

Wallenpaupack Area School District

Planned Course Curriculum Guide

Department

Math

Name of Course

Math 8 (Algebra)

Course Description:

Math 8 includes the study and application of the following topics: fundamental operations on real numbers, polynomials, factoring, fractions, inequalities, and irrational numbers. Upon completion of this course, students will take the Keystone Algebra I Exam.

Revision Date:

September 2015

Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 1: Equations and Expressions	TIMEFRAME: ½ quarter

PA COMMON CORE/NATIONAL STANDARDS:

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

CC.2.2.HS.D.9 Apply inverse operations to solve equations or formulas for a given variable.

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

CC.2.2.HS.D.10 Represent, solve, and interpret equations algebraically.

UNIT OBJECTIVES (SWBATS):

- Solve equations using the properties of equality
- Solve problems by writing and solving equations
- Solve Problems involving proportions

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Addition property of equality
- Identity
- Multiplication property of equality
- percent

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Diagnostic

- Algebra I Diagnostic Test
- CDTs

Formative

- Teacher observation
- Unit quizzes
- Unit tests
- Unit projects/investigations
- Study Island

Summative

- Final Exam
- Keystones

EVIDENCE OF MASTERY/Cut Score (PSSA/Keystone Exam)

- PSSA Proficient (1000-1107) Advanced (1108 and up)
- Keystone Proficient (1500-1545) Advanced (1546 – 1800)
- Objective Assessment Score of 70%

DIFFERENTIATED INSTRUCTION (Remediation/Extension) (Process, Product or Content)

- Appropriate accommodations based on the student's IEP/504 Plan

RESOURCES (Websites, Blogs, Videos, Whiteboard Resources, etc.):

Prentice Hall Algebra I Textbook

Key Curriculum Press Discovering Algebra An Investigative Approach Textbook

www.phschool.com

www.studyisland.com

www.keymath.com

worksheet

supplemental handouts/worksheets/websites

Coach Workbooks

PowerPoint Presentations

Calculators/graphing calculators

graph paper

SAS

May vary based on instructor, course, availability, updates

RESOURCE SPECIFIC VOCABULARY:

www.pdesas.org

Algebra I/Math 8 Glossary

Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 2: Inequalities Data Analysis	TIMEFRAME: ½ quarter

PA COMMON CORE/NATIONAL STANDARDS:

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

CC.2.2.HS.D.10 Represent, solve, and interpret inequalities algebraically and graphically.

CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.

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

CC.2.4.HS.B.3 Analyze linear models to make interpretations based on the data.

CC.2.4.HS.B.4 Recognize and evaluate random processes underlying statistical experiments.

CC.2.4.HS.B.5 Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

CC.2.4.HS.B.6 Use the concepts of independence and conditional probability to interpret data.

CC.2.4.HS.B.7 Apply the rules of probability to compute probabilities of compound events in a uniform probability model.

UNIT OBJECTIVES (SWBATS):

- Graph inequalities
- Solve inequalities in one variable
- Write inequalities to solve problems
- Use logical reasoning to solve problems
- How to use graphs to represent data
- How to find theoretical probability and experimental probability

- How to find permutations and combinations
- How to solve problems by doing simulations

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Addition property of inequality
- Conclusion
- Converse
- Graph
- Hypothesis
- Inequality
- Multiplication property of inequalities
- Conjunction
- Disjunction
- Box-and-whisker plot (five number summary)
- Combination
- Counting principal
- Dependent events
- Experimental probability
- Frequency table
- Independent events
- Line plot
- Permutation
- Population
- Quartile
- Random sample
- Range
- Sample
- Sample space
- Simulation
- Theoretical probability

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Diagnostic

- Algebra I Diagnostic Test
- CDS

Formative

- Teacher observation
- Unit quizzes
- Unit tests
- Unit projects/investigations

• Study Island
Summative • Final Exam • Keystones
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RESOURCE SPECIFIC VOCABULARY: www.pdesas.org Algebra I/Math 8 Glossary

Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 3: Linear Equations	TIMEFRAME: ½ quarter

PA COMMON CORE/NATIONAL STANDARDS: CC.2.2.8.B.3 Analyze and solve linear equations. CC.2.2.HS.D.7 Create and graph equations to describe numbers or relationships. CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities. CC.2.4.8.B.1 Analyze and/or interpret bivariate data displayed in multiple representations. CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context. CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations. CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities. CC.2.2.HS.C.5 Construct and compare linear models to solve problems. CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.
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CC.2.4.HS.B.1 Summarize, represent, and interpret data on a single count or measurement variable.
CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.
CC.2.4.HS.B.3 Analyze linear models to make interpretations based on the data.

UNIT OBJECTIVES (SWBATS):

- Learn how to graph linear equations in two variable
- Write an equation of a line
- Find the equation of a line that models given data

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Coordinate axes
- Coordinate plane
- Coordinates
- Graph of an equation
- Graph of an ordered pair
- Line of best fit
- Linear equation
- Origin
- Parallel lines
- Perpendicular lines
- Point-slope equation
- Quadrant
- Rise
- Run
- Slope slope-intercept equation
- Standard form of a linear equation
- X-axis
- X-coordinate
- Y-axis
- Y-coordinate
- Y-intercept

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Diagnostic

- Algebra I Diagnostic Test
- CDS

Formative

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- Unit quizzes
- Unit tests
- Unit projects/investigations

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Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 4: Systems of Linear Equations	TIMEFRAME: ½ quarter

PA COMMON CORE/NATIONAL STANDARDS: CC.2.1.HS.F.5 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. CC.2.2.8.B.3 Analyze and solve linear equations and pairs of simultaneous linear equations. CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships. CC.2.2.HS.D.9 Use reasoning to solve equations and justify the solution method. CC.2.2.HS.D.10 Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.
UNIT OBJECTIVES (SWBATS): • Learn how to solve systems of two equations in two variables by graphing • Solve systems of equations by the substitution and addition methods • Solve motion, digit, and coin problems using systems of equations • Solve and graph systems of linear inequalities
INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Addition method
- Consistent system of equations
- Dependent system of equations
- Inconsistent system of equations
- Boundary line
- Half-plane
- intersection

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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Algebra I/Math 8 Glossary

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COURSE: Math 8

GRADE/S: 8

UNIT 5: Exponents and Polynomials

TIMEFRAME: On-going

PA COMMON CORE/NATIONAL STANDARDS:

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

CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems.

CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.

CC.2.2.HS.D.5 Use polynomial identities to solve problems.

UNIT OBJECTIVES (SWBATS):

- Multiply, divide, and raise a power to a power using exponents
- Learn scientific notation
- Add and subtract polynomials
- Multiply monomials and polynomials

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Additive inverses
- Ascending order
- Binomial
- Coefficient
- Constant
- Degree of a polynomial
- Degree of a term
- Descending order
- Evaluating a polynomial
- Exponential notation
- FOIL
- Leading coefficient
- Leading term
- Monomial

• Polynomial • Scientific notation • Standard notation • trinomial
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Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 6: Polynomials and Factoring Spatial Thinking: Angle Relationships, Translations, Symmetry, Reflections, and	TIMEFRAME: ½ quarter

Rotations	
PA COMMON CORE/NATIONAL STANDARDS: CC.2.1.HS.F.1 Apply and extend the properties of exponents to solve problems with rational exponents. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.2 Write expressions in equivalent forms to solve problems. CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials. CC.2.2.HS.D.5 Use polynomial identities to solve problems. CC.2.3.8.A.2 Understand and apply congruence, similarity, and geometric transformations using various tools.	
UNIT OBJECTIVES (SWBATS): • Factor trinomials • Learn general strategies for factoring polynomials • Solve polynomial equations by factoring • Learn how to use properties of figures to solve problems • Learn how to classify geometric figures • Learn how to solve a problem by drawing a diagram	
INSTRUCTIONAL STRATEGIES/ACTIVITIES: • Note taking • Homework and practice • Cooperative learning (investigations/labs) • Peer interaction • Modeling • Active participation <i>May vary depending on instructor/course.</i>	
ANCHOR VOCABULARY: • Binomial expansion • Difference of two squares • Factoring by grouping • Factoring completely • Factoring polynomials • Factorization • Principle of zero products • Relatively prime • Root • Trinomial squares	
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Wallenpaupack Area School District Curriculum	
COURSE: Math 8	GRADE/S: 8
UNIT 7: Relations and Functions	TIMEFRAME: ½ marking period

PA COMMON CORE/NATIONAL STANDARDS: CC.2.2.8.C.1 Define, evaluate, and compare functions. CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities. CC.2.1.HS.F.3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays. CC.2.1.HS.F.4 Use units as a way to understand problems and to guide the solution of multi-step problems. CC.2.2.8.B.2 Understand the connections between proportional relationships, lines, and linear equations. CC.2.2.8.C.2 Use concepts of functions to model relationships between quantities. CC.2.2.HS.C.1 Use the concept and notation of functions to interpret and apply them in terms of their context. CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations. CC.2.2.HS.C.3 Write functions or sequences that model relationships between two quantities.

CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverse of functions.
CC.2.2.HS.C.6 Interpret functions in terms of the situations they model.
CC.2.4.HS.B.2 Summarize, represent, and interpret data on two categorical and quantitative variables.

UNIT OBJECTIVES (SWBATS):

- Recognize relations and functions and their graphs
- Graph and use linear and quadratic functions
- Use direct variation

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Axis of symmetry
- Constant of variation
- Direct variation
- Domain
- Function
- Function values
- Inputs

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

Diagnostic

- Algebra I Diagnostic Test
- CDS

Formative

- Teacher observation
- Unit quizzes
- Unit tests
- Unit projects/investigations
- Study Island

Summative

- Final Exam
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Algebra I/Math 8 Glossary

Wallenpaupack Area School District Curriculum

COURSE: Math 8

GRADE/S: 8

UNIT 8: Radicals

TIMEFRAME: ½ quarter

PA COMMON CORE/NATIONAL STANDARDS:

CC.2.1.8.E.1 Distinguish between rational and irrational numbers using their properties.

CC.2.1.8.E.4 Estimate irrational numbers by comparing them to rational numbers.

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

UNIT OBJECTIVES (SWBATS):

- Learn how to find square roots
- Simplify radical expressions
- Use the Pythagorean theorem to find missing lengths of a right triangle
- Solve radical equations (time permitting)

INSTRUCTIONAL STRATEGIES/ACTIVITIES:

- Note taking
- Homework and practice
- Cooperative learning (investigations/labs)
- Peer interaction
- Modeling
- Active participation

May vary depending on instructor/course.

ANCHOR VOCABULARY:

- Cube root
- Distance formula
- Division property for radicals
- Hypotenuse
- Irrational number
- Leg
- Principle square root
- Principle of squaring

- Product property for radicals
- Pythagorean theorem
- Radical equation
- Radical expression
- Radical sign
- Radicand
- Rationalizing the denominator
- Real number
- Square root

ASSESSMENTS (Diagnostic/Benchmark/Formative/Summative):

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- CDS

Formative

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