WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Algebra I- College Preparatory

Course Number: 00221

Course Prerequisites: Grade of 75% or higher in Pre-Algebra

Course Description: (Include "no final exam" or "final exam required")
This course provides an in-depth look at the foundation of algebraic theory that will be expanded in Algebra II College Preparatory, and Geometry College Preparatory and additional advanced mathematics courses (3 credits in high school are required). It uses practical problems to apply theory and connect algebra to the real world. Algebra I College Preparatory is intended for students planning on pursuing higher education, particularly those whose primary interests are in the fields that require strong background in math or science. A final exam is required. **Keystone Exams are required of all students who take an Algebra 1 course, for graduation. If this state-mandated test is not passed, remediation will be required, and students will retake the exam. The Keystone Exam is a requirement for graduation.**

Suggested Grade Level: 9

Length of Course: _____ One Semester X Two Semesters _____ Other

(Describe)

Units of Credit: 1 **(Insert *NONE* if appropriate.)**

PDE *Certification and Staffing Policies and Guidelines (CSPG)* Required Teacher Certification(s)

(Insert certificate title and CSPG#) CSPG # 50 Mathematics

Certification verified by WCSD Human Resources Department:

X Yes _____ No

Board Approved Textbooks, Software, Materials:
Title: Algebra I
Publisher: Prentice Hall
ISBN #: 0-13-201577-3
Copyright Date: 2007
Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: August 7, 2014

Date Approved: _____

Implementation Year: 2014-2015

Suggested Supplemental Materials: (List or insert **None**)
kutasoftware.com
pdesas.org

Course Standards

PA Core Standards: (List by Number and Description)
2.1 Numbers and Operations
2.2 Algebraic Concepts
2.3 Geometry
2.4 Measurement, Data, and Probability

WCSD Academic Standards: (List or **None**)
None

Industry or Other Standards: (List, Identify Source or **None**)
None

SPECIAL EDUCATION AND GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP) or Gifted Individual Education Plan (GIEP).

SPECIFIC EDUCATIONAL OBJECTIVES/CORRESPONDING STANDARDS AND ELIGIBLE CONTENT WHERE APPLICABLE

(List Objectives, PA Standards #'s, Other Standards (see samples at end))

PA Standard: 2.1 Numbers and Operations

	Performance Indicators
CC.2.1.HS.F.1	Apply and extend the properties of exponents to solve problems with rational exponents.
CC.2.1.HS.F.2	Apply properties of rational and irrational numbers to solve real-world or mathematical problems.
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.2.1.HS.F.5	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
A1.1.1.1.1	Compare and/or order any real numbers (rational and irrational may be mixed).

A1.1.1.1.2	Simplify square roots (e.g., $\sqrt{24} = 2\sqrt{6}$).
A1.1.1.2.1	Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials.
A1.1.1.3.1	Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers.)
A1.2.1.2.1	Create, interpret and/or use the equation, graph or table of a linear function.
A1.2.1.2.2	Translate from one representation of a linear function to another (i.e., graph, table, and equation).
A1.1.2.2.1	Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).
A1.1.2.2.2	Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only).
A1.1.3.1.1	Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).
A1.1.3.1.2	Identify or graph the solution set to a linear inequality on a number line.
A1.1.3.1.3	Interpret solutions to problems in the context of the problem situation (limit to linear inequalities).
A1.1.3.2.1	Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities).
A1.1.3.2.2	Interpret solutions to problems in the context of the problem situation (systems of 2 linear inequalities only).
A1.1.2.1.1	Write, solve and/or apply a linear equation (including problem situations).
A1.1.2.1.2	Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only).
A1.1.2.1.3	Interpret solutions to problems in the context of the problem situation (linear equations only).

PA Standard: 2.2 Algebraic Concepts

	Performance Indicators
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 inverses of functions.
CC.2.2.HS.C.5	Construct and compare linear, quadratic, and exponential models to solve problems.
CC.2.2.HS.C.6	Interpret functions in terms of the situations they model.
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.2.2.HS.D.6	Extend the knowledge of rational functions to rewrite in equivalent forms.
CC.2.2.HS.D.7	Create and graph equations or inequalities to describe numbers or relationships.
CC.2.2.HS.D.8	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/inequalities and systems of equations/inequalities algebraically and graphically.
A1.1.1.3.1	Simplify/evaluate expressions involving properties/laws of exponents, roots and/or absolute value to solve problems (exponents should be integers.)
A1.1.1.4.1	Use estimation to solve problems.
A1.1.1.5.1	Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial).
A1.1.1.5.2	Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is equal to 1 after factoring out all monomial factors).
A1.1.1.5.3	Simplify/reduce a rational algebraic expression.
A1.1.2.1.1	Write, solve and/or apply a linear equation (including problem situations).
A1.1.2.1.2	Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only).
A1.1.2.1.3	Interpret solutions to problems in the context of the problem situation (linear equations only).
A1.1.2.2.1	Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).
A1.1.2.2.2	Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only).
A1.1.3.1.1	Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities).
A1.1.3.1.2	Identify or graph the solution set to a linear inequality on a number line.
A1.1.3.1.3	Interpret solutions to problems in the context of the problem situation (limit to linear inequalities).
A1.1.3.2.1	Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities).
A1.1.3.2.2	Interpret solutions to problems in the context of the problem situation (systems of 2 linear inequalities only).
A1.1.1.5.2	Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is equal to 1 after factoring out all monomial factors).
A1.1.1.5.3	Simplify/reduce a rational algebraic expression.
A1.2.1.1.1	Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
A1.2.1.1.2	Determine if a relation is a function given a set of points or a graph.
A1.2.1.1.3	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.

A1.2.1.2.1	
A1.2.1.2.2	Translate from one representation of a linear function to another (i.e., graph, table, and equation).
A1.2.2.2.1	Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.

PA Standard: 2.3 Geometry

	Performance Indicators
A1.1.3.2.2	Interpret solutions to problems in the context of the problem situation (systems of 2 linear inequalities only).
A1.2.2.1.1	Identify, describe and/or use constant rates of change.
A1.2.2.1.2	Apply the concept of linear rate of change (slope) to solve problems.
A1.2.2.1.3	Write or identify a linear equation when given • the graph of the line • 2 points on the line, or • the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form).
A1.2.2.1.4	Determine the slope and/or y-intercept represented by a linear equation or graph.

PA Standard: 2.4 Measurement, Data, and Probability

	Performance Indicators
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.7	Apply the rules of probability to compute probabilities of compound events in a uniform probability model.
A1.2.1.1.1	Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.
A1.2.1.1.2	Determine if a relation is a function given a set of points or a graph.
A1.2.1.1.3	Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).
A1.2.1.2.1	Create, interpret and/or use the equation, graph or table of a linear function.

A1.2.1.2.2	Translate from one representation of a linear function to another (i.e., graph, table, and equation).
A1.2.2.2.1	Draw, identify, find, and/or write an equation for a line of best fit for a scatter plot.
A1.2.3.1.1	Calculate and/or interpret the range, quartiles and interquartile range of data.
A1.2.3.2.1	Estimate or calculate to make predictions based on a circle, line, bar graph, measures of central tendency, or other representations.
A1.2.3.2.2	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).
A1.2.3.2.3	Make predictions using the equations or graphs of best-fit lines of scatter plots.
A1.2.3.3.1	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.

ASSESSMENTS

PSSA Assessment Anchors Addressed: The teacher must be knowledgeable of the PDE Assessment Anchors and/or Eligible Content and incorporate them into this planned instruction. Current assessment anchors can be found at pde@state.pa.us.

Formative and Summative Assessments: The teacher will develop and use standards-based assessments throughout the course.

Suggested Assessments (but not limited to):
Observations
Evaluate written work
Performance assessment
Tests
Quizzes
Evaluate oral response
Self-evaluation
Cooperative Learning
Homework
Classroom Diagnostic Tool

Portfolio Assessment: _____ Yes __X__ No

District-wide Final Examination Required: __X__ Yes _____ No

Course Challenge Assessment (Describe):
Course challenge assessment will be based on activities and exams that measure student proficiency as the course standards at 84%.

REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

Content Sequence

Variables, Functions, Patterns, Graphs

Properties of Real Numbers

Solving Linear Equations and Linear Inequalities

Graphs and Functions

Linear Equations: Forms and Graphs

Solving and Graphing Systems of Linear Equations and Inequalities

Exponents and Exponential Functions

Polynomials and Factoring

Radical Expressions and Equations

Probability and Statistics

Algebra 2 Preparation

• **Refer to Course Map on Performance Plus for Additional Information**

Objectives:

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

WRITING TEAM: Warren County School District Math Teachers

WCSD STUDENT DATA SYSTEM INFORMATION

1. Is there a required final examination? X Yes _____ No
2. Does this course issue a mark/grade for the report card? X Yes _____ No
3. Does this course issue a Pass/Fail mark? _____ Yes X No
4. Is the course mark/grade part of the GPA calculation? X Yes _____ No
5. Is the course eligible for Honor Roll calculation? X Yes _____ No
6. What is the academic weight of the course?

   _____ No weight/Non credit X Standard weight

   _____ Enhanced weight (Describe)