WARREN COUNTY SCHOOL DISTRICT

PLANNED INSTRUCTION

COURSE DESCRIPTION

Course Title: Algebra IB
Course Number: 00226
Course Prerequisites: Successful completion of Algebra IA

Course Description: Algebra IB is the second of the two-year Algebra course sequence. Algebra IB continues using practical problems to apply theory and connect algebra to the real world. This course includes the study of numbers and operations, polynomials, quadratics, statistics, linear equations, and systems of linear equations and inequalities. The recommended high school math sequence to graduate would be successful competition of Algebra IA, Algebra IB, and Geometry. Earning Proficient or Advanced on the Algebra Keystone Exams at the conclusion of Algebra IB is a possible pathway element for students to meet graduation requirements. If this state mandated test is not passed students will retake the exam. District marking period assessments and final exam are required.

Suggested Grade Level: Grades 10-12
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: 02054
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:	*enVision Algebra 1*
Publisher:	SAVVAS Learning Company LLC.
ISBN #:	978-0-328-93154-5
Copyright Date:	2018
WCSD Board Approval Date:	6/29/2020

Supplemental Materials: Kuta Software, Get More Math, pdesas.org

Curriculum Document

WCSD Board Approval:

Date Finalized:	5/23/2022
Date Approved:	6/13/2022
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: Radicals: Expressions and Equations, Exponents and Exponential Functions

- Order of Operations with Real Numbers
- Review: Simplification of Radicals
- Operations with Radical Expressions
- Review: Basic Square Root and Cube Root Equations
- Quadratic Equations: Square Root Property
- Rules of Exponents – Monomials
- Marking Period 1 Review and Assessment

Marking Period 2: Polynomials and Factoring, and Solving Quadratic Equations

- Polynomials: Classification, Standard Form (Review)
- Polynomials: Addition, Subtraction, Multiplication (Review)
- Polynomial Factoring:
    - Greatest Common Factor (GCF)
    - $ax^2 + bx + c$, where $a = 1$
    - $ax^2 + bx + c$, leading coefficient always GCF
    - $ax^2 + bx + c$, where $a \neq 0$ (introduced, not mastered)
    - Grouping
    - Special Cases: Difference of Squares, Perfect Square Trinomials
- Simplification of Rational Expressions
- Polynomial Problem Solving
- Quadratic Equations: Solve by Using Graphs and Tables
- Quadratic Equations: Solve by Factoring
- Mid-Term Review and Assessment

Marking Period 3: Data Analysis/Statistics, Linear Equations and Graphs, and Systems of Linear Equations: Graphing

- Data Displays: Presentations, Analysis, Comparison
- Interpretation of Shapes of Data Displays
- Standard Deviation
- Two-Way Frequency Tables
- Review - Linear Equations and Graphs:
    - Slope-Intercept Form
    - Point-Slope Form
    - Standard Form
- Systems of Linear Equations: Graphs
- Marking Period 3 Review and Assessment

Marking Period 4: Systems of Linear Equations and Linear Inequalities, and Algebra Keystones

- Systems of Linear Equations: Substitution, Elimination
- Systems of Linear Equations: Problem Solving
- Linear Inequalities in Two Variables
- Systems of Linear Inequalities
- Algebra Keystone Prep and Exam
- Final Exam Review and Assessment

Standards/Eligible Content and Skills

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
Review: Simplify expressions by using the order of operations	M07.B-E.1.1.1	MP1
Review: Evaluate square roots of perfect squares and cube roots of perfect cubes without a calculator.	M08.B-E.1.1.2	MP1
Use the Product Property of Square Roots to simplify radical expressions (Numbers only, no variable expressions)	A1.1.1.3.1	MP1
Simplify products and quotients of radical expressions (No rationalizing necessary)	A1.1.1.3.1	MP1
Review: Solving multi-step equations	A1.1.2.1.1	MP1
Review: Write multi-step equations to model and solve real-world and mathematical problems	A1.1.2.1.1	MP1
Review: Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number.	M08.B-E.1.1.2	MP1
Solve quadratic equations using the Square Root Property ($ax^2 + b = c$)	A1.1.1.3.1	MP1
Write square and cube equations to model and solve real-world and mathematical problems	A1.1.1.3.1 CC.2.1.HS.F.1 CC.2.1.HS.F.2	MP1
Simplify monomials expressions: Zero and negative exponents	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Simplify monomial expressions: Multiply powers with the same base	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Simplify monomial expressions: Raise a product to a power	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Simplify monomial expressions: Raise a power to a power	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Simplify monomial expressions: Divide powers with the same base	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Simplify monomial expressions: Raise a quotient to a power	A1.1.1.1 A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Use exponents to solve real-world and mathematical problems (Exponents should be integers from -10 to 10)	A1.1.1.3.1 CC.2.1.HS.F.1	MP1
Marking Period 1 Review and Assessment		MP1
• Review and extend knowledge of Radicals: Expressions and Equations		MP1

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
• Review and extend knowledge of Exponents and Exponential Functions		MP1
Review: Classify polynomials by their degree and number of terms	CC.2.2.HS.D.1	MP2
Review: Write polynomials in standard form	CC.2.2.HS.D.1	MP2
Review: Add and subtract polynomials	A1.1.1.5.1 CC.2.2.HS.D.3	MP2
Review: Multiply polynomials (No larger than first degree FOIL of binomials)	A1.1.1.5.1 CC.2.2.HS.D.3	MP2
Multiply polynomials (No larger than the product of a binomial and trinomial)	A1.1.1.5.1 CC.2.2.HS.D.3	MP2
Determine the square of a binomial	A1.1.1.5.1 CC.2.2.HS.D.3	MP2
Find the product of a sum and difference	A1.1.1.5.1 CC.2.2.HS.D.3	MP2
Factor polynomials using the Greatest Common Factor (GCF)	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor trinomials in the form: $ax^2 + bx + c$, where $a = 1$	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor trinomials in the form: $ax^2 + bx + c$, leading coefficient is always the GCF	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor trinomials in the form: $ax^2 + bx + c$, where $a \neq 0$ (Introduced, not mastered)	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor polynomials by grouping	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor special-case polynomials: Difference of Squares, Perfect Square Trinomials	A1.1.1.2.1 A1.1.1.5.2	MP2
Factor polynomials completely	A1.1.1.2.1 A1.1.1.5.2	MP2
Simplify rational expressions (Factorable polynomial divided by a factorable polynomial)	A1.1.1.5.3 CC.2.2.HS.D.6	MP2
Use polynomials and their operations to model and solve real-world and mathematical problems	A1.1.1.4.1 A1.1.1.2.1 A1.1.1.5.1 A1.1.1.5.2	MP2
Identify solutions of quadratic equations when provided a graph	CC.2.2.HS.D.9 CC.2.2.HS.D.10	MP2
Identify solutions of quadratic equations when provided a table	CC.2.2.HS.D.9 CC.2.2.HS.D.10	MP2
Solve quadratic equations by factoring using the Zero-Product Property (Introduced, not mastered)	A1.1.1.5.2 A2.1.3.1.1	MP2
Mid-Term Review and Assessment		MP2

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
• Review and extend knowledge of Radicals: Expressions and Equations		MP2
• Review and extend knowledge of Exponents and Exponential Functions		MP2
• Review and extend knowledge of Polynomials and Factoring		MP2
• Review and extend knowledge of Solving Quadratic Equations		MP2
Find and make conclusions about the measures of central tendency	A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.1	MP3
Represent and interpret data using various representations: Dot Plot, Histogram, Box-and-Whisker Plot	A1.2.3.1.1 A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.1	MP3
Compare data sets that are displayed with the same representation: Dot plot, Histogram, Box-and-Whisker Plot	A1.2.3.1.1 A1.2.3.2.2 CC.2.4.HS.B.1 CC.2.4.HS.B.3	MP3
Interpret and compare shapes of distributions	A1.2.3.1.1 A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.1 CC.2.4.HS.B.3	MP3
Compute and interpret the standard deviation of a data set	A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.1	MP3
Compare data sets using the standard deviation	A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.1	MP3
Create and interpret data using a two-way frequency table	A1.2.3.2.1 A1.2.3.2.2 CC.2.4.HS.B.2	MP3
Write equations: Slope-Intercept Form, Point-Slope Form, Standard form	A1.1.2.1.1 A1.2.1.2.1 A1.2.1.2.2 A1.2.2.1.3	MP3
Transform equations from one indicated form into another: Slope-Intercept Form, Point-Slope Form, Standard Form	A1.2.1.2.2 CC.2.2.HS.D.2 CC.2.2.HS.C.2	MP3
Graph linear equations: Slope-Intercept Form, Point-Slope Form, Standard Form	A1.1.2.1 A1.2.1.1 A1.2.1.2.1 CC.2.2.HS.D.8 CC.2.2.HS.D.10	MP3
Verify solutions to systems of linear equations	A1.1.2.2.2	MP3

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
	CC.2.2.HS.D.10	
Solve systems of linear equations by graphing	A1.1.2.2.1 A1.1.2.2.2	MP3
Marking Period 3 Review and Assessment		MP3
• Review and extend knowledge of Data Analysis/Statistics		MP3
• Review and extend knowledge of Linear Equations and Graphs		MP3
• Review and extend knowledge of Systems of Linear Equations: Graphs		MP3
Solve systems of linear equations by substitution	A1.1.2.2.1 A1.1.2.2.2 CC.2.2.HS.D.10	MP4
Solve systems of linear equations by elimination	A1.1.2.2.1 A1.1.2.2.2 CC.2.2.HS.D.10	MP4
Identify linear systems with infinitely more or no solutions using any method: Graphing, Substitution, Elimination	A1.1.2.2.1 A1.1.2.2.2 CC.2.2.HS.D.10	MP4
Write systems of linear equations to model and solve real-world and mathematical problems	A1.1.2.2.1 A1.1.2.2.2 CC.2.2.HS.D.10	MP4
Graph a linear inequality in two variables	A1.1.3.2.1 A1.2.2.1.1 CC.2.2.HS.D.10	MP4
Write a two-variable inequality to model a graph	A1.1.3.2.1 A1.2.2.1.1 CC.2.2.HS.D.10	MP4
Graph a system of linear inequalities in two variables	A1.1.3.2.1 A1.2.2.1.1 CC.2.2.HS.D.7 CC.2.2.HS.D.10	MP4
Write a system of linear inequalities in two variables to model a graph	A1.1.3.2.1 A1.2.2.1.1 CC.2.2.HS.D.7 CC.2.2.HS.D.10	MP4
Algebra Keystone Prep and Exam		MP4
• Review and extend knowledge of Operations with Real Numbers and Expressions		MP4
• Review and extend knowledge of Linear Equations		MP4
• Review and extend knowledge of Linear Inequalities		MP4
• Review and extend knowledge of Functions		MP4
• Review and extend knowledge of Coordinate Geometry		MP4
• Review and extend knowledge of Data Analysis		MP4

Performance Indicator	**PA Core Standard and/or Eligible Content**	**Marking Period Taught**
• Review and extend knowledge of Probability		MP4
Final Exam Review and Assessment		MP4
• Review and extend knowledge of Data Analysis/Statistics		MP4
• Review and extend knowledge of Linear Equations and Graphs		MP4
• Review and extend knowledge of Systems of Linear Equations		MP4
• Review and extend knowledge of Systems of Linear Inequalities		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
- Mid-term exam
- Final exam
- Projects
- Student presentations