littell & Prentice Hall teaching resources
				• Calculators
				• New and updated resources available on departmental page
					• Tests/quizzes
					• CDTs
					• Compass Learning
					• Study Island
					• Observation
					• Homework
					• Classwork
					• Projects
					• PSSA problems
					• Journals
					• Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CC.9-12.A.CED.4 Create equations that describe numbers or relationship. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

CC.9-12.A.REI.1 Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CC.9-12.A.REI.3 Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

CC.9-12.A.SSE.1a Interpret parts of an expression, such as terms, factors, and coefficients.

CC.9-12.A.SSE.1b Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret P(1+r)^n as the product of P and a factor not depending on P.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.

2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.

2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.

2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression.

c. Use models and simulations to explore complex systems and issues.

2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning
   d. Exhibit leadership for digital citizenship
6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

'ellov

:sl.

loads

ınder

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.1.3.1.1 A1.1.3.1.2 A1.1.3.1.3	• Inequalities • Number Line • One-step Inequalities • Multi-step Inequalities • Compound Inequalities • Solutions • Interpretations • Absolute Value Equations and Inequalities	• Identify solutions of inequalities • Graph and write inequalities • Use addition and subtraction to solve inequalities • Use multiplication and division to solve inequalities • Solve multi-step inequalities • Solve and graph compound inequalities • Solve equations and inequalities that involve absolute value	• Absolute value equation • Absolute value inequality • Compound inequality • Graph of an inequality • Inequality • Solution	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CC.9-12.A.REI.3 Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.

2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.

2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.

a. Plan strategies to guide inquiry
b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
d. Process data and report results

4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning
   d. Exhibit leadership for digital citizenship
6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

in Two

tions;
oint-

ultiple
odel to

loads
2.8.B.2,
.C.6

IF.2,
C.9-

'ellov
sl.

m/

lan

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.1.2.1.1 A1.1.3.1.3 A1.2.1.1.1 A1.2.1.1.2 A1.2.1.1.3 A1.2.1.2.1 A1.2.1.2.2 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.2.2.2.1	• Coordinate Plane • Graphing Linear Equations • Slope • Direct Variation • Function Rules • Domain and Range • Slope-Intercept Form • Point-Slope Form • Standard Form • Parallel Lines • Perpendicular Lines • Scatter Plot • Line of Best Fit	• Graph ordered pairs • Identify relations and functions • Evaluate functions • Model functions using rules, tables, and graphs • Write a function rule given a table or a real world situation • Identify domain and range of a function • Calculate the slope of a line • Graph the line given point and slope • Find rates of change • Use intercepts to graph equations • Write equation using slope and y intercept • Write equation given slope and a point • Write equation given two points • Use slope to determine parallel and/or perpendicular lines • Draw and/or write an equation for a line of best-fit for a scatter plot • Make predictions using the equations of graphs of best-fit lines of scatter plots	• Constant of variation • Direct variation • Domain • Function • Function notation • Line of best fit • Parallel lines • Perpendicular line • Point-slope form • Quadrant • Range • Rate of change • Relation • Scatter plot • Slope • Slope-intercept form • Standard form • Vertical line test • *x*-intercept • *y*-intercept	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CC.9-12.A.CED.2 Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CC.9-12.A.REI.10 Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

CC.9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context.

CC.9-12.F.IF.1 Understand the concept of a function and use function notation. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).

CC.9-12.F.IF.2 Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

CC.9-12.F.IF.6 Interpret functions that arise in applications in terms of the context. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.

CC.9-12.F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

CC.9-12.F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.

CC.9-12.F.IF.9 Analyze functions using different representations. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example; Given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.*

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

East Stroudsburg Area School District
Algebra I

Pennsylvania State Curriculum Standards:

2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.
2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.
2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.
2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.2.8.C.1 Define, evaluate, and compare functions.
2.2.8.C.2 Use concepts of functions to model relationships between quantities.
2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.2.HS.C.5 Construct and compare linear, quadratic and/or exponential models to solve problems.
2.4.HS.B.3 Analyze linear models to make interpretations based on the data.
2.2.HS.C.6 Interpret functions in terms of the situation they model.

ISTE Standards:

1. **Creativity and Innovation** - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results

4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning
   d. Exhibit leadership for digital citizenship
6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

'ellov

:sl.

ebra to

loads

m/

.REI.10,

late

lan

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments

A1.1.2.1.1
A1.1.2.1.2
A1.1.2.1.3
A1.1.2.2.1
A1.1.2.2.2
A1.1.3.2.1
A1.1.3.2.2
	• Systems of Two Linear Equations
	  • Graphing
	  • Substitution
	  • Elimination
	• Systems of Linear Inequalities
		• Solve a system of linear equations by:
		  • Graphing
		  • Substitution
		  • Elimination
		• Create and solve systems of equations that model real-life problems
		• Solve a system of linear inequalities by graphing
		• Create inequalities to model real-life problems
		• Identify and/or represent constraints and graph inequalities
			• Elimination
			• Infinitely many solutions
			• No solution
			• Solution of a system
			• Substitution method
			• System of linear equations
			• System of linear inequalities
				• www.classzone.com
				• www.phschool.com
				• www.StudyIsland.com
				• https://www.thelearningodyssey.com/
				• http://www.khanacademy.org/
				• Algebra 1, Concepts and Skills, (McDougal Littell, 2004)
				• Algebra 1, (McDougal Littell, 2007)
				• Algebra 1, Prentice Hall, 2007)
				• OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010)
				• McDougal Littell & Prentice Hall teaching resources
				• Calculators
				• New and updated resources available on departmental page
					• Tests/quizzes
					• CDTs
					• Compass Learning
					• Study Island
					• Observation
					• Homework
					• Classwork
					• Projects
					• PSSA problems
					• Journals
					• Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.2	Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
CC.9-12.A.CED.3	Create equations that describe numbers or relationship. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
CC.9-12.A.REI.5	Solve systems of equations. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
CC.9-12.A.REI.6	Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
CC.9-12.A.REI.7	Solve systems of equations. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x^2 + y^2 = 3.
CC.9-12.A.REI.10	Represent and solve equations and inequalities graphically. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
CC.9-12.A.REI.11	Represent and solve equations and inequalities graphically. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
CC.9-12.A.REI.12	Represent and solve equations and inequalities graphically. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
CC.9-12.N.Q.1	Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
CC.9-12.N.Q.2	Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.*
CC.9-12.N.Q.3	Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

East Stroudsburg Area School District
Algebra I

Pennsylvania Common Core Standards

2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations.
2.1.HS.F. Use units as a way to understand problems and to guide the solution of multi-step problems.
2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.
2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.
2.2.HS.D.9 Use reasoning to solve equations and justify the solution method.
2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.

a. Advocate and practice safe, legal, and responsible use of information and technology
b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
c. Demonstrate personal responsibility for lifelong learning
d. Exhibit leadership for digital citizenship

6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

Unit Title/Skill Set: Exponents and Exponential Functions

Course Time Prior to Keystone/PSSA: 10 p

Overview: Use zero and negative exponent, operations with exponents, scientific notation, and square roots.

Unit Essential Questions:

- How do you apply properties of exponents to simplify expressions?
- How do you write a number in scientific notation?
- How do you write and graph exponential functions?

PA & National Content Standard(s): *State found at www.pdesas.org/standard/standardsdownloads*
2.1.HS.F.1, 2.1.HS.F.2, 2.2.8.B.1, 2.2.8.C.1, 2.2.8.C.2, 2.2.HS.C.1, 2.2.HS.C.3, 2.2.HS.C.5, 2.4.HS.B.2, 2.4.HS.B.3, 2.2.HS.C.6

Common Core Standards:

CC.9-12.A.REI.11, CC.9-12.A.SSE.2, CC.9-12.A.SSE.3c, CC.9-12.F.IF.7e, CC.9-12.F.IF.8b, CC.9-12.N.Q.1, CC.9-12.N.Q.2, CC.9-12.N.Q.3

Connecting to Common Core and Other Standards:
Common Core found at www.corestandards.org/
ISTE found at www.iste.org/standards/nets-for-students.aspx
Career Education and Work found at www.pacareerstandards.com/

ELL Differentiation: Math and Language Arts specific found at:

www.pdesas.org/module/sas/curriculumframework/ellovverlay.aspx. Generic found at http://www.esasd.net/esl:

Enrichment:

- Internet/Research Activities
  - www.StudyIsland.com
  - https://www.thelearningodyssey.com/
  - http://www.khanacademy.org/
- Group/Research Projects

Remediation:

- Rules of exponents.
- Use order of operations to simplify and evaluate expressions and formulas.
- Classify and compare real numbers.
- Operations with rational numbers.
- Combining like terms.

IEP/GIEP: Refer to individual student's educational plan under specially designed instruction.

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.1.1.1.1 A1.1.1.1.2 A1.1.1.3.1 A1.2.2.1.2 A1.2.2.2.1	• Zero and Negative Exponents • Multiplication Properties of Exponents • Division Properties of Exponents • Scientific Notation • Square Roots	• Evaluate and simplify expressions containing zero and negative exponents • Write and use numbers in scientific notation • Multiply powers with the same base • Divide powers with the same base • Use multiplication properties of exponents • Use division properties of exponents • Evaluate and approximate square roots.	• Base • Exponent • Exponential functions • Exponential growth • Power • Scientific notation • Standard form	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizz • CDTs • Compass Learning • Study Islan • Observatio • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.REI.11 Represent and solve equations and inequalities graphically. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

CC.9-12.A.SSE.2 Interpret the structure of expressions. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

CC.9-12.A.SSE.3c Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $[1.15^{(\frac{1}{12})}]^{(12t)} \approx 1.012^{(12t)}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.

CC.9-12.F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, trigonometric functions, showing period, midline, and amplitude.

CC.9-12.F.IF.8b Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t, y = (0.97)^t, y = (1.01)^{12t}, y = (1.2)^{(\frac{t}{10})}$, and classify them as representing exponential growth and decay.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents.

2.1.HS.F.2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.

2.2.8.B.1 Apply concepts of radicals and integer exponents to generate equivalent expressions.

2.2.8.C.1 Define, evaluate, and compare functions.

2.2.8.C.2 Use concepts of functions to model relationships between quantities.

East Stroudsburg Area School District
Algebra I

2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.2.HS.C.5 Construct and compare linear, quadratic and/or exponential models to solve problems.
2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
2.4.HS.B.3 Analyze linear models to make interpretations based on the data.
2.2.HS.C.6 Interpret functions in terms of the situation they model.

ISTE Standards:

1. **Creativity and Innovation** - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning

d. Exhibit leadership for digital citizenship

6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

'ellov

:sl:

loads

.C.1,

.RN.3,

lan

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.2.1.2.1 A1.2.1.2.2 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.2.2.2.1	• Functions Involving Square Roots • Operations with Radical Expressions • Solving Radical Equations • Rational Exponents	• Evaluating square roots given a value for x • Finding the domain of a square root function • Graphing square root functions • Adding, subtracting, and multiplying radicals • Simplifying radicals • Writing radicals as rational exponents • Solve radical equations by squaring	• Domain • Function • Linear • Quadratic • Radical • Range • Rational exponents • Square root	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, (Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CC.9-12.A.CED.2 Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

CC.9-12.A.REI.1 Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CC.9-12.N.RN.1 Extend the properties of exponents to rational exponents. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 5^(1/3) to be the cube root of 5 because we want [5^(1/3)]^3 = 5^[(1/3) x 3] to hold, so [5^(1/3)]^3 must equal 5.

CC.9-12.N.RN.2 Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

CC.9-12.N.RN.3 Use properties of rational and irrational numbers. Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations.

2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.

2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.

2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems.

2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.

2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.

2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions.
2.2.HS.C.6 Interpret functions in terms of the situation they model.
2.2.8.C.1 Define, evaluate, and compare functions.
2.2.8.C.2 Use concepts of functions to model relationships between quantities.
2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.2.HS.C.5 Construct and compare linear, quadratic and/or exponential models to solve problems.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity

c. Demonstrate personal responsibility for lifelong learning
d. Exhibit leadership for digital citizenship

6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra 1

'ellov

:sl:

loads

4.HS.B.2,

.F.IF.8a,

ate

lan

East Stroudsburg Area School District
Algebra 1

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.1.2.1.1 A1.1.2.1.2 A1.1.2.1.3 A1.2.2.2.1 A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4	• Monomials • Binomials • Trinomials • Polynomials • Greatest Common Factor • Polynomial Degree • Factoring • Completing the square	• Describe polynomials • Add and subtract polynomials • Multiply a monomial and a polynomial • Factor out a monomial • Multiply two binomials • Multiply a binomial and trinomial • Find the greatest common factor • Factor quadratic expressions • Factor difference of squares • Factor perfect square trinomials • Solve quadratic equ. by factoring and completing the square	• Binomial • Coefficient • Degree • Factor • GCF • Polynomial • Quadratic • Term • Trinomial	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, (Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra 1

Common Core Standards

CC.9-12.A.APR	Perform arithmetic operations on polynomials. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
CC.9-12.A.APR.6	Rewrite rational expressions. Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.
CC.9-12.A.SSE.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
CC.9-12.A.SSE.3	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
CC.9-12.F.BF.1b	Combine standard function types using arithmetic operations. For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.
CC.9-12.F.IF.8a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
CC.9-12.N.Q.1	Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
CC.9-12.N.Q.2	Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.
CC.9-12.N.Q.3	Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.1.HS.F.3	Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs and data displays.
2.1.HS.F.4	Use units as a way to understand problems and to guide the solution of multi-step problems.
2.1.HS.F.5	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
2.2.HS.D.7	Create and graph equations or inequalities to describe numbers or relationships.
2.2.HS.D.8	Apply inverse operations to solve equations or formulas for a given variable.
2.2.HS.D.9	Use reasoning to solve equations and justify the solution method.
2.2.HS.D.10	Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
2.2.HS.C.3	Write functions or sequences that model relationships between two quantities. Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3	Write functions or sequences that model relationships between two quantities.

East Stroudsburg Area School District
Algebra 1

2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
2.2.8.C.1 Define, evaluate, and compare functions.
2.2.8.C.2 Use concepts of functions to model relationship between quantities.
2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.
2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.
2.2.HS.C.5 Construct and compare linear, quadratic and/or exponential models to solve problems.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
   b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
   d. Contribute to project teams to produce original works or solve problems
3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning

d. Exhibit leadership for digital citizenship

6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.

13.1.11.E Justify the selection of a career.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra I

'ellov

:sl:

loads

ıate

lan

East Stroudsburg Area School District
Algebra I

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4	• Rational Expressions • Rational Equations	• Simplify rational expressions by factoring • Multiply and divide rational expressions • Calculate the sum and difference of rational expressions with like and unlike denominators • Solve rational equations using cross-products and least common denominators	• Factor • Inverse Variation • Least Common Denominator • Linear • Model • Quadratic • Quantitative • Rational expression, function, equation • Simplify • Solution	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, (Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra I

Common Core Standards

CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

CC.9-12.A.REI.1 Understand solving equations as a process of reasoning and explain the reasoning. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Pennsylvania Common Core Standards:

2.2.8.C.1 Define, evaluate, and compare functions.

2.2.8.C.2 Use concepts of functions to model relationships between quantities.

2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context.

2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.

2.2.HS.C.5 Construct and compare linear, quadratic and/or exponential models to solve problems.

ISTE Standards:

1. **Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
   a. Apply existing knowledge to generate ideas, products, or processes
   b. Create original works as a means of personal or group expression
   c. Use models and simulations to explore complex systems and issues
   d. Identify trends and forecast possibilities

2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
   a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media

b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
c. Develop cultural understanding and global awareness by engaging with learners of other cultures
d. Contribute to project teams to produce original works or solve problems

3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.
   a. Plan strategies to guide inquiry
   b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
   c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
   d. Process data and report results
4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
   a. Identify and define authentic problems and significant questions for investigation
   b. Plan and manage activities to develop a solution or complete a project
   c. Collect and analyze data to identify solutions and/or make informed decisions
   d. Use multiple processes and diverse perspectives to explore alternative solutions
5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
   a. Advocate and practice safe, legal, and responsible use of information and technology
   b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
   c. Demonstrate personal responsibility for lifelong learning
   d. Exhibit leadership for digital citizenship
6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
   a. Understand and use technology systems
   b. Select and use applications effectively and productively
   c. Troubleshoot systems and applications
   d. Transfer current knowledge to learning of new technologies

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.
13.1.11.B Analyze career options based on personal interests, abilities, aptitudes, achievements and goals.
13.1.11.C Analyze how the changing roles of individuals in the workplace relate to new opportunities within career choices.
13.1.11.D Evaluate school-based opportunities for career awareness/preparation, such as, but not limited to:

- Career days
- Career portfolio

- Community service
- Cooperative education
- Graduation/senior project
- Internship
- Job shadowing
- Part-time employment
- Registered apprenticeship
- School-based enterprise

13.1.11.E Justify the selection of a career.

13.1.11.F Analyze the relationship between career choices and career preparation opportunities, such as, but not limited to:

- Associate degree
- Baccalaureate degree
- Certificate/licensure
- Entrepreneurship
- Immediate part/full time employment
- Industry training
- Military training
- Professional degree
- Registered apprenticeship
- Tech Prep
- Vocational rehabilitation centers

13.1.11.G Assess the implementation of the individualized career plan through the ongoing development of the career portfolio.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.

East Stroudsburg Area School District
Algebra 1

ınd-
ɔbability

ellov

ɜsl:

ɗata, and

loads

.9-
-

s,
ɔts.

lan

East Stroudsburg Area School District
Algebra 1

Assessment Anchors & Eligible Content	Unit Concepts What students need to know	Unit Competencies What students need to be able to do (skills)	Content Vocabulary	Materials, Resources, & Instructional Activities	Assessments
A1.2.2.1.1 A1.2.2.1.2 A1.2.2.1.3 A1.2.2.1.4 A1.2.2.2.1 A1.2.3.1.1 A1.2.3.2.1 A1.2.3.2.2 A1.2.3.2.3 A1.2.3.3.1	• Mean, median, and mode, outliers • Range • Frequency Table • Stem-and-Leaf Plot • Quartiles • Box-and-Whisker Plot • Dot Plots • Scatter Plots, Correlations, and Line of Best Fit	• Calculate mean, median, and mode, outliers • Analyze the shape of data in terms of mean, median, and mode • Find the range of a data set • Create a frequency table • Create a stem-and-leaf plot • Determine the correlation shown by a scatter plot • Write the equation for the line of best fit • Find the quartiles of a data set • Create a box-and-whisker plot	• Best Fit • Correlation • Data • Frequency • Linear Model • Mean • Median • Mode • Quartile • Range • Scatter Plot • Stem-and-Leaf	• www.classzone.com • www.phschool.com • www.StudyIsland.com • https://www.thelearningodyssey.com/ • http://www.khanacademy.org/ • Algebra 1, Concepts and Skills, (McDougal Littell, 2004) • Algebra 1, (McDougal Littell, 2007) • Algebra 1, (Prentice Hall, 2007) • OnCore Mathematics, Algebra 1, (Houghton Mifflin Harcourt, 2010) • McDougal Littell & Prentice Hall teaching resources • Calculators • New and updated resources available on departmental page	• Tests/quizzes • CDTs • Compass Learning • Study Island • Observation • Homework • Classwork • Projects • PSSA problems • Journals • Bell-ringers

East Stroudsburg Area School District
Algebra 1

Common Core Standards

CC.9-12.S.ID.1 Summarize, represent, and interpret data on a single count or measurement variable. Represent data with plots on the real number line (dot plots, histograms, and box plots).*

CC.9-12.S.ID.2 Summarize, represent, and interpret data on a single count or measurement variable. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.*

CC.9-12.S.ID.3 Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).*

CC.9-12.S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.*

CC.9-12.S.ID.5 Summarize, represent, and interpret data on two categorical and quantitative variables. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*

CC.9-12.S.ID.6 Summarize, represent, and interpret data on two categorical and quantitative variables. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.*

CC.9-12.S.ID.6a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*

CC.9-12.S.ID.6b Informally assess the fit of a function by plotting and analyzing residuals.*

CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.*

CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*

CC.9-12.S.ID.8 Interpret linear models. Compute (using technology) and interpret the correlation coefficient of a linear fit.*

CC.9-12.S.ID.9 Interpret linear models. Distinguish between correlation and causation.*

East Stroudsburg Area School District
Algebra 1

CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.*

CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.*

CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*

Pennsylvania Common Core Standards:

2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
2.4.HS.B.3 Analyze linear models to make interpretations based on the data.
2.4.HS.B.4 Recognize and evaluate random processes underlying statistical experiments.
2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.
2.4.HS.B.7 Apply the rules of probability to compute probabilities of compound events in a uniform probability model.
2.2.HS.C.6 Interpret functions in terms of the situation they model.

ISTE Standards:

1**. Creativity and Innovation** -Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.

a. Apply existing knowledge to generate new ideas, products, or processes
b. Create original works as a means of personal or group expression
c. Use models and simulations to explore complex systems and issues
d. Identify trends and forecast possibilities

2. **Communication and Collaboration** - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.

a. Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
b. Communicate information and ideas effectively to multiple audiences using a variety of media and formats
c. Develop cultural understanding and global awareness by engaging with learners of other cultures
d. Contribute to project teams to produce original works or solve problems

3. **Research and Information Fluency** - Students apply digital tools to gather, evaluate, and use information.

a. Plan strategies to guide inquiry
b. Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
c. Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
d. Process data and report results

4. **Critical Thinking, Problem Solving, and Decision Making** - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
a. Identify and define authentic problems and significant questions for investigation
b. Plan and manage activities to develop a solution or complete a project
c. Collect and analyze data to identify solutions and/or make informed decisions
d. Use multiple processes and diverse perspectives to explore alternative solutions

5. **Digital Citizenship** - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
a. Advocate and practice safe, legal, and responsible use of information and technology
b. Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
c. Demonstrate personal responsibility for lifelong learning
d. Exhibit leadership for digital citizenship

6. **Technology Operations and Concepts** - Students demonstrate a sound understanding of technology concepts, systems, and operations.
a. Understand and use technology systems
b. Select and use applications effectively and productively
c. Troubleshoot systems and applications
d. Transfer current knowledge to learning of new technologies

Career Education and Work Standards:

13.1.11.A Relate careers to individual interests, abilities, and aptitudes.
13.1.11.B Analyze career options based on personal interests, abilities, aptitudes, achievements and goals.
13.1.11.C Analyze how the changing roles of individuals in the workplace relate to new opportunities within career choices.
13.1.11.D Evaluate school-based opportunities for career awareness/preparation, such as, but not limited to:

- Career days
- Career portfolio
- Community service
- Cooperative education
- Graduation/senior project

- Internship
- Job shadowing
- Part-time employment
- Registered apprenticeship
- School-based enterprise

13.1.11.E Justify the selection of a career.

13.1.11.F Analyze the relationship between career choices and career preparation opportunities, such as, but not limited to:

- Associate degree
- Baccalaureate degree
- Certificate/licensure
- Entrepreneurship
- Immediate part/full time employment
- Industry training
- Military training
- Professional degree
- Registered apprenticeship
- Tech Prep
- Vocational rehabilitation centers

13.1.11.G Assess the implementation of the individualized career plan through the ongoing development of the career portfolio.

13.1.11.H Review personal high school plan against current personal career goals and select postsecondary opportunities based upon personal career interests.