WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

# COURSE DESCRIPTION

## Course Title: Algebra I – College Preparatory

**Course Number:**

**Course Prerequisites:**  This course is designed for the student who has passed Pre-Algebra 8 with a 75% or higher.

Course Description: (Include “no final exam” or “final exam required”)

CP Algebra I is the first course in a three-year sequence of CP Algebra I, CP Algebra II, and CP Geometry. This course provides an in-depth look at the foundation of algebraic theory that will be expanded in CP Algebra II, and CP Geometry. It uses practical problems to apply theory and connect algebra to the real world. CP Algebra I 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. Students must have earned a grade of 75% or higher in Pre-Algebra 8 or Algebra I Grade 8 (NC or Advanced). A final exam is required.

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#) Mathematics CSPG #50

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: Spring 2012

 Date Approved:

 Implementation Year: 2012-2013

Suggested Supplemental Materials: (List or insert None) None

Course Standards

PA Academic Standards: (List by Number and Description)

2.1.11 Numbers, Number Systems, and Number Relationships

2.2.11 Computation and Estimation (Integrated throughout)

2.3.11 Measurement and Estimation

2.4.11 Mathematical Reasoning and Connection (Integrated throughout)

2.5.11 Mathematical Problem Solving and Communication (Integrated throughout)

2.6.11 Statistics and Data Analysis

2.7.11 Probability and Predictions

2.8.11 Algebra and Functions

WCSD Academic Standards: (List or None)

None

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

**Common Core**

Domains:

 The Real Number System

 Quantities

 Seeing Structure and Expressions

 Arithmetic with Polynomials and Rational Expressions

 Creating Equations

 Reasoning with Equations and Inequalities

 Interpreting Functions

 Building Functions

 Linear, Quadratic, and Exponential Models

 Interpreting Categorical and Quantitative Data

 Making Inferences and Justifying Conclusions

 Conditional Probability and the Rules of Probability

 Using Probability to Make Decisions

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: 2.1.11 Numbers, Number Systems, and Number Relationships

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|  | **Performance Indicators** |
| M11.A.1.1.1 | Find the square root of an integer to the nearest tenth using either a calculator or estimation. |
| M11.A.1.1.2 | Express numbers and/or simplify expressions using scientific notation (including numbers less than 1). |
| M11.A.1.3.1 | Locate/identify irrational numbers at the approximate location on a number line. |
| M11.A.2.1.1 | Solve problems using operations with rational numbers including rates and percents (single and multi-step and multiple procedure operations) (e.g., **distance, work and mixture problems,** etc.) |
| M11.A.2.1.2 | Solve problems using direct and inverse proportions. |
| M11.A.2.1.3 | Identify and/or use proportional relationships in problem solving settings. |
| M11.A.3.1.1 | Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). |

PA Standard: 2.3.11 Measurement and Estimation

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|  | **Performance Indicators** |
| M11.B.2.2.4 | Find the measurement of a missing length given the perimeter, circumference, area or volume |

PA Standard: 2.8.11 Algebra and Functions

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|  | **Performance Indicators** |
| A1.1.1.4.1 | Use estimation to solve problems.  |
| A1.1.1.1.2 | Simplify square roots (e.g., √24 = 2√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.) |
| A1.1.1.5.1 | 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 ax2+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). |
| A1.2.2.1.1 | **(Review)**  Identify, describe and/or use constant rates of change.  |
| A1.2.2.1.2   | **(Review)** Apply the concept of linear rate of change (slope) to solve problems.  |

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| 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).  |
| M11.D.1.1.3  | Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table).  |
| A1.1.1.1.1  | (Review) Compare and/or order any real numbers (rational and irrational may be mixed).  |
| A1.2.1.1.1  | Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.  |
| A1.2.1.2.2  | Translate from one representation of a linear function to another (graph, table and equation). |
| 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. |

PA Standard: 2.6.11 Statistics and Data Analysis

 2.7.11 Probability and Predictions

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|  | **Performance Indicators** |
| M11.E.3.1.1 | Find probabilities for independent, dependent or compound events and represent as a fraction, decimal or percent). |
| M11.E.3.1.2  | **(Review)**  Find, convert and/or compare the probability and/or odds of a simple event.  |
| M11.E.3.2.1  | **(Review)** Determine the number of permutations and/or combinations or apply the fundamental counting principle. (Formula provided on the reference sheet).  |
| M11.E.2.1.1  | Calculate or select the appropriate measure of central tendency (mean, mode or median) of a set of data given or represented on a table, line plot or stem-and-leaf plot.  |
| M11.E.4.1.2  | Use probability to predict outcomes.  |
| 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. |
| M11.E.1.1.1 | Create and/or use appropriate graphical representations of data, including box-and-whisker plots, stem-and-leaf plots or scatter plots. |
| M11.E.2.1.3 | Describe how outliers affect measures of central tendency. |
| 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. |

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):

Not applicable

# REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

###  Content Sequence Dates

1. Variables, Functions, Patterns, Graphs August/September
2. Properties of Real Numbers and Simplify Square Roots September
3. Solving Linear Equations October
4. Solving Linear Inequalities November
5. Graphs and Functions (direct and inverse) December
6. Linear Equations: Forms and Graphs January
7. Systems and Equations and Inequalities February
8. Exponents and Exponential Functions March
9. Polynomials and Factoring April
10. Probability and Statistics May/June

**Objectives:**

Students will:

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:** WCSD 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

1. 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)