Grade Six
Content Standards

*Access **Visual & Performing Arts** Standards and **English-Language Development** Standards at www.cde.ca.gov/be/st/ss*

Mathematics

By the end of grade six, students have mastered the four arithmetic operations with whole numbers, positive fractions, positive decimals, and positive and negative integers; they accurately compute and solve problems. They apply their knowledge to statistics and probability. Students understand the concepts of mean, median, and mode of data sets and how to calculate the range. They analyze data and sampling processes for possible bias and misleading conclusions; they use addition and multiplication of fractions routinely to calculate the probabilities for compound events. Students conceptually understand and work with ratios and proportions; they compute percentages (e.g., tax, tips, interest). Students know about pi and the formulas for the circumference and area of a circle. They use letters for numbers in formulas involving geometric shapes and in ratios to represent an unknown part of an expression. They solve one-step linear equations.

Number Sense *(STAR – 39%)*

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., 5/8 ÷ 15/16 = 5/8 x 16/15 = 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 *(STAR – 29%)*

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 *rate* 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., $P = 2w + 2l$, $A = 1/2bh$, $C = \pi d$ - 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 *(STAR – 15%)*

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.

***CA Key standards comprise at least 70% of STAR Test**

1.2 Know common estimates of π (3.14; 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 x 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).

Statistics, Data Analysis, and Probability (STAR – 17%)

1.0 Students compute and analyze statistical measurements for data sets:
1.1** Compute the range, mean, median, and mode of data sets. *(Tested on CA High School Exit Exam)*
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. *(Tested on CA High School Exit Exam)*

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. *(Tested on CA High School Exit Exam)*
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. *(Tested on CA High School Exit Exam)*
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. *(Tested on CA High School Exit Exam)*

Mathematical Reasoning *(STAR – questions embedded in other strands)*

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 ***CA Key standards comprise at least 70% of STAR Test**

r.umbers, 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.

History-Social Science

World History and Geography: Ancient Civilizations

Students in grade six expand their understanding of history by studying the people and events that ushered in the dawn of the major Western and non-Western ancient civilizations. Geography is of special significance in the development of the human story. Continued emphasis is placed on the everyday lives, problems, and accomplishments of people, their role in developing social, economic, and political structures, as well as in establishing and spreading ideas that helped transform the world forever. Students develop higher levels of critical thinking by considering why civilizations developed where and when they did, why they became dominant, and why they declined. Students analyze the interactions among the various cultures, emphasizing their enduring contributions and the link, despite time, between the contemporary and ancient worlds.

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. ***(STAR – 8th Grade*)***

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. ***(STAR – 8th Grade*)***

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. ***(STAR – 8th Grade*)***

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, and law.

background and interests of the audience. They evaluate the content of oral communication.
population from Jerusalem and the rest of Israel after the destruction of the second Temple in A.D. 70.

These standards are tested on the 8th Grade STAR test.

6.4 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of Ancient Greece. ***(STAR – 8th Grade*)***

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 *Pericles' Funeral Oration).*
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 *Iliad* and *Odyssey,* and from *Aesop's Fables.*
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).

6.5 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of India. ***(Star – 8th Grade*)***

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 *Bhagavad Gita;* medicine; metallurgy; and mathematics, including Hindu-Arabic numerals and the zero).

These standards are tested on the 8th Grade STAR test.

6.6 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of China. ***(STAR – 8th Grade*)***

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. ***(STAR – 8th Grade*)***

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

English-Language Arts

All ABC students in 6th Grade will study

The Cay by Theodore Taylor.

Reading

1.0 Word Analysis, Fluency, and Systematic Vocabulary Development ***(STAR – 17%)***

Students use their knowledge of word origins and word relationships, as well as historical and literary context clues, to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level-appropriate words.

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.

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.

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

2.0 Reading Comprehension (Focus on Informational Materials, STAR – 23%*)*

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using their knowledge of text structure, organization, and purpose. The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students. In addition, by grade eight, students read one million words annually on their own, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade six, students continue to make progress toward this goal.

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.

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.

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 ***(STAR – 16%)***

Students read and respond to historically or culturally significant works of literature that reflect and enhance their studies of history and social science. They clarify the ideas and connect them to other literary works. The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students.

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.

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).

Writing

1.0 Writing Strategies ***(STAR – 23%)***

Students write clear, coherent, and focused essays. The writing exhibits students' awareness of the audience and purpose. Essays contain formal introductions, supporting evidence, and conclusions. Students progress through the stages of the writing process as needed.

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.
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.
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.
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.

2.0 Writing Applications **(Genres and Their Characteristics)**
Students write narrative, expository, persuasive, and descriptive texts of at least **500 to 700 words** in each genre. Student writing demonstrates a command of standard American English and the research, organizational, and drafting strategies outlined in Writing Standard 1.0. 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

The standards for written and oral English language conventions have been placed between those for writing and for listening and speaking because these conventions are essential to both sets of skills.
1.0 Written and Oral English Language Conventions
Students write and speak with a command of standard English conventions appropriate to this grade level. ***(STAR – 21%)***
Sentence Structure
1.1 Use simple, compound, and compound-complex sentences; use effective coordination and subordination of ideas to express complete thoughts.
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.
Punctuation
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.
Capitalization
1.4 Use correct capitalization.
Spelling
1.5 Spell frequently misspelled words correctly (e.g., *their, they're, there).*

Listening and Speaking

1.0 Listening and Speaking Strategies
Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Comprehension
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
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
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)**
Students deliver well-organized formal presentations employing traditional rhetorical strategies (e.g., narration, exposition, persuasion, description). Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0. Using the speaking strategies of grade six outlined in Listening and Speaking Standard 1.0, students:
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.

Physical Education
200 minutes of PE instruction each ten school days

Science - 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.
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 Surface

2. Topography is reshaped by the weathering of rock and soil and by the transportation and deposition of sediment.

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.

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.

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.

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. ***(Tested on STAR/NCLB 10th Grade)***
c. Students know populations of organisms can be categorized b the functions they serve in an ecosystem. ***(Tested on STAR/NCLB 10th Grade)***
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. **(*Tested on STAR/NCLB 10th Grade*)**

Resources

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation.

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. ***(Tested on STAR/NCLB 10th Grade)***
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. ***(Tested on STAR/NCLB 10th Grade)***
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 hillslope).