Algebra is more than a set of procedures for manipulating symbols. Algebra provides a way to explore, analyze, and represent mathematical concepts and ideas. It can describe relationships that are purely mathematical or ones that arise in real-world phenomena and are modeled by algebraic expressions. Learning algebra helps students make connections in varied mathematical representations, mathematics topics, and disciplines that rely on mathematical relationships. Algebra offers a way to generalize mathematical ideas and relationships, which apply to a wide variety of mathematical and nonmathematical settings.

NCTM, Guiding Principles for Mathematics Curriculum and Assessment

Our goal is to use varying teaching/learning strategies in order to meet the needs of all the students and the demands of the content. These strategies include, but are not limited to, the following:

Give students a new type of problem and have students arrive at solutions individually or in groups. Then share with group to collect all the different ways to solve a problem.

Present a new problem and think, pair, share.

Give students a new type of problem together with a worked out solution and have students discover and explain, in writing and verbally, how and why the solution works.

Direct instruction – Typically direct instruction will follow some exploratory time for students to play around with a new type of problem/situation/scenario. Students' brainstorming will be the start of direct instruction, with notes and examples and information that help students make sense of the new problem and place it in the context of prior knowledge.

Have students analyze a new problem: what about it looks familiar, what about it looks new, how could they start the problem or, if they can't start, what might be involved while attacking the problem. Students share ideas in writing and verbally.

Have students use technology (graphing calculators, Geometer's Sketchpad, Graphmatica, etc) to explore functions and mathematical concepts.

Have students reflect on their learning in writing and verbally. A regular class wrap up will include asking students to write what they learned in the day's work, what questions they still have, what it reminds them of from past work, and other associations they have with the new material.

Expose students to complex problems that involve many concepts and lend themselves to a variety of solutions and strategies. These could be problems that take anywhere from 15 minutes to an hour to multiple days to solve.

Instructional goals

Nurture an appreciation for the distinct nature of mathematics as an abstract language system that is internally consistent and understood through rigorous analytical thinking skills.

Nurture an appreciation for how the analytical thinking and problem solving skills honed in mathematics is essential for students' current and future lives regardless of whether they choose a mathematical or scientific field.

Wherever possible, tie the mathematical content to other fields such as economics, literature, all the sciences, psychology, politics, etc., so that students can see the relevance and use of mathematics in other contexts.

Nurture numeracy and statistical savvy so that students may be critical consumers of statistical information in their current and future lives.

A constant goal is to achieve depth of understanding and connection, despite a much too full list of topics prescribed by the State of New York.

Nurture mathematical reasoning and analytical skills and the ways to express one's reasoning, both verbally and in writing. We want to encourage students to look for and recognize patterns, internal structure, regularities or irregularities both in "real-world" problems and in the symbolic language of mathematics. We want students to see when patterns are meaningful as opposed to when they are by chance or accidental. We want students to justify their solutions and to see why those solutions make sense.

Assessment
We plan to use both formal and informal assessments to ascertain understanding. Assessments will also be both formative and summative.

Projects – research and writing projects, statistics projects that involve gathering and analyzing data, solving and explaining solutions to complex, multi-faceted problems

Tests and quizzes

Group work – group work allows the teacher to circulate and listen in, thus giving the teacher an idea of student understanding and misconceptions.

Written descriptions of solutions to problems – students will be asked to describe their process for solving a particular problem in writing, which will give the teacher an insight into student understanding of the method being assessed.

Homework
We hope to train students to make homework a productive, reflective process. Homework is a time to practice problem solving skills and thinking processes. By providing solutions, we hope to encourage students to check their own work and work independently to find their own mistakes and identify any misunderstandings or gaps in knowledge.

New Paltz Central School District
Integrated Algebra A

Integrated Algebra A Curriculum

Units:

1. **Number Theory**
2. **Radicals**
3. **Algebraic Expressions**
4. **Factoring and Rational Expressions**
5. **Linear Equations in one Variable**
6. **Linear Equations/Inequalities: Word Problems**
7. **Linear Equations and Inequalities in Two Variables**
8. **Applied Mathematics and/or Right Triangle Relationships**
9. **Statistics**

Teacher Final Exam

Integrated Algebra B Curriculum
(Year 2)

Units:

10. **Probability/Statistics Applications**
11. **Essential Skills 1**
12. **Algebraic Fractions**
13. **Quadratic Equations**
14. **Systems of Equations**
15. **Essential Skills 2**
16. **More Functions and Relations**
17. **Essential Skills 3**
18. **Regents Preparation**

Integrated Algebra Regents

New Paltz Central School District
Integrated Algebra A

Unit 1: Number Theory

Essential Questions:

1. How is the study of set theory related to other disciplines?
2. Why is scientific notation important to science?
3. What kind of data would you use to represent absolute value?

Time	Perform Ind	Content	Lessons	Vocabulary
September (3 Weeks)	A.N.1	Identify and apply the properties of real numbers (closure, commutative, associative, distributive, identity, inverse). **Note:** Students do not need to identify groups and fields, but students should be engaged in the ideas.	**1**: Number Sets • Real, rational, irrational, integers, whole, natural • Order rational numbers **2**: Properties of Real Numbers **3**: Set Theory **4:** Set Theory **5**: Evaluate Expressions • Scientific Notation **6**: Evaluate Expressions • Absolute value • Exponents **7:** Applications **8:** Assessment	Identity Inverse Closure Commutative Associative Distributive Additive Inverse/Identity Multiplicative Inverse/Identity Reciprocal Rational Irrational Radical Approximation Set Subset Union Intersection
	A.A.29	Use set builder notation and /or interval notation to illustrate the elements of a set, given the elements in roster form.		
	A.A.30	Find the complement of a given set, within a given universe.		
	A.A. 31	Find the intersection of sets (no more than three sets) and/or union of sets (no more than three sets).		

New Paltz Central School District
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Unit 2: Radicals

Essential Questions:

1. What are the similarities between radicals and fractions?
2. When would you use simplest radical form or a rounded decimal?

Time	Perform Ind	Content	Lessons	Vocabulary
October (4 weeks)	A.N.2	Simplify radical terms **(no variable in the radicand).**	**1**: Simplify Radicals **(no variables)** **2**: Simplify Radicals **(no variables)** **3**: Multiply Radicals **4**: Divide Radicals **5**: Add/Subtract Radicals	Radical Radicand
	A.N.3	Perform the four arithmetic operations using like terms and unlike radical terms and express the result in simplest form.	**6**: Add/Subtract Radicals **7**: Radicals-All Operations **8**: Radicals-All Operations **(HW: integrated unit practice)**	
	A.N.4	Understand and use scientific notation to compute products and quotients of numbers.	**9**: Applications **10**: Assessment	

New Paltz Central School District
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Unit 3: Algebraic Expressions

Essential Questions:

1. Why do we need to convert expressions to algebraic expressions?
2. How are multiplication and division related to finding the area and volume of different geometric shapes?

Time	Perform Ind	Content	Lessons	Vocabulary
November - December (4-5 weeks)	A.A.1	Translate a quantitative verbal phrase into an algebraic expression.	**1:** Translate Verbal Expressions	Simplify Coefficient
	A.A.2	Write a verbal expression that matches a given mathematical expression.	**2:** Combine Like Terms • Add Monomials and Polynomials **3:** Combine Like Terms • Subtract Monomials and Polynomials **4:** Combine Like Terms • Add/Subtract Monomials and Polynomials	Monomial Binomial Trinomial Polynomial
	A.A.3	Distinguish the difference between an algebraic expression and an algebraic equation.	**5:** Multiply Polynomials • Distribution only monomial **6:** Multiply Polynomials • Double Distribution **7:** Multiply Polynomials • Mixed **8:** Divide Polynomials	Like Terms
	A.A .12	multiply and divide monomial expressions with a common base, using the properties of exponents.	**9:** All Operations on Polynomials **10:** Applications	
	A.A.13	Add, subtract, and multiply monomials and polynomials.	**11:** Assessment	
	A.A.14	Divide a polynomial by a monomial or binomial, where the quotient has no reminder.		

New Paltz Central School District
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Unit 4: Factoring and Rational Expressions

Essential Questions:

1. How is factoring related to quadratic functions?

Time	Perform Ind	Content	Lessons	Vocabulary
December -January (3 weeks)	A.A.19	Identify and factor the difference of two perfect squares.	**1:** Factoring • GCF **2:** Factoring • DOPS	Perfect Square Greatest Common Factor
	A.A.20	Factor algebraic expressions completely, including trinomials with a lead coefficient of one (after factoring a GCF).	**3:** Factoring • Trinomials (a=1) **4:** Factoring • Mixed factoring **5:** Factoring • Factor Completely **6:** Spiral applications with the last unit **7:** Factoring • Integrated **8:** Assessment – Midterm Exam	Undefined Standard Form

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Integrated Algebra A

Unit 5: Linear Equations in One Variable

Essential Questions:

1. How can percents describe growth over time?

Time	Perform Ind	Content	Lessons	Vocabulary
Jan.-Feb. (5 weeks)	A.A.4	Translate verbal sentences into mathematical equations or inequalities.	**1:** Solving Equations • Translate verbal equations • Combine like terms	Inverse Operation Percent Increase Percent Decrease Discount Sales Tax Rate Consecutive Even Integer Consecutive Odd Integer
	A.A.5	Write algebraic equations or inequalities that represent a situation.		
	A.A.22	Solve all types of linear equations in one variable.	**2:** Solving Equations • Distribute • Variables on both sides	
	A.A .25	Solve equations involving fractional expressions. **Note**: Expressions which result in linear equations in one variable.	**3:** Solving equations • Mixed **4:** Solving equations • Word Problems **5:** Consecutive Integer Problems **6:** Consecutive Odd/Even Integer Problems	
	A.A.6	Analyze and solve verbal problems whose solution requires solving a linear equation in one variable or linear inequality in one variable.	**7:** Word Problems • Percents (discount/tax) **8:** Percent Change **9:** Project **10:** Project **11:** Applications **12:** Assessment	

New Paltz Central School District
Integrated Algebra A

Unit 6: Linear Equations/Inequalities Word Problems

Essential Questions:

1. What strategies can be used to solve word problems?

Time	Perform Ind	Content	Lessons	Vocabulary
March-April (3 weeks)	A.A.21	Determine whether a given value is a solution to a given linear equation in one variable or linear inequality in one variable.	**1:** Solving Equations with fractions • Word Problems **2:** Word Problems • Motion **3:** Solve Inequalities • Graph number line	
	A.N.5	Solving algebraic problems arising from situations that involve fractions, decimals, percents (decrease. increase and discount), and proportionality/direct variation.	**4:** Word Problems • Money • Age **5:** Word Problems • Mixed Practice	
	8.A.14	Solve linear inequalities by combining like terms, using the distributive property, or moving variable to one side of the inequality (including multiplication or division of inequalities by negative numbers).	**6:** Spiral applications with the last unit **7:** Assessment	
	A.A.24	Solve linear inequalities in one variable.		
	8.G.19	Graph the solution set of an inequality on a number line.		
	8.G.13	Solve multi-step inequalities and graph the solution set on a number line.		

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Unit 7: Linear Equations and Inequalities in Two Variables

Essential Questions:

1. How can linear relationships be used to make decisions? (Decide, Show, Predict, Describe….)
2. How can we use linear equations to solve real-life situations?
3. How does slope represent a rate of change?

Time	Perform Ind	Content	Lessons	Vocabulary
April (3 weeks)	A.S.2	Determine whether the data to be analyzed is univariate or bivariate.	**1:** Scatter Plot • Line of Best Fit • Correlation VS Causation **2:** Linear Equations • Solutions • Slope **3:** Graphing y=mx+b • Parallel and Perpendicular Lines • Effect of Coefficients **4:** Writing Linear Equations • Parallel to x and y axis • Slope and given point • Two given points • Slope and y-intercept **5:** Graph Linear Inequalities **6:** Write Equation of Line of Best Fit in Scatter Plot **7:** Applications **8:** Assessment	Abscissa Ordinate Slope Linear Equation X and Y intercepts Correlation Causation Line of Best Fit Parallel Perpendicular
	A.S.12	Identify the relationship between the independent and dependent variables from a scatter plot of bivariate data.		
	A.S.7	Create a scatter plot of bivariate data.		
	A.S.17	Use a reasonable line of best fit to make a prediction involving interpolation or extrapolation.		
	A.S.13	Understand the difference between correlation and causation.		
	A.S.14	Identify variables that might have a correlation but not a causal relationship.		
	A.G.3	Determine when a relationship is a function, by examining ordered pairs and inspecting graphs of relations		
	8.G.13	Determine the slope of a line from a graph and explain the meaning of a slope as a constant rate of change.		
	A.A.32	Explain slope as a rate of change between dependent and independent variables.		
	8.G.15	Graph a line using a table of values.		
	A.G.4	Identify and graph linear, quadratic, absolute value, and exponential functions.		
	8.G.17	Graph a line from an equation in slope-intercept form (y=mx+b).		

	8.G.16	Determine the equation of a line given the slope and y-intercept.		
	A.G.5	Investigate and generalize how changing the coefficients of a linear function affects its graph.		
	A.A.36	Write the equation of line parallel to the x- or y-axis.		
	8.G.14	Determine the y-intercept of a line from a graph and be able to explain the y-intercept.		
	A.A.39	Determine whether a given point is on a line, given the equation of the line.		
	A.A.33	Determine the slope of a line, given the coordinates of two points on the line.		
	A.A.37	Determine the slope of a line, given its equation in any form.		
	A.A.38	Determine if two lines are parallel, given their equations in any form.		
	A.A.34	Write the equation of a line, given the slope and the coordinates of a point on the line.		
	A.A.35	Write the equation of a line, given the coordinates of two points on the line.		
	A.S.8	Construct manually a line of best fit for a scatter plot and determine the equation of that line.		
	A.G.6	Graph linear inequalities.		

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Unit 8: Applied Mathematics and /or Right Triangle Relationships

Essential Questions for this unit:

1. Why do we use units in measurement?
2. How do measurements help compare objects?
3. How are non-standard units used to measure objects?
4. How can trig be used?
5. Why do we use trig? and when?

Time	Perform Ind	Content	Lessons	Vocabulary
April-May (3 weeks)	A.M.1	Calculate rates using appropriate units.	**1:** Formulas • Perimeter • Area • Volume • Surface Area • Dimensional Analysis **2:** Pythagorean Theorem • Triples • Application to Area and Perimeter **3:** Trig Ratios **4:** Trig Ratio/ Pythagorean Theorem Applications **5:** Applications **6:** Assessment	Angle of Elevation Angle of Depression Sine Cosine Tangent Adjacent Opposite Hypotenuse
	A.M.2	Solve problems involving conversions within measurement systems, given the relationship between the units.		
	A.G.1	Find the area and/or perimeter of figures composed of polygons and, circles or sectors of circles.		
	A.G.2	Use formulas to calculate volume and surface area of rectangular solids and cylinders.		
	A.M.3	Calculate the relative error of measuring square and cubic units, when there is an error in the linear measure.		
	A.A.42	Find the sine, cosine, and tangent ratios of a right triangle, given the lengths of the sides		
	A.A.43	Determine the measure of an angle of a right triangle, given the lengths of any two sides of the triangle.		
	A.A.44	Find the measure of the side of a right triangle, given an acute angle and the length of another side.		
	A.A.45	Determine the measure of a third side of a right triangle using the Pythagorean theorem, given the lengths of any two sides.		

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Unit 9: Statistics

Essential Questions:

1. What are the similarities and differences among the measures of central tendency?
2. Analyze: How can a variety of graphs be used in business?

Time	Perform Ind	Content	Lessons	Vocabulary
May-June (2 weeks)	A.S.10	Evaluate published reports and graphs that are based on data by considering: experimental design, appropriateness of the data analysis, and the soundness of the conclusions.	**1:** Mean, median, mode, range • Word Problems **2:** Histograms • Frequency Tables • Cumulative **3:** Stem-and-Leaf Plots • Read and Analyze variety of Graphs **4:** Box-and-Whisker • Quartiles • Percentiles **5:** Applications **6:** Assessment: Final Exam	Mean Median Mode Histogram Box-and-Whisker Plot Stem-and-Leaf Plot Circle Graph Quartile Percentile Univariate Bivariate Qualitative VS Quantitative
	A.S.1	Categorize data as qualitative or quantitative.		
	A.S.3	Determine when collected data or display of data may be biased.		
	A.S.15	Identify and describe sources of bias and its effect, drawing conclusions from data.		
	A.S.4	Compare and contrast the appropriateness of different measures of central tendency for a given data set.		
	A.S.16	Recognize how linear transformations of one-variable data affect the data's mean, median, mode, and range.		
	A.S.5	Construct a histogram, cumulative frequency histogram, and a box-and-whisker plot, given a set of data.		
	A.S.9	Analyze and interpret a frequency distribution table or histogram, a cumulative frequency distribution table or histogram, or a box-and-whisker plot.		
	A.S.6	Understand how the five statistical summary (minimum, maximum, and the three quartiles) is used to construct a box-and-whisker plot.		
	A.S.11	Find the percentile rank of an item in a data set and identify the point values for the first, second, and third quartiles.		

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Unit 10: Probability

Essential Question:

1. Why is probability important in sports?
2. How is probability used to make predictions?
3. Explore: How can using probability effect making decisions?

Time	Perform Ind	Content	Lessons	Vocabulary
September (4 weeks)	A.N.7	Determine the number of possible events, using counting techniques or the Fundamental Principle of Counting.	**1.** Single Event • Vocabulary **2.** Compound Events • AND/OR/NOT	Certainty Complements Empirical Theoretical
	A.S.19	Determine the number of elements in a sample space and the number of favorable events.	**3:** Counting Principle • Sample Space • Tree Diagram	Factorial Mutually Exclusive Sample Space
	A.N.8	Determine the number of possible arrangements (permutations) of a list of items.	**4:** Probability • With replacement • Conditional probability	Permutations Combinations Dependent Event
	A.S.18	Know the definition of conditional probability and use it to solve for probabilities in finite sample spaces.	**5:** Probability • Without replacement • Conditional probability	Conditional probability
	A.S.20	Calculate the probability of an event and its complement.	**6:** Mixed Probability • Applications	Independent Event
	A.S.21	Determine the empirical probabilities based on specific sample data.	**7:** Permutations Day 1 Factorials	
	A.S.22	Determine, based on calculated probability of a set of events, if: > some or all are equally likely to occur > one is more likely to occur than another > whether or not an event is certain to happen or not to happen.	**8:** Permutations Day 2	
	A.S.23	Calculate the probability of: > a series of independent events > a series of dependent events > two mutually exclusive events > two events that are not mutually exclusive.	**9:** Applications **10:** Assessment	

New Paltz Central School District
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Unit 11: Essential Skills 1

Essential Questions:

1. How can we use algebraic equations to solve real life problems?
2. How are inequalities important in determining minimum and maximum values?

Time	Perform Ind	Content	Lessons	Vocabulary
October (3 weeks)	A.A.19	Identify and factor the difference of two perfect squares.	**1:** Factoring • GCF • DOPS	Perfect Square
	A.A.20	Factor algebraic expression completely, including trinomials with a lead coefficient of one (after factoring a GCF).	**2:** Factoring • Trinomials (a=1) • Trinomial with GCF	Greatest Common Factor
	A.A.1	Translate a quantities verbal phase into an algebraic expression.	**3:** Factoring • Word Problems	
	A.A.2	Write a verbal expression that matches a given mathematical expression.	**4:** Algebraic Expressions	
	A.A.3	Distinguish the difference between an algebraic expression and an algebraic equation.	**5:** Solving Equations • Word Problems **6:** Solving Inequalities • Compound Inequalities	
	A.A.4	Translate verbal sentences into mathematical equations or inequalities.	**7:** Graphing Inequalities	
	A.A.5	Write algebraic equations or inequalities that represent a situation.	**8:** Assessment	
	A.A.22	Solve all types of linear equations in one variable.		
	A.A.24	Solve linear inequalities in one variable.		

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Unit 12: Algebraic Fractions

Essential Questions:

1. What strategies can be used to multiply and divide algebraic fractions?
2. How is factoring related to quadratic functions?

Time	Perform Ind	Content	Lessons	Vocabulary
October-November (4 weeks)	A.A.19	Identify and factor the difference of two perfect squares.	**1:** Algebraic Fractions Day1 • Undefined • Simplify	Undefined
	A.A.20	Factor algebraic expressions completely, including trinomials with a lead coefficient of one (after factoring a GCF).	**2:** Algebraic Fractions Day2 • Undefined • Simplify	Simplify
	A.A.15	Find values of a variable for which an algebraic fraction is undefined.	**3: :** Add/Subtract Day 1 Algebraic Fractions • Monomials • Like Binomials	Monomial Binomials
	A.A .16	Simplify fractions with polynomials in the numerator and denominator by factoring both and renaming them to lowest terms.	**4:** Add/Subtract Day 2 Algebraic Fractions • Monomials • Like Binomials	
	A.A.17	Add, or subtract, fractional expressions with monomial or like binomial denominators.	**5:** Multiply/Divide Day 1 Algebraic Fractions	
	A.A.18	Multiply and divide algebraic fractions and express answers in simplest form.	**6:** Multiply/Divide Day 2 Algebraic Fractions	

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Unit 13: Quadratic Equations and Functions

Essential Questions:

1. How can we use a graph of a quadratic equation to make a prediction?
2. How do architects use quadratics?
3. What is the connection between the roots of a quadratic equation and its factors?

Time	Perform Ind	Content	Lessons	Vocabulary
December – January (5 weeks)	8.G.20	Distinguish between linear and nonlinear equations (only graphically).	**1:** Solve Quadratic Equation Graphically • Effects of coefficients-discovery	Axis of Symmetry Vertex (Max/Min) Roots Parabola
	8.G.21	Recognize the characteristics of quadratics in tables, graphs, equations, and situations.	**2:** Solve Quadratic Equation Graphically • Find vertex, axis of symmetry, roots	Calculator Terms
	A.G.4	Identify and graph quadratic functions.	**3:** Solve Quadratic Equation Graphically • Calculator • Table of Values	
	A.A.27	Understand and apply the multiplication property of zero to solve quadratic equations with integral coefficient and integral roots.	**4:** Solve Quadratic Equation Graphically • Write EQ. from graphic function	Factorable Integral Roots
	A.A.28	Understand the difference and connection between roots of a quadratic equation and factors of a quadratic equation.	**5:** Solve Quadratic Day 1 Equation Algebraically-Day 1 • Get into standard form • Algebraic Proportions	
	A.A.26	Solve algebraic proportions in one variable which result in a quadratic equation.	**6:** Solve Quadratic Equation Algebraically-Day 2 • Algebraic Proportions	
	A.A.41	Determine the vertex and axis of symmetry of a parabola, given its equation.	**7:** Solve Algebraically • Contrast Graphically	
	A.G.8	Find the roots of a parabolic function graphically. (Only integral solutions).	**8:** Word Problems	
	A.G.10	Determine the vertex and axis of symmetry of a parabola, given its graph.	**9:** Applications	
	A.A.8	Analyze and solve verbal problems that involve quadratic equations.	**10:** Assessment: Midterm Exam	

New Paltz Central School District
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Unit 14: Systems of Equations or Inequalities

Essential Questions:

1. How can the cost and revenue be described using systems of equations?
2. When would applications for systems of equations be valuable to use?

Time	Perform Ind	Content	Lessons	Vocabulary
February-March (5 weeks)	8.G.18	Solve systems of equations graphically (only linear, integral solutions, y=mx+b format, no vertical/horizontal lines)	**1:** Linear-Linear Systems Graphically • Equations • Word Problems	Point of Intersection Solution Set
	A.A.10	Solve systems of two linear equations in two variables algebraically.	**2:** Linear-Linear Systems Graphically • Inequalities • Word Problem	Elimination
	A.A.7	Analyze and solve verbal problems whose solution requires solving a system of linear equations in two variables.	**3:** Linear-Linear Systems Algebraically • Substitution	Substitution
	A.A.11	Solve a system of one linear and one quadratic equation in two variables, where only factoring is required. **Note:** ***The quadratic equation should represent a parabola and the solution(s) should be integers.***	**4:** Linear-Linear Systems Algebraically • Substitution • Word Problems	
	A.G.9	Solve systems of linear and quadratic equations graphically. **Note:** ***Only use linear and quadratic equations that lead to solutions whose coordinates are integers.***	**5:** Linear-Linear Systems Algebraically • Elimination	
	A.G.7	Graph and solve systems of linear equations and inequalities with rational coefficients in two variables.	**6:** Linear-Linear Systems Algebraically • Elimination • Word Problems	
	A.A.40	Determine whether a given point is in the solution set of a system of linear inequalities.	**7:** Practice Linear equation Problems - Mixed Word Problems	
	A.G.7	Graph and solve systems of linear equations and inequalities with rational coefficients in two variables.	**8:** Quadratic-Linear Systems • Graphically	
	A.A.40	Determine whether a given point is in the solution set of a system of linear inequalities.	**9:** Quadratic-Linear Systems • Algebraically (Factorable Solutions Only) **10:** Applications **11**: Assessment	

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Unit 15: Essential Skills 2

Essential Questions for this unit:

1. What is the difference between volume and surface area?
2. What are the determining factors in optimizing the containers used to manufacture a product?

Time	Perform Ind	Content	Lessons	Vocabulary
March-April (5 weeks)	A.A.30	Find the complement of a given set, within a given inverse.	**1:** Set Theory • Day 1	Angle of Elevation
	A.A.29	Use set builder notation and /or interval notation to represent the elements of a set, given the elements in roster form.	**2:** Set Theory • Day 2	Cosine Tangent Adjacent
	A.N.3	Perform the four arithmetic operations using like terms and unlike radical terms and express the results in simplest form.	**3:** Radicals Day 1 • All Operations	Sector Quarter-circle Semi-circle
	A.M.2	Solve problems involving conversions within measurement systems, given the relationship between the units	**4:** Radicals Day 2 • All Operations	Angle of Depression Sine
	A.G.2	Use formulas to calculate volume and surface area of rectangular solids and cylinders	**5:** Formulas • Area • Surface Area • Volume	Opposite Hypotenuse
	A.M.3	Calculate the relative error of measuring square and cubic units, when there is an error in the linear measurement.	**6:** Formulas • Shaded Area • Word problems	
	A.A.42	Find the sine, cosine, and tangent ratios of a right triangle, given the lengths of the sides.	**7:** Trigonometry • Trig Applications **8:** Trigonometry Trig Applications **9:** Statistics Day 1 **10:** Statistics Day 2 **11:** Assessment	

New Paltz Central School District
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Unit 16: More Relations and Functions

Essential Questions:

1. How can we represent increase/decrease of populations with an exponential function?
2. Investigate and explore: What other situations that will be best represented by an exponential function?

Time	Perform Ind	Content	Lessons	Vocabulary
April-May (5 weeks)	8.A.18	Determine if a relation is a function.	**1:** Determine if a relation is a function • Graphically • Equation • Table of Values	Domain Range Relation Function Exponential Growth Decay
	8.A.17	Define and use correct terminology when referring to function (domain and range).	**2:** Identifying Domain and Range	
	8.A.19	Interpret multiple representations using equation, table of values, and graph.	**3:** Introduction to Functions • Vocabulary	
	A.G.3	Determine when a relation is a function, by examining ordered pairs and inspecting graphs of functions.	**4:** Graph Absolute Value Equations	
	A.G.4	Identify and graph absolute value and exponential functions.	**5:** Verbal Problems • Exponential Growth/Decay	
	A.A.9	Analyze and solve verbal problems that involve exponential growth and decay.	**6:** Graph Exponential Functions • Writing Exp Functions **7:** Compare and Contrast all functions **8:** All Functions - emphasizes on quadratics **9:** Applications **10:** Assessment	

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Unit 17: Essential Skills 3

Essential Questions:

1. How can a graph of a system of equations be helpful in making business decisions involving cost and revenue?
2. What kind of real life situations can be best represented using linear equations?

Time	Perform Ind	Content	Lessons	Vocabulary
May-June (3 weeks)	A.S.2	Determine whether the data to be analyzed is a univariate or a bivariate.	**1:** Linear Equations • Put EQ. into standard form • Solutions	Abscissa Ordinate Slope
	A.S.12	Identify the relationship between the independent and dependent variables from a scatter plot of bivariate data.	**2:** Graphing y=mx+b • Slope Formula • Parallel and Perpendicular Lines	Linear Equation X and Y intercepts Correlation
	A.S.7	Create a scatter plot of bivariate data.	**3:** Writing Linear Equations • Slope and given point • Two given points	Causation Line of Best Fit Univariate Bivariate
	A.S.17	Use reasonable line of best fit to make a prediction involving interpolation or extrapolation.	**4:** Slope and y-intercept • Parallel and Perpendicular Lines	Parallel Perpendicular
	A.S.13	Understand the difference between correlation and causation.	**5:** Writing Linear Regressions • Graphing Line of best fit	Independent Dependent variables
	A.S.14	Identify variables that might have a correlation but not a causal relationship.	**6:** Writing Linear Inequalities	
	A.G.3	Determine when a relationship is a function, by examining ordered pairs and inspecting graphs of relations.	**7:** Writing System of Equations **8:** Applications **9:** Assessment Regents: Integrated Algebra	