

**CANON CITY HIGH SCHOOL
COURSE GUIDE**

Department: Math

Course Title: Introduction to Algebra

Date: Fall 2003

Grade Level: 9-12

Prerequisite/Requirements:

Orleans-Hanna score between 40 and 70

Costs to Students: 3 ring binder, paper, and pencils

Course Description:

This course is designed for students who need more background before entering Algebra. Students will work with the set of rational numbers, linear equations and inequalities, formulas, geometric shapes, setting up and solving equations from word problems, data analysis, and concepts of probability.

General Course Outcomes:

Upon completion of this course the proficient student will know and be able to: (core concepts/essential skills).

- 1: Students will have an understanding of variable expressions, properties of real numbers, and solving exponential equations involving the order of operations.
- 2: Students will know how to simplify expressions and identify patterns that link with functions.
- 3: Students will be able to graph functions on a coordinate plane using their knowledge of positive numbers, negative numbers, zero, opposites, and absolute values.
- 4: Students will be able to solve one- and two- step equations using integers, the distributive property, and the simplification of expressions.

5: Students will have an understanding of pictographs, single and double bar graphs, and line graphs. Using the information given to them they will be able to find the mean, median, mode, and range of a set of data.

6: Students will have a basic knowledge of geometry as they identify shapes, angles, and lines.

7: Students will learn some elementary topics from number theory as well as fraction concepts that are essential for success in algebra.

8: Students are introduced to operations with rational numbers that are extended to include algebraic fractions.

9: Students are introduced to the concepts of ratio, proportion, and percent.

10: Students will learn the concepts of probability

Standards:

List State Standards addressed in this course. (Identify the course outcomes that support those standards.)

1.1 Demonstrate meanings for real numbers, absolute value, and scientific notation using physical materials and technology in problem-solving situations.

1.2 Develop, test and explain conjectures about properties of number systems and sets of numbers.

1.3 Use number sense to estimate and justify the reasonableness of solutions to problems involving real numbers.

2.1 Model real-world phenomena (for example, distance-versus-time relationships, compound interest, amortization tables, mortality rates) using functions, equations, inequalities, and matrices.

2.2 Represent functional relationships using written explanations, tables, equations, and graphs, and describe the connections among these representations.

2.5 Interpret algebraic equations and inequalities geometrically and describe geometric relationships algebraically.

3.1 Design and conduct a statistical experiment to study a problem, and interpret and communicate the results using the appropriate technology (for example, graphing calculators, computer software)

3.2 Analyze statistical claims for erroneous conclusions or distortions.

3.3 Fit curves to scatter plots using informal methods or appropriate technology to determine the strength of the relationship between two data sets and to make predictions.

3.4 Draw conclusions about distributions of data based on analysis of statistical summaries (for example, the combination of mean and standard deviation, and differences between the mean and median).

3.5 Use experimental and theoretical probability to represent and solve problems involving uncertainty (for example, the chance of playing professional sports if a student is a successful high school athlete).

3.6 Solve real-world problems with informal use of combinations and permutations (for example, determining the number of possibilities at a restaurant featuring a given number of side dishes).

4.1 Find and analyze relationships among geometric figures using transformations (for example, reflections, translations, rotations, dilations) in coordinate systems.

4.2 Derive and use methods to measure perimeter, area, and volume of regular and irregular geometric figures.

4.3 Make and test conjectures about geometric shapes and their properties, incorporating technology where appropriate.

5.1 Measure quantities indirectly using techniques of algebra, geometry, or trigonometry.

5.2 Select and use appropriate techniques and tools to measure quantities in order to achieve specified degrees of precision, accuracy, and error (or tolerance) of measurements.

5.3 Determine the degree of accuracy of a measurement.

6.1 Use ratios, proportions, and percents in problem-solving situations.

6.2 Select and use appropriate methods for computing with real numbers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determine whether the results are reasonable.

6.3 Describe the limitations of estimation and assess the amount of error resulting from estimation within acceptable tolerance limits.

Required Unit of Study:

Themes within the course/Specific concepts being targeted

- Variables and Variable Expressions involving addition, subtraction, multiplication, and division.
- Integers.
- Basic equations.
- Graphs and data analysis.
- Basic Geometry concepts.
- Number theory and fraction concepts.
- Rational Numbers.
- Statistics and circle graphs.
- Probability.

Unit Modifications/Enrichments:

Assistance to students having difficulty and/or special needs

- Provide extra time for assignments/test, as needed
- Assistance with reading comprehension
- Preferential seating
- Teacher – assisted tutoring, before/after school, as requested
- Pass/fail grading

Additional experiences for students capable of advanced work (cooperative learning, adaptive materials, re-teaching, second chance, etc:

- Cooperative/small group learning
- Teacher/student designed, text-based, self-pacing program

- Advanced problems and/or additional assignments

Materials/Resources:

Textbook (CORE and Supplemental) (Publisher, Edition, Year Adopted)

Mathematical Connections: A Bridge to Algebra and Geometry, Houghton Mifflin Company, 1999

Media materials Used: None

Technology needs: None

Other resources: None

Assessment Program

- Tests and Quizzes, Homework
 - daily homework assignments are given: 30-60 minutes in length
 - in class quizzes prepared by instructor
- **Notebooks**
 - students are required to keep an organized notebook with daily notes, assignments, and any assigned projects.
- **Authentic production**
- **Proficiency Test Requirement**

Instructional Time:

- Variables and Variable Expressions involving addition, subtraction, multiplication, and division.
- Integers.
- Basic equations.
- Graphs and data analysis.
- Basic Geometry concepts.
- Number theory and fraction concepts.
- Rational Numbers.
- Statistics and circle graphs.
- Probability.

Approximately 1-3 weeks for each unit