WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Pre-Algebra 8

Course Number: 00201

Course Prerequisites: Completion of Mathematics – Grade 7, 60% year average and basic operations without calculator usage.

Course Description: This course builds upon computational, problem solving, graphing, and algebraic concepts previously learned in mathematics. Pre-algebra provides learning experiences required for algebra I such as functioning, graphing, absolute value, permutations and combinations, systems of equations and inequalities. It will provide students with problem-solving, reasoning skills and mathematical concepts necessary to be successful learners in future mathematics courses.

Suggested Grade Level: 8

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

(Describe)

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

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

(Insert certificate title and CSPG#) CSPG # 50 Mathematics or CSPG # 53 Middle Level Mathematics

Certification verified by WCSD Human Resources Department:

x Yes _____ No

Board Approved Textbooks, Software, Materials:
Title: Pre-Algebra
Publisher: Glencoe McGraw-Hill
ISBN #: 978-0-07-873818-0
Copyright Date: 2008
Date of WCSD Board Approval:

BOARD APPROVAL:

Date Written: 08/29/2013

Date Approved: _____

Implementation Year: 2014-2015

Suggested Supplemental Materials: (List or insert **None**) Textbook resources, Kuta Software

Course Standards

PA Academic Standards:

2.1 Numbers and Operations
2.2 Algebraic Concepts
2.3 Geometry
2.4 Measurement, Data, and Probablity

WCSD Academic Standards: None

Industry or Other Standards: Common Core Standards

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.2.1.8.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.

.NS	The Number System ~ Know that there are numbers that are not rational, and approximate them by rational numbers.
8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

PA Standard: 2.2 Algebraic Concepts

	Performance Indicators
CC.2.2.8.B.1	Apply concepts of radicals and integer exponents to generate equivalent expressions.
CC.2.2.8.B.2	Understand the connections between proportional relationships, lines, and linear equations.
CC.2.2.8.B.3	Analyze and solve linear equations and pairs of simultaneous linear equations.
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.

8.EE	Expressions & Equations ~ Expressions and Equations work with radicals and integer exponents; Understand the connections between proportional relationships, lines, and linear equations.; Analyze and solve linear equations and pairs of simultaneous linear equations.
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes.
8.EE.3	Use numbers expressed in the form of a single digit times a whole-number power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.
8.EE.5	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.
8.EE.8	Analyze and solve pairs of simultaneous linear equations.
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no

	solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
8.EE.8a	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
8.EE.8b	Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
8.EE.8c	Solve real-world and mathematical problems leading to two linear equations in two variables.

8.F	Functions ~ Define, evaluate, and compare functions. Use functions to model relationships between quantities.
8.F.1	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1
8.F.2	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
8.F.3	Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.
8.F.4	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.
8.F.5	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

PA Standard: Geometry

Performance Indicators	
CC.2.3.8.A.1	Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems
CC.2.3.8.A.2	Understand and apply congruence, similarity, and geometric transformations using various tools.
CC.2.3.8.A.3	Understand and apply the Pythagorean Theorem to solve problems.

8.G	Geometry ~ Understand congruence and similarity using physical models, transparencies, or geometry software. Understand and apply the Pythagorean Theorem.; Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
8.G.9	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
8.G.1a	Lines are taken to lines, and line segments to line segments of the same length.
8.G.1b	Angles are taken to angles of the same measure.

8.G.1c	Parallel lines are taken to parallel lines.

PA Standard: Measurement, Data, and Probability

Performance Indicators	
CC.2.4.8.B.1	Analyze and/or interpret bivariate data displayed in multiple representations.
CC.2.4.8.B.2	Understand that patterns of association can be seen in bivariate data utilizing frequencies.

8.SP	Statistics & Probability ~ Investigate patterns of association in bivariate data.
8.SP.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.SP.2	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.SP.3	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.
8.SP.4	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

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

Portfolio Assessment: _____ Yes __x__ No

District-wide Final Examination Required: __x__ Yes _____ No

Course Challenge Assessment (Describe):
None

REQUIRED COURSE SEQUENCE AND TIMELINE

(Content must be tied to objectives)

Content Sequence	Dates
See Curriculum Map	

WRITING TEAM: 8th Grade 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
4. Is the course mark/grade part of the GPA calculation? _____ Yes __x__ No
5. Is the course eligible for Honor Roll calculation? __x__ Yes _____ No
6. What is the academic weight of the course?

   __x__ No weight/Non credit _____ Standard weight

   _____ Enhanced weight (Describe)