



**Manhattan Beach
Unified School District**

CONTENT STANDARDS

GRADE SIX

ENGLISH-LANGUAGE ARTS

MATHEMATICS

SCIENCE

HISTORY-SOCIAL SCIENCE

ENGLISH-LANGUAGE ARTS CONTENT STANDARDS

GRADE SIX

READING

1.0 Word Analysis, Fluency, and Systematic Vocabulary Development

Word Recognition

1.1 Read aloud narrative and expository text fluently and accurately and with appropriate pacing, intonation, and expression.

Vocabulary and Concept Development

1.2 Identify and interpret figurative language and words with multiple meanings. **(CAHSEE)**

1.3 Recognize the origins and meanings of frequently used foreign words in English and use these words accurately in speaking and writing.

1.4 Monitor expository text for unknown words or words with novel meanings by using word, sentence, and paragraph clues to determine meaning. **(CAHSEE)**

1.5 Understand and explain “shades of meaning” in related words (e.g., *softly and quietly*). **(CAHSEE)**

2.0 Reading Comprehension (Focus on Informational Materials)

Structural Features of Informational Materials

2.1 Identify the structural features of popular media (e.g., newspapers, magazines, online information) and use the features to obtain information.

2.2 Analyze text that uses the compare-and-contrast organizational pattern.

Comprehension and Analysis of Grade-Level-Appropriate Text

2.3 Connect and clarify main ideas by identifying their relationships to other sources and related topics. **(CAHSEE)**

2.4 Clarify an understanding of texts by creating outlines, logical notes, summaries, or reports.

2.5 Follow multiple-step instructions for preparing applications (e.g., for a public library card, bank savings account, sports club, league membership).

Expository Critique

2.6 Determine the adequacy and appropriateness of the evidence for an author’s conclusions. **(CAHSEE)**

2.7 Make reasonable assertions about a text through accurate, supporting citations.

2.8 Note instances of unsupported inferences, fallacious reasoning, persuasion, and propaganda in text.

3.0 Literary Response and Analysis

Structural Features of Literature

3.1 Identify the forms of fiction and describe the major characteristics of each form.

Narrative Analysis of Grade-Level-Appropriate Text

3.2 Analyze the effect of the qualities of the character (e.g., courage or cowardice, ambition or laziness) on the plot and the resolution of the conflict. **(CAHSEE)**

3.3 Analyze the influence of setting on the problem and its resolution.

3.4 Define how tone or meaning is conveyed in poetry through word choice, figurative language, sentence structure, line length, punctuation, rhythm, repetition, and rhyme.

3.5 Identify the speaker and recognize the difference between first- and third-person narration (e.g., autobiography compared with biography).

3.6 Identify and analyze features of themes conveyed through characters, actions, and images.

3.7 Explain the effects of common literary devices (e.g., symbolism, imagery, metaphor) in a variety of fictional and nonfictional texts.

Literary Criticism

3.8 Critique the credibility of characterization and the degree to which a plot is contrived or realistic (e.g., compare use of fact and fantasy in historical fiction).

ENGLISH-LANGUAGE ARTS CONTENT STANDARDS *continued*

GRADE SIX

WRITING

1.0 Writing Strategies

Organization and Focus

1.1	Choose the form of writing (e.g., personal letter, letter to the editor, review, poem, report, narrative) that best suits the intended purpose. (CAHSEE)
1.2	Create multiple-paragraph expository compositions: a. Engage the interest of the reader and state a clear purpose. b. Develop the topic with supporting details and precise verbs, nouns, and adjectives to paint a visual image in the mind of the reader. c. Conclude with a detailed summary linked to the purpose of the composition. (CAHSEE)
1.3	Use a variety of effective and coherent organizational patterns, including comparison and contrast; organization by categories; and arrangement by spatial order, order of importance, or climactic order. (CAHSEE)

Research and Technology

1.4	Use organizational features of electronic text (e.g., bulletin boards, databases, keyword searches, e-mail addresses) to locate information.
1.5	Compose documents with appropriate formatting by using word-processing skills and principles of design (e.g., margins, tabs, spacing, columns, page orientation).

Evaluation and Revision

1.6	Revise writing to improve the organization and consistency of ideas within and between paragraphs. (CAHSEE)
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2.0 Writing Applications (Genres and Their Characteristics)

Using the writing strategies of grade six outlined in Writing Standard 1.0, students:

2.1	Write narratives: a. Establish and develop a plot and setting and present a point of view that is appropriate to the stories. b. Include sensory details and concrete language to develop plot and character. c. Use a range of narrative devices (e.g., dialogue, suspense).
2.2	Write expository compositions (e.g., description, explanation, comparison and contrast, problem and solution): a. State the thesis or purpose. b. Explain the situation. c. Follow an organizational pattern appropriate to the type of composition. d. Offer persuasive evidence to validate arguments and conclusions as needed.
2.3	Write research reports: a. Pose relevant questions with a scope narrow enough to be thoroughly covered. b. Support the main idea or ideas with facts, details, examples, and explanations from multiple authoritative sources (e.g., speakers, periodicals, online information searches). c. Include a bibliography.
2.4	Write responses to literature: a. Develop an interpretation exhibiting careful reading, understanding, and insight. b. Organize the interpretation around several clear ideas, premises, or images. c. Develop and justify the interpretation through sustained use of examples and textual evidence.
2.5	Write persuasive compositions: a. State a clear position on a proposition or proposal. b. Support the position with organized and relevant evidence. c. Anticipate and address reader concerns and counterarguments.

WRITTEN AND ORAL ENGLISH LANGUAGE CONVENTIONS

1.0 Written and Oral English Language Conventions

Sentence Structure

1.1	Use simple, compound, and compound-complex sentences; use effective coordination and subordination of ideas to express complete thoughts.
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Grammar

1.2	Identify and properly use indefinite pronouns and present perfect, past perfect, and future perfect verb tenses; ensure that verbs agree with compound subjects.
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ENGLISH- LANGUAGE ARTS CONTENT STANDARDS *continued*

GRADE SIX

WRITTEN AND ORAL ENGLISH LANGUAGE CONVENTIONS *continued*

1.0 Written and Oral English Language Conventions *continued*

Punctuation

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| 1.3 | Use colons after the salutation in business letters, semicolons to connect independent clauses, and commas when linking two clauses with a conjunction in compound sentences. |
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Capitalization

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| 1.4 | Use correct capitalization. |
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Spelling

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| 1.5 | Spell frequently misspelled words correctly (e.g., <i>their, they're, there</i>). |
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LISTENING AND SPEAKING

1.0 Listening and Speaking Strategies

Comprehension

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| 1.1 | Relate the speaker's verbal communication (e.g., word choice, pitch, feeling, tone) to the nonverbal message (e.g., posture, gesture). |
| 1.2 | Identify the tone, mood, and emotion conveyed in the oral communication. |
| 1.3 | Restate and execute multiple-step oral instructions and directions. |

Organization and Delivery of Oral Communication

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| 1.4 | Select a focus, an organizational structure, and a point of view, matching the purpose, message, occasion, and vocal modulation to the audience. |
| 1.5 | Emphasize salient points to assist the listener in following the main ideas and concepts. |
| 1.6 | Support opinions with detailed evidence and with visual or media displays that use appropriate technology. |
| 1.7 | Use effective rate, volume, pitch, and tone and align nonverbal elements to sustain audience interest and attention. |

Analysis and Evaluation of Oral and Media Communications

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| 1.8 | Analyze the use of rhetorical devices (e.g., cadence, repetitive patterns, use of onomatopoeia) for intent and effect. |
| 1.9 | Identify persuasive and propaganda techniques used in television and identify false and misleading information. |

2.0 Speaking Applications (Genres and Their Characteristics)

Using the speaking strategies of grade six outlined in Listening and Speaking Standard 1.0, students:

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| 2.1 | Deliver narrative presentations:
a. Establish a context, plot, and point of view.
b. Include sensory details and concrete language to develop the plot and character.
c. Use a range of narrative devices (e.g., dialogue, tension, or suspense). |
| 2.2 | Deliver informative presentations:
a. Pose relevant questions sufficiently limited in scope to be completely and thoroughly answered.
b. Develop the topic with facts, details, examples, and explanations from multiple authoritative sources (e.g., speakers, periodicals, online information). |
| 2.3 | Deliver oral responses to literature:
a. Develop an interpretation exhibiting careful reading, understanding, and insight.
b. Organize the selected interpretation around several clear ideas, premises, or images.
c. Develop and justify the selected interpretation through sustained use of examples and textual evidence. |
| 2.4 | Deliver persuasive presentations:
a. Provide a clear statement of the position.
b. Include relevant evidence.
c. Offer a logical sequence of information.
d. Engage the listener and foster acceptance of the proposition or proposal. |
| 2.5 | Deliver presentations on problems and solutions:
a. Theorize on the causes and effects of each problem and establish connections between the defined problem and at least one solution.
b. Offer persuasive evidence to validate the definition of the problem and the proposed solutions. |

MATHEMATICS CONTENT STANDARDS

GRADE SIX

NUMBER SENSE

1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages.

1.1	Compare and order positive and negative fractions, decimals, and mixed numbers and place them on a number line.
1.2	Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations (a/b , a to b , $a:b$).
1.3	Use proportions to solve problems (e.g., determine the value of N if $4/7 = N/21$, find the length of a side of a polygon similar to a known polygon). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse.
1.4	Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.

2.0 Students calculate and solve problems involving addition, subtraction, multiplication, and division.

2.1	Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation.
2.2	Explain the meaning of multiplication and division of positive fractions and perform the calculations (e.g., $\frac{5}{8} \div \frac{15}{16} = \frac{5}{8} \times \frac{16}{15} = \frac{2}{3}$).
2.3	Solve addition, subtraction, multiplication, and division problems, including those arising in concrete situations, that use positive and negative integers and combinations of these operations.
2.4	Determine the least common multiple and the greatest common divisor of whole numbers; use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction).

ALGEBRA AND FUNCTIONS

1.0 Students write verbal expressions and sentences as algebraic expressions and equations; they evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results.

1.1	Write and solve one-step linear equations in one variable.
1.2	Write and evaluate an algebraic expression for a given situation, using up to three variables.
1.3	Apply algebraic order of operations and the commutative, associative, and distributive properties to evaluate expressions; and justify each step in the process.
1.4	Solve problems manually by using the correct order of operations or by using a scientific calculator.

2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions:

2.1	Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).
2.2	Demonstrate an understanding that <i>rate</i> is a measure of one quantity per unit value of another quantity.
2.3	Solve problems involving rates, average speed, distance, and time.

3.0 Students investigate geometric patterns and describe them algebraically.

3.1	Use variables in expressions describing geometric quantities (e.g., $P = 2w + 2l$, $A = \frac{1}{2}bh$, $C = \pi d$ —the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).
3.2	Express in symbolic form simple relationships arising from geometry.

MEASUREMENT AND GEOMETRY

1.0 Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems.

1.1	Understand the concept of a constant such as π ; know the formulas for the circumference and area of a circle.
1.2	Know common estimates of π (3.14; $\frac{22}{7}$) and use these values to estimate and calculate the circumference and the area of circles; compare with actual measurements.
1.3	Know and use the formulas for the volume of triangular prisms and cylinders (area of base \times height); compare these formulas and explain the similarity between them and the formula for the volume of a rectangular solid.

2.0 Students identify and describe the properties of two-dimensional figures.

2.1	Identify angles as vertical, adjacent, complementary, or supplementary and provide descriptions of these terms.
2.2	Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.
2.3	Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).

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(CAHSEE) indicates Standards matching the California High School Exit Exam (CDE/CAHSEE Development Team).

Indicates identified Math Framework Standards to be assessed on the California Achievement Test (CAT/6).

MATHEMATICS CONTENT STANDARDS *continued*

GRADE SIX

STATISTICS, DATA ANALYSIS, AND PROBABILITY

1.0 Students compute and analyze statistical measurements for data sets.

1.1	Compute the range, mean, median, and mode of data sets. (CAHSEE)
1.2	Understand how additional data added to data sets may affect these computations of measures of central tendency.
1.3	Understand how the inclusion or exclusion of outliers affects measures of central tendency.
1.4	Know why a specific measure of central tendency (mean, median, mode) provides the most useful information in a given context.

2.0 Students use data samples of a population and describe the characteristics and limitations of the samples.

2.1	Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.
2.2	Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.
2.3	Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.
2.4	Identify data that represent sampling errors and explain why the sample (and the display) might be biased.
2.5	Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims. (CAHSEE)

3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events.

3.1	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.
3.2	Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).
3.3	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.
3.4	Understand that the probability of either of two disjoint events occurring is the sum of the two individual probabilities and that the probability of one event following another, in independent trials, is the product of the two probabilities.
3.5	Understand the difference between independent and dependent events.

MATHEMATICAL REASONING

1.0 Students make decisions about how to approach problems.

1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.
1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.
1.3	Determine when and how to break a problem into simpler parts.

2.0 Students use strategies, skills, and concepts in finding solutions.

2.1	Use estimation to verify the reasonableness of calculated results.
2.2	Apply strategies and results from simpler problems to more complex problems.
2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
2.4	Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.
2.5	Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.
2.6	Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
2.7	Make precise calculations and check the validity of the results from the context of the problem.

3.0 Students move beyond a particular problem by generalizing to other situations.

3.1	Evaluate the reasonableness of the solution in the context of the original situation.
3.2	Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.
3.3	Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.

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MATHEMATICS CONTENT STANDARDS *continued*

GRADES SIX AND SEVEN PRE ALGEBRA COURSE 1
GRADES SIX THROUGH EIGHT PRE ALGEBRA COURSE 2

NUMBER SENSE

1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms:

1.1	Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (CAHSEE)
1.2	Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers. (CAHSEE)
1.3	Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (CAHSEE)
1.4	Differentiate between rational and irrational numbers.
1.5	Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions.
1.6	Calculate the percentage of increases and decreases of a quantity. (CAHSEE)
1.7	Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest. (CAHSEE)

2.0 Students use exponents, powers, and roots and use exponents in working with fractions:

2.1	Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base. (CAHSEE)
2.2	Add and subtract fractions by using factoring to find common denominators. (CAHSEE)
2.3	Multiply, divide, and simplify rational numbers by using exponent rules.
2.4	Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why.
2.5	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. (CAHSEE)

ALGEBRA AND FUNCTIONS

1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:

1.1	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).
1.2	Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$.
1.3	Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used.
1.4	Use algebraic terminology (e.g., variable, equation, term, coefficient, inequality, expression, constant) correctly.
1.5	Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph.

2.0 Students interpret and evaluate expressions involving integer powers and simple roots:

2.1	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.
2.2	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.

3.0 Students graph and interpret linear and some nonlinear functions:

3.1	Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems.
3.2	Plot the values from the volumes of three-dimensional shapes for various values of the edge lengths (e.g., cubes with varying edge lengths or a triangle prism with a fixed height and an equilateral triangle base of varying lengths).
3.3	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.
3.4	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 and understand that the slope of the line equals the quantities.

4.0 Students solve simple linear equations and inequalities over the rational numbers:

4.1	Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results.
4.2	Solve multistep problems involving rate, average speed, distance, and time or a direct variation.

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MATHEMATICS CONTENT STANDARDS *continued*

GRADES SIX AND SEVEN PRE ALGEBRA COURSE 1
GRADES SIX THROUGH EIGHT PRE ALGEBRA COURSE 2

MEASUREMENT AND GEOMETRY

1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:

1.1	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). (CAHSEE)
1.2	Construct and read drawings and models made to scale.
1.3	Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer. (CAHSEE)

2.0 Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale:

2.1	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, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders.
2.2	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.
2.3	Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and the volume is multiplied by the cube of the scale factor.
2.4	Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or $[1 \text{ ft}^2] = [144 \text{ in}^2]$, 1 cubic inch is approximately 16.38 cubic centimeters or $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$).

3.0 Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures:

3.1	Identify and construct basic elements of geometric figures (e.g., altitudes, midpoints, diagonals, angle bisectors, and perpendicular bisectors; central angles, radii, diameters, and chords of circles) by using a compass and straightedge.
3.2	Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections.
3.3	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 and, in some situations, empirically verify the Pythagorean theorem by direct measurement.
3.4	Demonstrate an understanding of conditions that indicate two geometrical figures are congruent and what congruence means about the relationships between the sides and angles of the two figures.
3.5	Construct two-dimensional patterns for three-dimensional models, such as cylinders, prisms, and cones.
3.6	Identify elements of three-dimensional geometric objects (e.g., diagonals of rectangular solids) and describe how two or more objects are related in space (e.g., skew lines, the possible ways three planes might intersect).

STATISTICS, DATA ANALYSIS, AND PROBABILITY

1.0 Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program:

1.1	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. (CAHSEE)
1.2	Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). (CAHSEE)
1.3	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. (CAHSEE)

MATHEMATICAL REASONING

1.0 Students make decisions about how to approach problems:

1.1	Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. (CAHSEE)
1.2	Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed.
1.3	Determine when and how to break a problem into simpler parts.

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MATHEMATICS CONTENT STANDARDS *continued*

GRADES SIX AND SEVEN PRE ALGEBRA COURSE 1
GRADES SIX THROUGH EIGHT PRE ALGEBRA COURSE 2

MATHEMATICAL REASONING *continued*

2.0 Students use strategies, skills, and concepts in finding solutions:

2.1	Use estimation to verify the reasonableness of calculated results. (CAHSEE)
2.2	Apply strategies and results from simpler problems to more complex problems.
2.3	Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques. (CAHSEE)
2.4	Make and test conjectures by using both inductive and deductive reasoning.
2.5	Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.
2.6	Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.
2.7	Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
2.8	Make precise calculations and check the validity of the results from the context of the problem.

3.0 Students determine a solution is complete and move beyond a particular problem by generalizing to other situations:

3.1	Evaluate the reasonableness of the solution in the context of the original situation.
3.2	Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.
3.3	Develop generalizations of the results obtained and the strategies used and apply them to new problem situations.

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SCIENCE CONTENT STANDARDS

GRADE SIX

FOCUS ON EARTH SCIENCE

Plate Tectonics and Earth's Structure

1. Plate tectonics accounts for important features of Earth's surface and major geologic events. As a basis for understanding this concept:

a.	Students know evidence of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and midocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.
b.	Students know Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.
c.	Students know lithospheric plates the size of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
d.	Students know that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.
e.	Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.
f.	Students know how to explain major features of California geology (including mountains, faults, volcanoes) in terms of plate tectonics.
g.	Students know how to determine the epicenter of an earthquake and know that the effects of an earthquake on any region vary, depending on the size of the earthquake, the distance of the region from the epicenter, the local geology, and the type of construction in the region.

Shaping Earth's Surfaces

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment. As a basis for understanding this concept:

a.	Students know water running downhill is the dominant process in shaping the landscape, including California's landscape.
b.	Students know rivers and streams are dynamic systems that erode, transport sediment, change course, and flood their banks in natural and recurring patterns.
c.	Students know beaches are dynamic systems in which the sand is supplied by rivers and moved along the coast by the action of waves.
d.	Students know earthquakes, volcanic eruptions, landslides, and floods change human and wildlife habitats.

Heat (Thermal Energy) (Physical Science)

3. Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature. As a basis for understanding this concept:

a.	Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.
b.	Students know that when fuel is consumed, most of the energy released becomes heat energy.
c.	Students know heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and by convection (which involves flow of matter).
d.	Students know heat energy is also transferred between objects by radiation (radiation can travel through space).

Energy in the Earth System

4. Many phenomena on Earth's surface are affected by the transfer of energy through radiation and convection currents. As a basis for understanding this concept:

a.	Students know the sun is the major source of energy for phenomena on Earth's surface; it powers winds, ocean currents, and the water cycle.
b.	Students know solar energy reaches Earth through radiation, mostly in the form of visible light.
c.	Students know heat from Earth's interior reaches the surface primarily through convection.
d.	Students know convection currents distribute heat in the atmosphere and oceans.
e.	Students know differences in pressure, heat, air movement, and humidity result in changes of weather.

Ecology (Life Science)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept:

a.	Students know energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis and then from organism to organism through food webs.
b.	Students know matter is transferred over time from one organism to others in the food web and between organisms and the physical environment.
c.	Students know populations of organisms can be categorized by the functions they serve in an ecosystem.
d.	Students know different kinds of organisms may play similar ecological roles in similar biomes.
e.	Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

SCIENCE CONTENT STANDARDS *continued*

GRADE SIX

FOCUS ON EARTH SCIENCE *continued*

Resources

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept:

a.	Students know the utility of energy sources is determined by factors that are involved in converting these sources to useful forms and the consequences of the conversion process.
b.	Students know different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and know how to classify them as renewable or nonrenewable.
c.	Students know the natural origin of the materials used to make common objects.

INVESTIGATION AND EXPERIMENTATION

7. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

a.	Develop a hypothesis.
b.	Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
c.	Construct appropriate graphs from data and develop qualitative statements about the relationships between variables.
d.	Communicate the steps and results from an investigation in written reports and oral presentations.
e.	Recognize whether evidence is consistent with a proposed explanation.
f.	Read a topographic map and a geologic map for evidence provided on the maps and construct and interpret a simple scale map
g.	Interpret events by sequence and time from natural phenomena (e.g., the relative ages of rocks and intrusions).
h.	Identify changes in natural phenomena over time without manipulating the phenomena (e.g., a tree limb, a grove of trees, a stream, a hill slope).

HISTORY-SOCIAL SCIENCE CONTENT STANDARDS

GRADE SIX

WORLD HISTORY AND GEOGRAPHY: ANCIENT CIVILIZATIONS

6.1 Students describe what is known through archaeological studies of the early physical and cultural development of humankind from the Paleolithic era to the agricultural revolution.

1.	Describe the hunter-gatherer societies, including the development of tools and the use of fire.
2.	Identify the locations of human communities that populated the major regions of the world and describe how humans adapted to a variety of environments.
3.	Discuss the climatic changes and human modifications of the physical environment that gave rise to the domestication of plants and animals and new sources of clothing and shelter.

6.2 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of Mesopotamia, Egypt, and Kush.

1.	Locate and describe the major river systems and discuss the physical settings that supported permanent settlement and early civilizations.
2.	Trace the development of agricultural techniques that permitted the production of economic surplus and the emergence of cities as centers of culture and power.
3.	Understand the relationship between religion and the social and political order in Mesopotamia and Egypt.
4.	Know the significance of Hammurabi's Code.
5.	Discuss the main features of Egyptian art and architecture.
6.	Describe the role of Egyptian trade in the eastern Mediterranean and Nile valley.
7.	Understand the significance of Queen Hatshepsut and Ramses the Great.
8.	Identify the location of the Kush civilization and describe its political, commercial, and cultural relations with Egypt.
9.	Trace the evolution of language and its written forms.

6.3 Students analyze the geographic, political, economic, religious, and social structures of the Ancient Hebrews.

1.	Describe the origins and significance of Judaism as the first monotheistic religion based on the concept of one God who sets down moral laws for humanity.
2.	Identify the sources of the ethical teachings and central beliefs of Judaism (the Hebrew Bible, the Commentaries): belief in God, observance of law, practice of the concepts of righteousness and justice, and importance of study; and describe how the ideas of the Hebrew traditions are reflected in the moral and ethical traditions of Western civilization.
3.	Explain the significance of Abraham, Moses, Naomi, Ruth, David, and Yohanan ben Zaccai in the development of the Jewish religion.
4.	Discuss the locations of the settlements and movements of Hebrew peoples, including the Exodus and their movement to and from Egypt, and outline the significance of the Exodus to the Jewish and other people.
5.	Discuss how Judaism survived and developed despite the continuing dispersion of much of the Jewish population from Jerusalem and the rest of Israel after the destruction of the second Temple in A.D. 70.

6.4 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of Ancient Greece.

1.	Discuss the connections between geography and the development of city-states in the region of the Aegean Sea, including patterns of trade and commerce among Greek city-states and within the wider Mediterranean region.
2.	Trace the transition from tyranny and oligarchy to early democratic forms of government and back to dictatorship in ancient Greece, including the significance of the invention of the idea of citizenship (e.g., from <i>Pericles' Funeral Oration</i>).
3.	State the key differences between Athenian, or direct, democracy and representative democracy.
4.	Explain the significance of Greek mythology to the everyday life of people in the region and how Greek literature continues to permeate our literature and language today, drawing from Greek mythology and epics, such as Homer's <i>Iliad</i> and <i>Odyssey</i> , and from <i>Aesop's Fables</i> .
5.	Outline the founding, expansion, and political organization of the Persian Empire.
6.	Compare and contrast life in Athens and Sparta, with emphasis on their roles in the Persian and Peloponnesian Wars.
7.	Trace the rise of Alexander the Great and the spread of Greek culture eastward and into Egypt.
8.	Describe the enduring contributions of important Greek figures in the arts and sciences (e.g., Hypatia, Socrates, Plato, Aristotle, Euclid, Thucydides).

HISTORY-SOCIAL SCIENCE CONTENT STANDARDS *continued*

GRADE SIX

WORLD HISTORY AND GEOGRAPHY: ANCIENT CIVILIZATIONS *continued*

6.5 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of India.

1.	Locate and describe the major river system and discuss the physical setting that supported the rise of this civilization.
2.	Discuss the significance of the Aryan invasions.
3.	Explain the major beliefs and practices of Brahmanism in India and how they evolved into early Hinduism.
4.	Outline the social structure of the caste system.
5.	Know the life and moral teachings of Buddha and how Buddhism spread in India, Ceylon, and Central Asia.
6.	Describe the growth of the Maurya empire and the political and moral achievements of the emperor Asoka.
7.	Discuss important aesthetic and intellectual traditions (e.g., Sanskrit literature, including the <i>Bhagavad Gita</i> ; medicine; metallurgy; and mathematics, including Hindu-Arabic numerals and the zero).

6.6 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of China.

1.	Locate and describe the origins of Chinese civilization in the Huang-He Valley during the Shang Dynasty.
2.	Explain the geographic features of China that made governance and the spread of ideas and goods difficult and served to isolate the country from the rest of the world.
3.	Know about the life of Confucius and the fundamental teachings of Confucianism and Taoism.
4.	Identify the political and cultural problems prevalent in the time of Confucius and how he sought to solve them.
5.	List the policies and achievements of the emperor Shi Huangdi in unifying northern China under the Qin Dynasty.
6.	Detail the political contributions of the Han Dynasty to the development of the imperial bureaucratic state and the expansion of the empire.
7.	Cite the significance of the trans-Eurasian "silk roads" in the period of the Han Dynasty and Roman Empire and their locations.
8.	Describe the diffusion of Buddhism northward to China during the Han Dynasty.

6.7 Students analyze the geographic, political, economic, religious, and social structures during the development of Rome.

1.	Identify the location and describe the rise of the Roman Republic, including the importance of such mythical and historical figures as Aeneas, Romulus and Remus, Cincinnatus, Julius Caesar, and Cicero.
2.	Describe the government of the Roman Republic and its significance (e.g., written constitution and tripartite government, checks and balances, civic duty).
3.	Identify the location of and the political and geographic reasons for the growth of Roman territories and expansion of the empire, including how the empire fostered economic growth through the use of currency and trade routes.
4.	Discuss the influence of Julius Caesar and Augustus in Rome's transition from republic to empire.
5.	Trace the migration of Jews around the Mediterranean region and the effects of their conflict with the Romans, including the Romans' restrictions on their right to live in Jerusalem.
6.	Note the origins of Christianity in the Jewish Messianic prophecies, the life and teachings of Jesus of Nazareth as described in the New Testament, and the contribution of St. Paul the Apostle to the definition and spread of Christian beliefs (e.g., belief in the Trinity, resurrection, salvation).
7.	Describe the circumstances that led to the spread of Christianity in Europe and other Roman territories.
8.	Discuss the legacies of Roman art and architecture, technology and science, literature, language, and law.

HISTORY-SOCIAL SCIENCE ANALYSIS SKILLS (6-8):

Chronological and Spatial Thinking

1.	Students explain how major events are related to one another in time.
2.	Students construct various time lines of key events, people, and periods of the historical era they are studying.
3.	Students use a variety of maps and documents to identify physical and cultural features of neighborhoods, cities, states, and countries and to explain the historical migration of people, expansion and disintegration of empires, and the growth of economic systems.

Research, Evidence, and Point of View

1.	Students frame questions that can be answered by historical study and research.
2.	Students distinguish fact from opinion in historical narratives and stories.
3.	Students distinguish relevant from irrelevant information, essential from incidental information, and verifiable from unverifiable information in historical narratives and stories.
4.	Students assess the credibility of primary and secondary sources and draw sound conclusions from them.
5.	Students detect the different historical points of view on historical events and determine the context in which the historical statements were made (the questions asked, sources used, author's perspectives).

HISTORY-SOCIAL SCIENCE CONTENT STANDARDS *continued*

GRADE SIX

HISTORY-SOCIAL SCIENCE ANALYSIS SKILLS (6-8): *continued*

Historical Interpretation

1.	Students explain the central issues and problems from the past, placing people and events in a matrix of time and place.
2.	Students understand and distinguish cause, effect, sequence, and correlation in historical events, including the long- and short-term causal relations.
3.	Students explain the sources of historical continuity and how the combination of ideas and events explains the emergence of new patterns.
4.	Students recognize the role of chance, oversight, and error in history.
5.	Students recognize that interpretations of history are subject to change as new information is uncovered.
6.	Students interpret basic indicators of economic performance and conduct cost-benefit analyses of economic and political issues.