

MORENO VALLEY HIGH SCHOOL PRE-ALGEBRA CURRICULUM

Course Title: PreAlgebra Course Number: _____

Department: Mathematics ADS Number: _____

Prerequisites: None

Length of Course: Year long Credit/PRI Area: .5 per semester Grade Level(s): -10

COURSE DESCRIPTION

This class is designed to prepare students for Algebra I. Topics to be covered include but are not limited to real numbers and sets of numbers (addition, subtraction, multiplication, and division of), equality and inequality symbols, and variables, the number line, graphing subsets of real numbers, absolute value, fractions: addition, subtraction, multiplication and division of, simplification of, mixed numbers, relationship to percentages and decimals; rounding whole numbers and decimals, exponents, order of operations, geometry: perimeter, area, and volume of common shapes (i.e.-square, rectangle, triangle, circle, cube, cylinder, cone), and introduction to basic algebraic expressions.

SYLLABUS

Topics studied:

1. Real numbers and sets of numbers (addition, subtraction, multiplication, and division of)
2. Equality and inequality symbols, and variables
3. Number line
4. Graphing subsets of real numbers
5. Absolute value
6. Fractions:
 - Addition, subtraction, multiplication and division of
 - Simplification of
 - Mixed numbers
 - Relationship to percentages and decimals
7. Percentages (conversion to decimals and fractions)
8. Decimals (conversion to percentages and fractions)
9. Rounding whole numbers and decimals
10. Exponents
11. Order of operations
12. Geometry
 - Perimeter and area of common shapes (i.e.-square, rectangle, triangle, circle) Volume of cube, prism, cylinder, cone
13. Introduction to basic algebraic expressions.

Skills Emphasized:

1. Problem Solving
2. Critical Thinking
3. Manipulation of Fractions
4. Order of Operations
5. Understanding Logical Process
6. Group Work

STRATEGIES

Begin a new lesson with a question and answer session regarding the new topic to access prior knowledge.

Read through the text that applies to the new lesson and work sample problems posing questions to seek support from students.

Address student questions throughout the demonstration process.

Assign problems for students to practice new concepts individually or in groups.

Continue demonstrating new concepts by working more challenging problems form assignment asking questions to seek student support and involvement.

Move throughout classroom monitoring progress of students' work and answering specific questions.

At the start of next class offer to support students at the white board working most challenging problems from previous days assignment.

ASSESSMENTS

Daily homework assignments

Weekly or biweekly quizzes consisting of 5-10 questions addressing the past homework assignments

Unit tests given every 4-6 weeks

Class participation

Quarterly seminars to address more complicated real world applications

SUGGESTED TEXTBOOKS AND INSTRUCTIONAL MATERIALS

Algebra ½ An Incremental Development 3rd Edition John H. Saxon, Jr.

The Man Who Counted: A Collection of Mathematical by Malba Tahan

SUGGESTED TITLES/AUTHORS WEB SITES

None

SEMINAR PIECES OR USE

Complex word problems chosen from text

The Man Who Counted: A Collection of Mathematical Adventures by Malba Tahan

STRAND I: NUMBERS AND OPERATIONS
CONTENT STANDARD 1: STUDENTS WILL UNDERSTAND NUMERICAL CONCEPTS AND MATHEMATICAL OPERATIONS.

A. BENCHMARK: *Understand numbers, ways of representing numbers, relationships among numbers, and number systems.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	1. Sort numbers by their properties (e.g., prime, composite, square, square root). 2. Demonstrate the magnitude of rational numbers (e.g., trillions to millions).	Sample hands-on activity: Sort a bag of skittles by properties such as colors. Lesson 12 Lesson 87 Lesson 123

STRAND I: NUMBERS AND OPERATIONS
CONTENT STANDARD 1: STUDENTS WILL UNDERSTAND NUMERICAL CONCEPTS AND MATHEMATICAL OPERATIONS.

B. BENCHMARK: *Understand the meaning of operations and how they relate to one another.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	1. Use real number properties (e.g., commutative, associative, distributive) to perform various computational procedures. 2. Perform arithmetic operations and their inverses (e.g., addition/subtraction, multiplication/division, square roots of perfect squares, cube roots of perfect cubes) on real numbers. 3. Find roots of real numbers using calculators.	Seminar and solve problems from <i>The Man Who Counted</i> , chapters 3-34. Lesson 87 Lesson 103 Lesson s 14-30, 40, 92 Lesson 106 Lesson 92 Lesson 44

STRAND I: NUMBERS AND OPERATIONS
CONTENT STANDARD: STUDENTS WILL UNDERSTAND NUMERICAL CONCEPTS AND MATHEMATICAL OPERATIONS.

C. BENCHMARK: *Compute fluently and make reasonable estimates.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
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GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	<ol style="list-style-type: none"> 1. Formulate algebraic expressions that include real numbers to describe and solve real-world problems. 2. Use a variety of computational methods to estimate quantities involving real numbers. 3. Differentiate between rational and irrational numbers. 4. Use real number properties to perform various computational procedures and explain how they were used. 5. Perform and explain computations with rational numbers, pi, and first-degree algebraic expressions in one variable in a variety of situations. 6. Select and use appropriate forms of rational numbers to solve real-world problems including those involving proportional relationships. 7. Approximate, mentally and with calculators, the value of irrational numbers as they arise from problem situations. 8. Express numbers in scientific notation (including negative exponents) in appropriate problem situations using a calculator. 9. Estimate answers and use formulas to solve application problems involving surface area and volume. 	<p>Students create a business to model real world problems such as design an acequia system: estimate flow, volume, cost etc. Have students provide a more realistic model. Seminar on the benefits and short comings of models.</p> <p>Lesson 90</p> <p>Lessons 7-35</p> <p>Lesson 123</p> <p>Lesson 87</p> <p>Lesson 103</p> <p>Lessons 35-60</p> <p>Lesson 123</p> <p>Lesson 110</p> <p>Lesson 123</p> <p>Lesson 50</p> <p>Lessons 45, 73, 88, 120</p>

STRAND II: ALGEBRA
CONTENT STANDARD 2: STUDENTS WILL UNDERSTAND ALGEBRAIC CONCEPTS AND APPLICATIONS.

A. BENCHMARK: *Understand patterns, relations, and functions.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	<ol style="list-style-type: none"> 1. Move between numerical, tabular, and graphical representations of linear relationships. 2. Use variables to generalize patterns and information presented in tables, charts, and graphs: <ul style="list-style-type: none"> • graph linear functions noting that the vertical change per unit of horizontal change (the slope of the graph) is always the same • plot the values of quantities whose ratios are always the same, fit a line to the plot, and understand that the slope of the line equals the quantities 	<p>See acequia project above.</p> <p>Lessons 29, 38, 85</p> <p>Lesson 85</p> <p>Lessons 55-66</p>

STRAND II: ALGEBRA**CONTENT STANDARD 2: STUDENTS WILL UNDERSTAND ALGEBRAIC CONCEPTS AND APPLICATIONS.**

B. BENCHMARK: *Represent and analyze mathematical situations and structures using algebraic symbols.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	1. Demonstrate the difference between an equation and an expression. 2. Solve two-step linear equations and inequalities in one variable with rational solutions. 3. Evaluate formulas using substitution. 4. Demonstrate understanding of the relationships between ratios, proportions, and percents and solve for a missing term in a proportion. 5. Graph solution sets of linear equations in two variables on the coordinate plane. 6. Formulate and solve problems involving simple linear relationships, find percents of a given number, variable situations, and unknown quantities. 7. Use symbols, variables, expressions, inequalities, equations, and simple systems of equations to represent problem situations that involve variables or unknown quantities.	Seminar and solve problems from <i>The Man Who Counted</i> , chapters 3-34. Lesson 47 Lesson 97 Lesson 54 Lesson 54, 108 Lesson 75 Lesson 85 Lesson 68 Lesson 90

STRAND II: ALGEBRA**CONTENT STANDARD 2: STUDENTS WILL UNDERSTAND ALGEBRAIC CONCEPTS AND APPLICATIONS.**

C. BENCHMARK: *Use mathematical models to represent and understand quantitative relationships.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	1. Generate different representations to model a specific numerical relationship given one representation of data (e.g., a table, a graph, an equation, a verbal description).	Lesson 87 Student create graphs of Moreno Valley demographics and compare it to Taos.

STRAND II: ALGEBRA**CONTENT STANDARD 2: STUDENTS WILL UNDERSTAND ALGEBRAIC CONCEPTS AND APPLICATIONS.**

D. BENCHMARK: *Analyze changes in various contexts.*

GRADE	PERFORMANCE STANDARDS (Grade 8)	ILLUSTRATIONS
9-10	<ol style="list-style-type: none"> 1. Use graphs, tables, and algebraic representations to make predictions and solve problems that involve change. 2. Estimate, find, and justify solutions to problems that involve change using tables, graphs, and algebraic expressions. 3. Use appropriate problem-solving strategies (e.g., drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table or graph, working a simpler problem, writing an algebraic expression or working backward) to solve problems that involve change. 4. Solve multi-step problems that involve changes in rate, average speed, distance, and time. 5. Analyze problems that involve change by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing, and observing patterns. 6. Generalize a pattern of change using algebra and show the relationship among the equation, graph, and table of values. 7. Recognize the same general pattern of change presented in different representations. 	<p>Lessons 112, 114, 122</p> <p>Lessons 112, 114, 122</p> <p>Lesson 77-84</p> <p>Lesson 58</p> <p>Lessons 36, 63</p> <p>Lessons 36, 63</p>