

**CANON CITY HIGH SCHOOL
COURSE GUIDE**

Department: Mathematics

Course Title: General Math

Date: August 27, 2003

Grade Level: 9-12

Prerequisite/Requirements: Less than 40% on Orleans-Hanna test

Costs to Students: 3 ring binder, compass, protractor, paper, and pencils.

Course Description: This course focuses on the basic computational skills students need for everyday life, and is designed to allow students to prepare for successful transition to the Introduction to Algebra course. While General Math does not count as a math credit, it may be used as an elective credit toward graduation; three math courses **beyond** General Math are required to graduate. Activities for the course include practice with whole numbers, fractions, decimals, percent, proportion, and ratio. There are also informal studies of probability, statistics, algebra, geometry, as well as practical applications in consumer math designed to emphasize math usage in the workday world.

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

- a) Students will be able to add, subtract, multiply, and divide whole numbers, and apply those skills to practical, relevant problems.
- b) Students will be able to add, subtract, multiply, and divide fractions and mixed numbers, and apply those skills to practical, relevant problems.
- c) Students will be able to add, subtract, multiply, divide, round, and compare decimal numbers, and apply those skills to practical problems involving money and percents.
- d) Students will recognize percentage and its relationship to decimal numbers, be able to find relative percentages, relate percentage in a practical way to problems involving money (sales tax, discounts), and be able to convert fractions and decimal numbers into percentage equivalents.
- e) Students will understand the concept and application of ratios and proportions.
- f) Students will understand the basic English and metric systems of measurement.
- g) Students will be able to write and evaluate simple linear equations and inequalities.

- h) Students will be able to recognize and identify geometric shapes and angles, compute: 1) the area and perimeter of polygons, 2) the area and circumference of circles, 3) the volume of rectangular prisms, and 4) the length of a triangle's leg using the Pythagorean Theorem.
- i) Students will be able to calculate simple statistics, probabilities, and understand the concept of central tendency.
- j) Students will be able to plot points on a two-dimensional graph, and interpret bar, line, and circular graphs.

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

Standard 1: Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.

Supporting course outcomes: a, b, c, d, e, g

Standard 2: Students use algebraic methods to explore, model and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.

Supporting course outcomes: g

Standard 3: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning and processes used in solving these problems.

Supporting course outcomes: e, i, j

Standard 4: Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.

Supporting course outcomes: h

Standard 5: Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning and results in solving these problems.

Supporting course outcomes: f

Standard 6: Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil,

calculators and computers, in problem-solving situations and communicate the reasoning used in solving these problems.

Supporting course outcomes: a, b, i, j

Required Unit of Study: Themes within the course/Specific concepts being targeted

Unit 1: Understanding Whole Numbers

- Place and number value
- Rounding whole numbers
- Adding, subtracting, multiplying and dividing whole numbers
- Prime and composite numbers
- Prime factorization
- Greatest common factors

Unit 2: Understanding Fractions

- Identify types of fractions (proper, improper, reduced, equivalent)
- Reducing and raising fractions to alternate forms
- Changing mixed numbers \leftrightarrow improper fractions
- Adding/subtracting fractions
- Adding/subtracting mixed numbers
- Identifying LCM and LCD
- Comparing fractions
- Multiplying/dividing fractions
- Multiplying/dividing mixed numbers
- Reciprocals

Unit 3: Understanding Decimals

- Read and identify decimals
- Relate money to decimals
- Rounding decimals
- Compare/order decimals
- Changing fractions \leftrightarrow decimals
- Add/subtract mixed decimals/money
- Multiply/divide decimals
- Solve multi-step word problems involving decimals

Unit 4: Understanding Percents

- Changing percents \leftrightarrow decimals
- Computing sales tax, discounts, & commissions
- Decimal/fraction equivalents

- Calculating what percent one number is of another

Unit 5: Understanding Ratio and Proportion

- Understanding and applying ratios
- Understanding and manipulating proportions

Unit 6: Understanding Measurement

- Understanding standard English units of measure (volume, weight, area, length)
- Understanding metric units of measurement (volume, mass, area, length)
- Measuring time
- Measuring temperature

Unit 7: Understanding Algebra

- Writing algebraic expressions
- Understanding exponents
- Evaluating algebraic expressions
- Using grouping symbols (parentheses)
- Understanding equations
- Understanding integers
- Understanding inequalities

Unit 8: Understanding Geometry

- Recognizing geometric shapes
- Identifying/measuring angles
- Identifying triangles
- Finding the area/perimeter of a polygon
- Finding the volume of a rectangular prism
- Understanding circumference/area of circles
- Understanding square roots
- Pythagorean Theorem

Unit 9: Understanding Statistics and Probability

- Statistics
- Frequency tables
- Measures of central tendency
- Probability

Unit 10: Understanding Graphs

- Graphing pairs of numbers
- Analyzing and interpreting information on a graph

Unit Modifications/Enrichments:

Assistance to students having difficulty and/or special needs:

- Provide extra time for assignments/tests, 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)

Mathematics Connections, 1st Edition, Glencoe/McGraw-Hill - adopted 2003

SUPPLEMENTAL: Competency Mathematics, 1st Edition, by Dr. Larry Parsky - adopted 2003

- Media materials used:
- Technology needs: Computer lab (drill/practice math programs), overhead projector
- Other resources:

Assessment Program

• Tests and Quizzes, Homework

Tests: Publisher and /or Teacher Developed Tests/Quizzes are used as assessments.

Homework: Both in-class (guided practice) and take-home homework is assigned.

- **Type: Essay, constructed response, criterion referred, oral presentation**

- **Notebook**

-students are required to keep an organized notebook with daily notes, assignments, and any assigned projects.

- **Authentic production**

- **Proficiency Test Requirement**

-Must pass Orleans-Hanna proficiency exam with $\geq 40\%$.

Instructional time:

Whole Numbers 1-3 weeks

Fractions 2-4 weeks

Decimals 2-4 weeks

Percents 1-3 weeks

Ratio and Proportion 1-3 weeks

Measurement 1-3 weeks

Algebra 2-4 weeks

Geometry 2-4 weeks

Statistics and Probability 1-3 weeks

Graphs 1-3 weeks