WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Algebra Concepts
Course Number: 00206
Course Prerequisites: Completion of Grade 8 with a grade less than 60%; teacher recommendation is required to enroll in this course.

Course Description: The Algebra Concepts course builds upon computational, problem solving, graphing, and algebraic concepts previously learned in mathematics. Algebra Concepts provides learning experiences required for Algebra I such as linear equations, functions, graphing, geometry, systems of equations, and bivariate data. It will provide students with problem-solving, reasoning skills, and mathematical concepts necessary to be successful learners in future mathematics courses. Teacher recommendation is required to enroll in the class. District marking period assessments are required.

Suggested Grade Level: Grades 9-12
Length of Course: Two Semesters
Units of Credit: 1
PDE Certification and Staffing Policies and Guidelines (CSPG) Required Teacher Certifications:
CSPG #50 Mathematics (7-12)
To find the CSPG information, go to CSPG
Certification verified by the WCSD Human Resources Department: ☒Yes ☐No

WCSD STUDENT DATA SYSTEM INFORMATION

Course Level: Academic
Mark Types: Check all that apply.
☒F – Final Average ☒MP – Marking Period ☒EXM – Final Exam

GPA Type: ☐ GPAEL-GPA Elementary ☐ GPAML-GPA for Middle Level ☒ NHS-National Honor Society
☒ UGPA-Non-Weighted Grade Point Average ☒ GPA-Weighted Grade Point Average

State Course Code: 02051
To find the State Course Code, go to State Course Code, download the Excel file for *SCED*, click on SCED 6.0 tab, and choose the correct code that corresponds with the course.

TEXTBOOKS AND SUPPLEMENTAL MATERIALS

Board Approved Textbooks, Software, and Materials:

Title:	*enVisionmath 2.0 Grade 8*
Publisher:	SAVVAS Learning Company LLC.
ISBN #:	978-0-32895-258-8
Copyright Date:	2017
WCSD Board Approval Date:	6/29/2020

Supplemental Materials: Kuta Software, Get More Math, SAS pdesas.org, IXL, Brainfuse, Calculator: TI-30XIIS, Online Calculator: Desmos

Curriculum Document

WCSD Board Approval:

Date Finalized:	5/23/2022
Date Approved:	6/13/2022
Date(s) Revised:	6/12/2023
Implementation Year:	2022-2023

SPECIAL EDUCATION, 504, and GIFTED REQUIREMENTS

The teacher shall make appropriate modifications to instruction and assessment based on a student's Individual Education Plan (IEP), Chapter 15 Section 504 Plan (504), and/or Gifted Individual Education Plan (GIEP).

SCOPE AND SEQUENCE OF CONTENT, AND CONCEPTS

Marking Period 1: Real Numbers and Linear Equations

- Rational Numbers
- Irrational Numbers
- Comparison and Order of Real Numbers
- Evaluation of Square Roots and Cube Roots
- Equations Involving Square Roots and Cube Roots
- Properties of Integer Exponents
- Estimation of Quantities Using Powers of 10
- Scientific Notation: Conversions, Operations
- Combination of Like Terms: Decimal, Fraction, Negative
- Equations: Variables on Both Sides, Multi-Step
- Equation Solutions: One, No, Infinitely Many
- **Marking Period 1 Review and Assessment**

Marking Period 2: Linear Equations and Functions to Model Relationships

- Comparison of Proportional Relationships
- Connection of Proportional Relationships and Slope
- Analysis of Linear Equations: $y = mx$ (Slope), $y = mx + b$ (Slope and Intercept)
- Comparison and Interpretation of Relations and Functions
- Representations of Functions through Various Models
- Comparison of Linear and Non-Linear Functions
- Construction of Functions to Model Linear Relationships
- Analysis of Qualitative Graphs: Increase, Decrease
- Linear and Non-Linear Functions: Creation of Sketches, Analysis of Sketches
- **Marking Period 2 Review and Assessment**

Marking Period 3: Bivariate Data, Systems of Linear Equations, and Congruence

- Scatter Plots: Construction and Interpretation, Analysis of Linear Associations, Predictions with Linear Models
- Construction and Interpretations of Two-Way Frequency Tables
- Construction and Interpretations of Two-Way Relative Frequency Tables
- Systems of Linear Equations - Estimations of Solutions: One, No, Infinitely Many
- Systems of Linear Equations: Graphing, Substitution, Elimination
- Translations
- Reflections
- Rotations
- **Marking Period 3 Review and Assessment**

Marking Period 4: Congruence and Similarity, Pythagorean Theorem, Geometry: Surface Area and Volume

- Composition of Transformations
- Congruent Figures
- Dilations
- Similar Figures
- Pythagorean Theorem and It's Converse
- Application of the Pythagorean Theorem
- Distance in the Coordinate Plane
- Surface Area of Three-Dimensional Figures
- Volume of Three-Dimensional Figures
- **Marking Period 4 Review and Assessment**

Standards/Eligible Content and Skills

Performance Indicator	PA Core Standard and/or Eligible Content	Marking Period Taught
Write repeating decimals as fractions	M08.A-N.1.1.2	MP1
Write repeating decimals with non-repeating digits as fractions	M08.A-N.1.1.2	MP1
Write repeating decimals with multiple repeating digits as fractions	M08.A-N.1.1.2	MP1
Identify irrational numbers	M08.A-N.1.1.1	MP1
Identify square roots and irrational numbers	M08.A-N.1.1.1	MP1
Classify numbers as rational or irrational	M08.A-N.1.1.1	MP1
Estimate the value of an irrational number	M08.A-N.1.1.3	MP1
Compare and order rational and irrational numbers	M08.A-N.1.1.4	MP1
Locate/identify rational and irrational numbers at their approximate locations on a number line	M08.A-N.1.1.5	MP1
Evaluate perfect squares and perfect cubes	M08.B-E.1.1.2 CC.2.2.8.B.1	MP1
Evaluate square roots and cube roots to solve problems	M08.B-E.1.1.2 CC.2.2.8.B.1	MP1
Solve equations involving perfect squares and perfect cubes	M08.B-E.1.1.2 CC.2.2.8.B.1	MP1
Solve equations involving imperfect squares and cubes	M08.B-E.1.1 CC.2.2.8.B.1	MP1
Multiply exponential expressions: Same Base, Different Base	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Find the power of a power	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Divide exponential expressions: Same Base	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Use the Zero Exponent Property	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Use the Negative Exponent Property	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Simplify expressions with negative exponents	M08.B-E.1.1.1 CC.2.2.8.B.1	MP1
Estimate very large and very small quantities	M08.B-E.1.1.3	MP1
Express how many times larger or smaller one number is than another	M08.B-E.1.1.3	MP1
Write large and small numbers in scientific notation	M08.B-E.1.1.3	MP1
Convert scientific notation to standard form	M08.B-E.1.1.4	MP1
Perform operations with numbers expressed in scientific notation: Addition, Subtraction, Multiplication, Division	M08.B-E.1.1.4	MP1
Combine like terms to solve addition and subtraction equations	M08.B-E.3.1.2	MP1
Combine like terms with negative coefficients to solve equations	M08.B-E.3.1.2	MP1
Solve equations: Fractional Coefficients, Decimal Coefficients, Negative Coefficients	M08.B-E.3.1.2	MP1
Use the Distributive Property to solve a multi-step equation	M08.B-E.3.1.2	MP1
Distribute a negative coefficient to solve equations	M08.B-E.3.1.2	MP1

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Solve using the Distributive Property on both sides of an equation	M08.B-E.3.1.2	MP1
Solve an equation: One solution, No solution, Infinitely many solutions	M08.B-E.3.1.1	MP1
Determine the number of solutions by inspection	M08.B-E.3.1.1	MP1
Solve real-world and mathematical problems of linear equations	M08.B-E.3.1.2	MP1
Marking Period 1 Review and Assessment		**MP1**
• Review and demonstrate knowledge of Real Numbers		MP1
• Review and demonstrate knowledge of Linear Equations		MP1
Compare proportional relationships represented by tables and graphs	M08.B-E.2.1.1	MP2
Compare proportional relationships represented by graphs and equations	M08.B-E.2.1.1	MP2
Compare proportional relationships represented by graphs and verbal descriptions	M08.B-E.2.1.1	MP2
Understand slope	M08.B-E.2.1.1	MP2
Find the slope from two points	M08.B-E.2.1.2	MP2
Interpret slope	M08.B-E.2.1.1	MP2
Relate the constant of proportionality to slope	M08.B-E.2.1.1	MP2
Write a linear equation from two points	M08.B-E.2.1.2	MP2
Graph an equation of the forms: y = mx, y = mx + b	M08.B-E.2.1.3	MP2
Determine the y-intercept of a relationship	M08.B-E.2.1.3	MP2
Understand the y-intercept of a proportional relationship	M08.B-E.2.1.3	MP2
Identify the y-intercept	M08.B-E.2.1.3	MP2
Write the equation of a line	M08.B-E.2.1.3	MP2
Write a linear equation given a graph	M08.B-E.2.1.3	MP2
Graph a linear equation	M08.B-E.2.1.3	MP2
Identify functions with arrow diagrams	M08.B-F.1.1.1	MP2
Use tables to identify functions	M08.B-F.1.1.1	MP2
Interpret functions	M08.B-F.1.1 M08.B-F.1.1.3	MP2
Represent a linear function with an equation and a graph	M08.B-F.2.1.1	MP2
Represent a nonlinear function with a graph	M08.B-F.2.1.1	MP2
Identify functions from graphs	M08.B-F.2.1.1	MP2
Compare two linear functions	M08.B-F.1.1.2	MP2
Compare a linear and nonlinear function	M08.B-F.1.1.2	MP2
Compare properties of linear functions	M08.B-F.1.1.2	MP2
Write a function from a graph	M08.B-F.2.1.1	MP2
Write a function from two values	M08.B-F.2.1.1	MP2
Interpret a function from a graph	M08.B-F.2.1.1	MP2
Interpret a qualitative graph	M08.B-F.2.1.2	MP2
Interpret the graph of a nonlinear function	M08.B-F.2.1.2	MP2
Describe the relationship of quantities	M08.B-F.2.1.2	MP2
Sketch the graph of a linear function	M08.B-F.2.1.2	MP2
Sketch and analyze the graph of a nonlinear function	M08.B-F.2.1.2	MP2

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Marking Period 2 Review and Assessment		**MP2**
• Review and demonstrate knowledge of Linear Equations to Model Relationships		MP2
• Review and demonstrate knowledge of Functions to Model Relationships		MP2
Construct a scatter plot	M08.D-S.1.1.1	MP3
Interpret a scatter plot: Positive Correlation, Negative Correlation, No Correlation	M08.D-S.1.1.1	MP3
Analyze linear associations with a line of best fit, clustering, and outliers	M08.D-S.1.1.1 M08.D-S.1.1.2	MP3
Analyze the strength of linear associations: Weak, Strong	M08.D-S.1.1.1	MP3
Recognize nonlinear associations	M08.D-S.1.1.1	MP3
Use the slope to make a prediction	M08.D-S.1.1.3	MP3
Use scatter plots to make a prediction	M08.D-S.1.1.3	MP3
Interpret the slope and y-intercept	M08.D-S.1.1.3	MP3
Construct and interpret a two-way frequency table	M08.D-S.1.2 M08.D-S.1.2.1 CC.2.4.8.B.2	MP3
Construct a two-way relative frequency table	M08.D-S.1.2 M08.D-S.1.2.1 CC.2.4.8.B.2	MP3
Compare relative frequency by rows and columns	M08.D-S.1.2 M08.D-S.1.2.1 CC.2.4.8.B.2	MP3
Relate solutions of linear systems	M08.B-E.3.1.3	MP3
Estimate solutions of systems of linear equations by inspection	M08.B-E.3.1.3 M08.B-E.3.1.4	MP3
Graph a system of linear equations: One Solution, No Solution, Infinitely Many Solutions	M08.B-E.3.1.3 M08.B-E.3.1.4	MP3
Solve a system of linear equations by substitution: One Solution, No Solution, Infinitely Many Solutions	M08.B-E.3.1.4	MP3
Solve a system of linear equations by elimination: Addition, Subtraction, Multiplication	M08.B-E.3.1.4	MP3
Solve real-world and mathematical problems leading to two linear equations in two variables	M08.B-E.3.1.5	MP3
Understand translations	M08.C-G.1.1.1	MP3
Translate a figure on a coordinate plane	M08.C-G.1.1.1	MP3
Describe the effect of a translation of a two-dimensional figure using coordinates	M08.C-G.1.1.3	MP3
Understand reflections	M08.C-G.1.1.1	MP3
Reflect a figure on a coordinate plane	M08.C-G.1.1.1	MP3
Describe the effect of a reflection of a two-dimensional figure using coordinates	M08.C-G.1.1.3	MP3
Understand rotations	M08.C-G.1.1.1	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Rotate a figure on a coordinate plane	M08.C-G.1.1.1	MP3
Describe the effect of a rotation of a two-dimensional figure using coordinates	M08.C-G.1.1.3	MP3
Marking Period 3 Review and Assessment		**MP3**
• Review and demonstrate knowledge of Bivariate Data		MP3
• Review and demonstrate knowledge of Systems of Linear Equations		MP3
• Review and demonstrate knowledge of Congruence		MP3
Understand a sequence of transformations on a coordinate plane	M08.C-G.1.1.1	MP4
Perform a sequence of transformations on a coordinate plane	M08.C-G.1.1.1	MP4
Describe the effect of a sequence of transformations of a two-dimensional figure using coordinates	M08.C-G.1.1.2	MP4
Understand congruence	M08.C-G.1.1.2 CC.2.3.8.A.2	MP4
Identify congruent figures	M08.C-G.1.1.2 CC.2.3.8.A.2	MP4
Understand dilations	M08.C-G.1.1.3	MP4
Dilate a figure on a coordinate plane	M08.C-G.1.1.3	MP4
Describe the effect of a dilation of a two-dimensional figure using coordinates	M08.C-G.1.1.3	MP4
Understand similarity	M08.C-G.1.1.4	MP4
Identify similar figures	M08.C-G.1.1.4	MP4
Perform a similarity transformation on a coordinate plane	M08.C-G.1.1.4	MP4
Understand and apply congruence, similarity, and geometric transformations using various tools	CC.2.3.8.A.2	MP4
Understand the Pythagorean Theorem	CC.2.3.8.A.3	MP4
Use the Pythagorean Theorem to find missing angles in a right triangle	M08.C-G.2.1 M08.C-G.2.1.2	MP4
Understand the converse of the Pythagorean Theorem	M08.C-G.2.1.1	MP4
Apply the converse of the Pythagorean Theorem to show a triangle is a right triangle	M08.C-G.2.1.1	MP4
Solve real-world and mathematical problems applying the Pythagorean Theorem	M08.C-G.2.1 M08.C-G.2.1.2 CC.2.3.8.A.3	MP4
Solve real-world and mathematical problems applying the converse of the Pythagorean Theorem	M08.C-G.2.1.1	MP4
Apply the Pythagorean Theorem to find lengths of triangles in three dimensions	M08.C-G.2.1.2 CC.2.3.8.A.3	MP4
Apply the Pythagorean Theorem to find the perimeter of a triangle in a coordinate plane	M08.C-G.2.1.2 M08.C-G.2.1.3 CC.2.3.8.A.3	MP4
Apply the Pythagorean Theorem to problem solve on a coordinate plane	M08.C-G.2.1.2 M08.C-G.2.1.3 CC.2.3.8.A.3	MP4

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Find the surface area: Cylinders, Cones, Spheres	M08.C-G.3.1.1	MP4
Solve real-world and mathematical problems involving surface area	M08.C-G.3.1.1	MP4
Relate the volumes of rectangular prisms and cylinders	M08.C-G.3.1.1	MP4
Find the unknown measure of a cylinder	M08.C-G.3.1.1	MP4
Solve real-world and mathematical problems involving the volume of a cylinder	M08.C-G.3.1.1 CC.2.3.8.A.1	MP4
Relate the volumes of cones and spheres	M08.C-G.3.1.1	MP4
Find the volume: Cones, Spheres, Composite Figures	M08.C-G.3.1.1	MP4
Apply the concepts of volume of cylinders, cones, and spheres to solve real-world and mathematical problems	CC.2.3.8.A.1	MP4
Marking Period 4 Review and Assessment		**MP4**
• Review and demonstrate knowledge of Congruence and Similarity		MP4
• Review and demonstrate knowledge of the Pythagorean Theorem		MP4
• Review and demonstrate knowledge of Geometry: Surface Area and Volume		MP4

ASSESSMENTS

PDE Academic Standards, Assessment Anchors, and Eligible Content: The teacher must be knowledgeable of the PDE Academic Standards, Assessment Anchors, and Eligible Content and incorporate them regularly into planned instruction.

Formative Assessments: The teacher will utilize a variety of assessment methods to conduct in-process evaluations of student learning.

Effective formative assessments for this course include:
Suggested but not limited to:

- Pre-assessments of prior knowledge (e.g., Entrance cards or KWL chart)
- Bellringers/Problems of the Day (PODs)
- Discussions
- Exit ticket
- Teacher observations/Questioning
- Graphic organizers (e.g., Venn Diagrams, word mapping, webbing, KWL chart, etc.)
- Outlining
- Cooperative learning
- Written work
- Quizzes
- Oral response
- Self-evaluation
- Homework
- Summarizing
- Note-taking

Summative Assessments: The teacher will utilize a variety of assessment methods to evaluate student learning at the end of an instructional task, lesson, and/or unit.

Effective summative assessments for this course include:
Suggested but not limited to:

- Performance assessment
- Chapter/unit tests
- Quizzes
- Marking period assessments
- Projects
- Student presentations