

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT

**Course Outline
CAHSEE Mathematics and Skill Building**

Date: May 2006

Subject Area: Mathematics

Grade Level: 11-12

Course Length: One Semester

Grading: A-F

Number of credits: 5

Prerequisites: Score <350 Mathematics portion of CAHSEE

COURSE DESCRIPTION:

The CAHSEE Mathematics and Skill Building course is designed to provide remedial instruction to students who have failed the California High School Exit Exam in mathematics. It will provide students instruction designed specifically for success on the CAHSEE, test-taking strategies, and review of Algebra standards in a structured, focused environment. Because state funds provide for students who have not passed the exam, the class will run at a ratio of approximately 24 to 1.

GENERAL GOALS/PURPOSES:

The goal of this course is to give students every opportunity to pass the mathematics portion of CAHSEE. Students will receive intensive instruction in Number Sense; Algebra and functions, measurements, Geometry, statistics, data analysis and probability, Algebra I, and test-taking strategies.

STUDENT READING COMPONENT:

Students will receive instruction on the effective use of their CAHSEE Prep resources. This course will also include applications for effective reading and analysis of the test questions as they would appear on CAHSEE.

STUDENT WRITING COMPONENT:

Students will have opportunities to express their understanding of concepts in writing to the class.

STUDENT ORAL COMPONENT:

Students will have opportunities to present work orally to the class.

DETAILED UNITS OF INSTRUCTION:

First Quarter (Third Quarter):

1) Number Sense

- a) Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.
- b) Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.
- c) Convert fractions to decimals and percents, and use these representations in estimations, computations, and applications.
- d) Differentiate between rational and irrational numbers.
- e) Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.
- f) Calculate the percentage of increases and decreases of a quantity.
- g) Solve problems that involve discounts, markups, commissions and profit, and compute simple and compound interest.
- h) Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.
- i) Add and subtract fractions by using factoring to find common denominators.
- j) Multiply, divide, and simplify rational numbers by using exponent rules.
- k) Square roots
- l) Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers.

2) Algebra and Functions

- a) Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A).
- b) Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$.
- c) Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.
- d) Students interpret and evaluate expressions involving integer powers and simple roots:

- e) Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents.
- f) Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.
- g) Identify quadratic and cubic graphs.
- h) Graph linear functions, noting that the vertical change (change in y - value) per unit of horizontal change (change in x - value) is always the same and know that the ratio ("rise over run") is called the slope of a graph.
- i) Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot.
- j) Solve two-step linear equations and inequalities.
- k) Solve multi-step problems involving rate, average speed, distance, and time or a direct variation.

Second Quarter (Fourth Quarter):

3) Measurement and Geometry

- a) Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters).
- b) Construct and read drawings and models made to scale.
- c) Use measures expressed as rates (e.g., speed, density) and measures expressed as products to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer.
- d) Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures.
- e) Estimate and compute the area of more complex or irregular two-and three-dimensional figures by breaking the figures down into more basic geometric objects.
- f) Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids.
- g) Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.
- h) Know and understand the Pythagorean Theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments.
- i) Demonstrate an understanding of conditions that indicate two geometrical figures are congruent.

4) Statistics, Data Analysis, and Probability

- a) Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data.
- b) Represent two numerical variables on a scatter plot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between times spent on homework and grade level).
- c) Understand the meaning of, and be able to compute, the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set.
- d) Identify claims based on statistical data and in simple cases, evaluate the validity of the claims.
- e) Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.
- f) Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, $1 - P$ is the probability of an event not occurring.
- g) Understand the difference between independent and dependent events.

5) Algebra I

- a) Students understand and use such operations as taking the opposite, finding the reciprocal, and taking a root. They understand and use the rules of exponents.
- b) Students solve equations and inequalities involving absolute values.
- c) Students simplify expressions before solving linear equations and inequalities in one variable
- d) Students solve multi-step problems including word problems, involving linear equations and linear inequalities in one variable, and provide justification for each step.
- e) Students graph a linear equation and compute the x - and y - intercepts.
- f) Students verify that a point lies on a line, given an equation of the line.
- g) Students understand the concepts of parallel lines and how those slopes are related.
- h) Students solve a system of two linear equations in two variables algebraically, and are able to interpret the answer graphically.
- i) Students add, subtract, multiply, and divide monomials and polynomials. Students solve multi-step problems, including word problems by using these techniques.
- j) Students apply algebraic techniques to solve rate, work, and percent mixture problems.

THIS COURSE WILL PREPARE STUDENTS FOR THE CAHSEE AND / OR THE FCUSD EXIT EXAMS:

In Mathematics

LAB FEE:

None

SUBJECT AREA STANDARDS TO BE ADDRESSED:

California High School Exit Exam Standards for Mathematics

DISTRICT ESLRs TO BE ADDRESSED:

Students will be:

- **Self-directed Learners:** who will be able to use notes and a textbook to assist them in continuing their learning outside of the classroom.
- **Efficient Communicators:** who can explain mathematical concepts to others and use mathematics to organize and explain data.
- **Quality Producers:** who understand the importance of neat, organized work that demonstrates their thinking and understanding of the solution they've formed to solve a problem.
- **Constructive Thinkers:** who are able to attack problems with organization, logic, and mathematical skills they've developed in a systematic fashion.
- **Collaborative Workers:** who can work in a variety of settings in culturally diverse groups. They will be able to form and use study groups to strengthen their own understanding in addition to providing the same service for classmates.
- **Responsible Citizens:** who accept the consequences of their actions and demonstrate understanding of their role in the learning process.