

# SEVENTH GRADE

## CONTENT STANDARDS FOR CALIFORNIA SCHOOLS

# Parent Resource Book

**Designed to Improve  
Student Performance  
through Communication  
and Partnership**

Adapted and Prepared by:

Tehama County Department of Education  
and the Eighteen School Districts of  
Tehama County, California

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Tehama County Department of Education (TCDE) is dedicated to supporting schools and districts as they work to improve student achievement and meet the needs of all learners. The Department provides services and resources to educators, parents, students, and the community. Please visit our website at [www.tehamaschools.org](http://www.tehamaschools.org) for a complete listing of Department offerings. The following programs offer resources that may be especially valuable for parents:

### **Early Childhood Education Programs**

TCDE Early Childhood Education Programs provide leadership and assistance to ensure quality experiences for children ages 0 to 5 years. The goal for these programs is to give young children the tools they need to enter school with a foundation of knowledge and skills that will allow them to be successful throughout their school experience.

Contact: Paula Brown-Almond, Programs Director (530) 528-7343

### **Student Support Services**

TCDE Student Support Services provide residents of Tehama County, health and human service agencies, and schools research, materials, and/or technical assistance in the areas of substance abuse and violence prevention, health education, school safety and crisis planning, as well as resiliency and youth development.

Contact: Amy Henderson, Programs Director (530)528-7357

### **Safe Education and Recreation for Rural Families - SERRF**

SERRF provides a safe, healthy, enriching environment for school children during the after school hours. Homework tutoring, academic enrichment, recreation, social skills development, and prevention activities are all a part of the SERRF Program.

Contact: Karla Stroman, Program Director (530) 528-7392

### **Special Programs**

TCDE provides a wide range of services for children and young adults with special needs. These specialized programs and services are operated at the request of the county school districts, but it is the Individualized Education Plan Team who makes decisions about the type of placement or services a student may be provided.

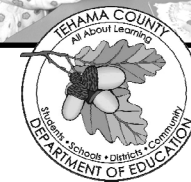
Contact: Heidi Schueller, Assistant Superintendent of Special Programs and Services (530) 528-7248

## Looking For More?

Visit the TCDE website for a wealth of additional information, website links, and other free educational resources...

**[www.tehamaschools.org](http://www.tehamaschools.org)**

- \* **Internet safety information** – teach your children safe browsing skills
- \* **Early childhood education** – programs & resources
- \* **After school activities** – SERRF program, school finder, sponsored events
- \* **Free educational resources** – links to homework help, educational games and other free resources to make learning fun and enriching
- \* **Information for parents** – school safety, emergency notifications
- \* **School performance information** – learn about the schools in Tehama County



## Investigation and Experimentation

### **Scientific Progress is Made by Asking Meaningful Questions and Conducting Investigations**

- Encourage your child to create a science fair project, making sure they include the:
  1. Question ..... The question that they will answer
  2. Hypothesis..... Their first answer to the question
  3. Materials Used..... Items for the experiment
  4. Results..... What really happened
  5. Conclusions ..... What was learned from the experiment.
- Encourage your child to select the appropriate tools to conduct their experiment.
- Encourage your child to make graphs and charts to display data - temperature and/or ingredients for baking.

# The Importance of Parent Involvement and Content Standards

California Content Standards identify what students should know and be able to do at each grade level. They identify what is to be learned. There are standards for the four core academic areas of English Language Arts, Mathematics, History/Social Science, and Science. There are also standards for English Language Development, Physical Education, Health Education, Career Technical Education and the Visual and Performing Arts.

The standards for the four core academic areas are included in this resource booklet as it is important for parents to know what students are expected to learn so learning can be reinforced at home. We know from research that “students with involved parents are more likely to earn higher grades and test scores and enroll in higher-level programs, be promoted, pass their classes, earn credits, attend school regularly, have better social skills, and graduate and go on to postsecondary education.”

Also included in this booklet are suggestions for setting up a home environment to optimize student learning and specific home activities in support of each of the four core areas of language arts, mathematics, history/social science, and science. We know that when parents talk to their children about school, expect them to do well, make sure that out-of-school activities are constructive, and help them plan for college, their children perform better in school.

Unleash the power of this booklet. Become familiar with the standards so you know what your child is expected to learn. Follow the five suggestions for setting up an environment to increase student learning. Engage in the suggested activities to support learning. Have fun learning together!

## **Environment for Student Learning**

**We encourage all parents to set up an environment to increase student learning:**

- 1. Strive to establish an encouraging family atmosphere by:**
  - Acknowledging and supporting your child's efforts.
  - Reinforcing positive behavior.
  - Providing opportunities for service to others.
- 2. Be involved in your child's education by:**
  - Providing help, resources, and encouragement.
  - Showing interest and supporting your child's work.
  - Upholding the school's expectations.
  - Supporting and participating in school service opportunities.
- 3. Set up an atmosphere conducive to learning by:**
  - Scheduling a regular, daily time where all family members are studying.
  - Making sure the house is quiet during this study time.
  - Establishing a location for completing homework that has appropriate lighting and supplies (e.g., paper, pencils, glue, crayons, resources).
  - Assigning a special place to keep school materials.
  - Reviewing the child's homework before it is handed in.
  - Establishing a consistent bedtime.
- 4. Strengthen communication with your child by:**
  - Spending quality time with your child.
  - Sharing resources from your community with your child (e.g., parks, libraries, special buildings).
  - Establishing and enforcing reasonable consequences for misbehavior.
- 5. Be involved in your child's school community by:**
  - Attending parent/teacher conferences.
  - Contacting your child's teacher when questions arise.
  - Spending time in your child's classroom.
  - Attending school functions.

## **Structure and Function in Living Systems**

**Anatomy and Physiology of Plants and Animals Illustrate the Complementary Nature of Structure and Function.**

- Together, make a cardboard and rubber band model of the arm. Cut out two pieces of cardboard and attach rubber bands to the cardboard, representing the biceps and triceps muscles. Move the cardboard back and forth and observe the movement of the rubber bands. Compare this to the movement of the muscles in the arm.
- When shopping at the grocery store, purchase a whole chicken. Together, cut up the chicken before cooking. While cutting the chicken, identify all the structure parts (e.g., leg, knee joint, back bone).
- Together, look at a tulip flower or hibiscus blossom. Encourage your child to identify the structures of the plant. Discuss the yellow powder, what it is, and what's its function.
- Together, discuss the reproductive organs in humans. Talk about how the female organs produce the egg and the male organs produce sperm. Discuss how sexual activity may lead to fertilization and pregnancy.

## **Physical Principles in Living Systems**

**Physical Principles Underlie Biological Structures and Functions**

- Together, fill a wine glass with water. Invite your child to look at an object through the glass and talk about why they think the object appears upside down and backwards.
- Together, explore a lens. Discuss how a lens works and invite your child to list different things that contain a simple lens (e.g., telescope, eye, camera).
- Together, build the three different types of levers (e.g., first class, second class, and third class) and identify the fulcrum, force and weight. Next talk about the different parts of the body that are levers (e.g., the forearm is a third class lever with the elbow being the fulcrum, the muscle attached to the forearm the force, and the hand the weight.).
- Together, do experiments showing that light travels in a straight line (e.g., In a dark room, shine a flashlight in a mirror and see how the light reflects off the mirror at the same angle.).
- Together, talk about fiber optic cables and how these cables can bend light around corners.

## Home Activities for Science

### Focus on Life Science

#### Cell Biology

##### **Living Organisms are Composed of Cells**

- Together, look at books that discuss cells, noting that all things are made of cells and that things grow because of cell division.

#### Genetics

##### **A Typical Cell Contains Genetic Instructions that Specify its Traits**

- Together, build a family tree, going as far back in generations as possible. Invite your child to record such characteristics as color of hair, eye color, height, blood type, etc. Talk about similarities and differences.
- Encourage your child list as many characteristics as he/she can that were inherited from his/her parents. Talk about the fact that each cell contains genetic instructions and character traits.

#### Evolution

##### **Biological Evolution Accounts for the Diversity of Species**

- Together, find pictures showing the evolution of an animal, such as a horse. Note how the animal has changed over time.
- Together, explore the variety of breeds of a certain type of animal (e.g., breeds of dogs, rabbits). Talk about reasons for all these different breeds.
- Together, look at pictures showing how man has changed over the past millennium because of climate, food supply, shelter, medicines, etc.

#### Earth and Life History

##### **Evidence from Rocks Allows us to Understand the Evolution of Life**

- Together, talk about reports of endangered plants and/or animals, discussing what caused the problems and what solutions are being considered.
- Together, talk about the ways in which an organism may become extinct and things we can do to keep this from happening.

## State Standards for English Language Arts

### Reading

#### **1.0 Word Analysis, Fluency, and Systematic Vocabulary Development.**

- 1.1 Identify idioms, analogies, metaphors, and similes in prose and poetry.
- 1.2 Use knowledge of Greek, Latin, and Anglo-Saxon roots and affixes to understand content-area vocabulary.
- 1.3 Clarify word meanings through the use of definition, example, restatement, or contrast.

#### **2.0 Reading Comprehension**

- 2.1 Understand and analyze the differences in structure and purpose between various categories of informational materials (e.g., textbooks, newspapers, instructional manuals, signs).
- 2.2 Locate information by using a variety of consumer, workplace, and public documents.
- 2.3 Analyze text that uses the cause-and-effect organizational pattern.
- 2.4 Identify and trace the development of an author's argument, point of view, or perspective in text.
- 2.5 Understand and explain the use of a simple mechanical device by following technical directions.
- 2.6 Access the adequacy, accuracy, and appropriateness of the author's evidence to support claims and assertions, noting instances of bias and stereotyping.

#### **3.0 Literary Response and Analysis**

- 3.1 Articulate the expressed purposes and characteristics of different forms of prose (e.g., short story, novel, novella, essay).
- 3.2 Identify events that advance the plot and determine how each event explains past or present action(s) or foreshadows future action(s).
- 3.3 Analyze characterizations as delineated through a character's thoughts, words, speech patterns, and actions; the narrator's description; and the thoughts, words, and actions of other characters.
- 3.4 Identify and analyze recurring themes across works (e.g., loyalty, friendship).
- 3.5 Contrast points of view in narrative text and explain how they affect the overall theme of the work.

## **Writing**

### **1.0 Writing Strategies**

- 1.1 Create an organizational structure that balances all aspects of the composition and uses effective transition between sentences to unify important ideas.
- 1.2 Support all statements with anecdotes, descriptions, facts, statistics, and specific examples.
- 1.3 Use strategies of note taking, outlining, and summarizing to improve writing.
- 1.4 Identify topics, asking questions, and developing ideas leading to inquiry, investigation, and research.
- 1.5 Give credit for both quoted and paraphrased information in a bibliography using approved citations.
- 1.6 Create documents using word-processing skills and publishing programs.
- 1.7 Revise the writing to improve organization and word choice, checking the logic of the ideas and precision of vocabulary.

### **2.0 Writing Applications**

- 2.1 Write fictional or autobiographical narratives.
- 2.2 Write responses to literature.
- 2.3 Write research reports.
- 2.4 Write persuasive compositions.
- 2.5 Write summaries of reading materials.

## **Written and Oral English Language Conventions**

### **1.0 Written and Oral English Language Conventions**

- 1.1 Place modifiers properly and using the active voice.
- 1.2 Use infinitives and participles and making clear references between pronouns and antecedents.
- 1.3 Identify all parts of speech, and types of sentences.
- 1.4 Demonstrate the mechanics of writing and appropriate English usage.
- 1.5 Identify hyphens, dashes, brackets, and semicolons and use them correctly.
- 1.6 Use correct capitalization.
- 1.7 Spell derivatives correctly by applying the spellings of bases and affixes.

- i. Know how levers convert mechanical advantage and how the application of this principle applies to the musculoskeletal system.
- j. Know that contractions of the heart generate blood pressure and that heart valves prevent backflow of blood in the circulatory system.

## **Investigation and Experimentation**

### **7. Scientific progress is made by asking meaningful questions and conducting careful investigations.**

- a. Select and use appropriate tools and technology (including calculators, computers, balances, spring scales, microscopes, and binoculars) to perform tests, collect data, and display data.
- b. Use a variety of print and electronic resources (including the World Wide Web) to collect information and evidence as part of a research project.
- c. Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.
- d. Construct scale models, maps, and appropriately labeled diagrams to communicate scientific knowledge (e.g., motion of Earth's plates and cell structure).
- e. Communicate the steps and results from an investigation in written reports and oral presentations.

## **Structure and Function in Living Systems**

### **5. The anatomy and physiology of plants and animals illustrate the complementary nature of structure and function.**

- a. Know that plants and animals have levels of organization for structure and function, including cells, tissues, organs, organ systems, and the whole organism.
- b. Know that organ systems function because of the contributions of individual organs, tissues, and cells. The failure of any part can affect the entire system.
- c. Know how bones and muscles work together to provide a structural framework for movement.
- d. Know how the reproductive organs of the human female and male generate eggs and sperm and how sexual activity may lead to fertilization and pregnancy.
- e. Know the function of the umbilicus and placenta during pregnancy.
- f. Know the structures and processes by which flowering plants generate pollen, ovules, seeds, and fruit.
- g. Know how to relate the structures of the eye and ear to their functions.

## **Physical Principles in Living Systems**

### **6. Physical principles underlie biological structures and functions.**

- a. Know that visible light is a small band within a very broad electromagnetic spectrum.
- b. Know that for an object to be seen, light emitted by or scattered from it must be detected by the eye.
- c. Know that light travels in straight lines if the medium it travels through does not change.
- d. Know how simple lenses are used in a magnifying glass, the eye, a camera, a telescope, and a microscope.
- e. Know that white light is a mixture of many wavelengths (colors) and that retinal cells react differently to different wavelengths.
- f. Know that light can be reflected, refracted, transmitted, and absorbed by matter.
- g. Know that the angle of reflection of a light beam is equal to the angle of incidence.
- h. Know how to compare joints in the body (wrist, shoulder, thigh) with structures used in machines and simple devices (hinge, ball-and-socket, and sliding joints).

## **Listening and Speaking**

### **1.0 Listening and Speaking Strategies**

- 1.1 Ask probing questions to elicit information, including evidence to support the speaker's claims and conclusions.
- 1.2 Determine the speaker's attitude toward the subject.
- 1.3 Respond to persuasive messages with questions, challenges, or affirmations.
- 1.4 Organize information to achieve particular purposes and to appeal to the background and interests of the audience.
- 1.5 Arrange supporting details, reasons, descriptions, and examples effectively and persuasively in relation to the audience.
- 1.6 Use speaking techniques, including voice modulation, inflection, tempo, enunciation, and eye contact, for effective presentations.
- 1.7 Provide constructive feedback to speakers concerning the coherence and logic of a speech's content, delivery, and overall impact upon the listener.
- 1.8 Analyze the effect on the viewer of images, text, and sound in electronic journalism.

### **2.0 Speaking Applications**

- 2.1 Deliver narrative presentations.
- 2.2 Deliver oral summaries of articles and books.
- 2.3 Deliver research presentations.
- 2.4 Deliver persuasive presentations.

## **Activities for Language Arts**

### **Reading**

- Visit the library and/or bookstore together.
- Provide comfortable reading level and age appropriate materials.
- Subscribe to magazines of interest for different members of the family.
- Schedule a family reading time when everyone is reading books, magazines, newspapers, etc.
- Encourage the reading of nonfiction and informational materials.

### **Reading Comprehension**

- Read magazines, newspapers, and editorials on current events and discuss point of view of the author/speaker and compare it to your point of view.
- After reading a story, ask questions about it.
- Talk together about the plot, climax, and outcome of text.

### **Writing**

- Encourage your child to write about daily events in their journal.
- Encourage your child to write summaries of T.V. programs, plays, productions, critiques, evaluations, etc.
- Encourage creative writing including poems, short stories, etc.
- Invite your child to use technology to communicate to others.
- Invite your child to use a computer for writing, using the capabilities of the machine to enhance the writing.

### **Written and Oral English Language Conventions**

- Edit/correct errors found in the newspaper.
- Gently supervise your child editing letters they have written, looking for correct punctuation, capitalization, grammar, and sentence structure. Celebrate the writing.
- Use computer software to enhance writing (e.g., grammar/spelling checker).

- a. Know that both genetic variation and environmental factors are causes of evolution and diversity of organisms.
- b. Know the reasoning used by Charles Darwin in reaching his conclusion that natural selection is the mechanism of evolution.
- c. Know how independent lines of evidence from geology, fossils, and comparative anatomy provide the bases for the theory of evolution.
- d. Know how to construct a simple branching diagram to classify living groups of organisms by shared derived characteristics and how to expand the diagram to include fossil organisms.
- e. Know that extinction of a species occurs when the environment changes and that the adaptive characteristics of a species are insufficient for its survival.

### **Earth and Life History**

#### **4. Evidence from rocks allows us to understand the evolution of life on Earth.**

- a. Know Earth processes today are similar to those that occurred in the past and slow geologic processes have large cumulative effects over long periods of time.
- b. Know the history of life on Earth has been disrupted by major catastrophic events, such as major volcanic eruptions or the impacts of asteroids.
- c. Know that the rock cycle includes the formation of new sediment and rocks and that rocks are often found in layers, with the oldest generally on the bottom.
- d. Know that evidence from geologic layers and radioactive dating indicates Earth is approximately 4.6 billion years old and that life on this planet has existed for more than 3 billion years.
- e. Know fossils provide evidence of how life and environmental conditions have changed.
- f. Know how movements of Earth's continental and oceanic plates through time, with associated changes in climate and geographic connections, have affected the past and present distribution of organisms.
- g. Know how to explain significant developments and extinctions of plant and animal life on the geologic time scale.

# State Standards for Science

## Focus on Life Science

### Cell Biology

1. **All living organisms are composed of cells, from just one to many trillions, whose details usually are visible only through a microscope.**
  - a. Know the cells function similarly in all living organisms.
  - b. Know the characteristics that distinguish plant cells from animal cells, including chloroplasts and cell walls.
  - c. Know that the nucleus is the repository for genetic information in plant and animal cells.
  - d. Know that mitochondria liberate energy for the work that cells do and that chloroplasts capture sunlight energy for photosynthesis.
  - e. Know that cells divide to increase their numbers through a process of mitosis, which results in two daughter cells with identical sets of chromosomes.
  - f. Know that as multicellular organisms develop, their cells differentiate.

### Genetics

2. **A typical cell of any organism contains genetic instructions that specify its traits. Those traits may be modified by environmental influences.**
  - a. Students know the differences between the life cycles and reproduction methods of sexual and asexual organisms.
  - b. Students know sexual reproduction produces offspring that inherit half their genes from each parent.
  - c. Students know an inherited trait can be determined by one or more genes.
  - d. Students know plant and animal cells contain many thousands of different genes and typically have two copies of every gene. The two copies (or alleles) of the gene may or may not be identical, and one may be dominant in determining the phenotype while the other is recessive.
  - e. Students know DNA (deoxyribonucleic acid) is the genetic material of living organisms and is located in the chromosomes of each cell.

### Evolution

3. **Biological evolution accounts for the diversity of species developed through gradual processes over many generations.**

## Listening and Speaking

- Invite your child to read material aloud. Listen for voice inflections, seeing if the tone of the voice fits the theme being read.
- Encourage your child to create and put on a play by themselves or with friends.
- Encourage your child to listen to and explain the lyrics of a selection of music.
- Listen to books on tape, speeches, poetry, etc. together.
- Encourage the memorization of good literature, poems, etc.

## **State Standards for Mathematics**

### **Number Sense**

#### **1.0 Computing**

- 1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation.
- 1.2 Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers.
- 1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications.
- 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.
- 1.7 Solve problems involving discounts, markups, commissions, and profit and compute simple and compound interest.

#### **2.0 Fractions**

- 2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base.
- 2.2 Add and subtract fractions by using factoring to find common denominators.
- 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.

### **Compare the Meso-American and Andean Civilizations.**

- On a map of the world, locate Mexico, Central America, South America, the Andes Mountains and the Amazon basin together. Talk about what people in the family know about this area.
- Before taking a trip to the mountains, invite your child to run 100 yards then talk about how he/she feels. When arriving in the mountains, invite your child to again run 100 yards and talk about how he/she feels. Discuss running at the different altitudes and how professional football players, for example, have to adapt to high elevations when playing in Denver, CO.
- Plan and cook a Mexican meal together.
- While traveling, look for & discuss Mexican art in California.

### **Analyze the Origins, Accomplishments, and Geographic Diffusion of the Renaissance.**

- Look up the word "Renaissance" in the dictionary and discuss the definition together.
- Discuss together how Leonardo da Vinci developed plans for mechanical devices, such as the helicopter. Build a model using a set of plans (e.g., a model airplane, model car).
- Have each member of the family develop a set of plans for a bridge. Using simple materials (e.g., sugar cubes, tooth picks, popsicle sticks) have each person build their bridge. Put different weights on each bridge to determine the strongest one. Award a prize for the strongest bridge.
- Visit a newspaper office and see the technique used for printing. Compare this process to the Gutenberg printing press.
- Find a map of Asia, Europe, and northern Africa, and note the trade routes (e.g., the "Silk Road" and the travels of Marco Polo).
- Visit a museum together and note the artwork and the signature of the artist. Discuss together the fact that the Renaissance period was the first time in history that people were recognized as individuals (e.g., signing his/her name to a painting).
- On your next trip, talk together about the different types of architecture (e.g., Spanish, Roman, Western, Oriental).
- Invite your child to create a word search including 20 names of people and cities influential in the Renaissance period.

Reformation, and the Scientific Revolution and to the Greeks, Romans, and Christianity.

- Describe how democratic thought and institutions were influenced by Enlightenment thinkers (e.g., John Locke, Charles-Louis Montesquieu, American founders).
- Discuss how the principles in the Magna Carta were embodied in such documents as the English Bill of Rights and the American Declaration of Independence.

## **Home Activities for History–Social Science**

### **Causes and Effects of the Expansion and Disintegration of the Roman Empire**

- Discuss some of the reasons why the Roman Empire took over the “then known world.” Discuss climate, geography, vast amount of coastline, agriculture, closeness to major waterways, etc.
- Talk about reasons why the Roman Empire might have collapsed. Include; (1) democratic government was taken over by an emperor with ultimate power, (2) the empire was so large it was unmanageable, and (3) the revolution by the slaves.

### **Explore the Structures of the Civilization of Islam, China, Ghana, Africa, Japan, and Europe, in the Middle Ages**

- Make a map of Asia, Europe, and northern Africa. Include major mountain ranges, rivers, and oceans. Identify the goods that each of the countries traded and put these on the map.
- Look around the house, identify the different items (e.g., piano keys, spices, gun powder, tea, salt) and identify what country they came from.
- For fun, invite your child to cook one meal without using any seasoning. Discuss the flavor of the food and how food might have tasted in the early days if the countries had not traded spices.
- The political structure of the Eastern Hemisphere, during the middle ages, was ruled by the rich and educated people. In your family, play the computer game of “Who Wants to be a Millionaire.” Each family member plays 3 games each. At the end of this time, the person with the highest winnings becomes the educated ruler of the family for a weekend. Talk about how it felt being ruled by the most educated person in the family.

## **Algebra and Functions**

### **1.0 Writing Expressions**

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

### **2.0 Evaluating Expressions**

- 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.
- Multiply and divide monomials; extending the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent.

### **3.0 Linear and Nonlinear Functions**

- Graph functions of the form  $y = nx^2$  and  $y = nx^3$  and using in solving problems.
- 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).
- 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.
- 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 Linear Equations

- 4.1 Solve two-step linear equations and inequalities in one variable over the rational number, 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.

#### Measurement and Geometry

##### 1.0 Measurement

- 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).
- 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.

##### 2.0 Perimeter and Area

- 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  $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$ ).

other parts of the world in the medieval and early modern periods; locate missions on a world map.

7. Describe the Golden Age of cooperation between Jews and Muslims in medieval Spain that promoted creativity in art, literature, and science, including how that cooperation was terminated by the religious persecution of individuals and groups (e.g., the Spanish Inquisition and the expulsion of Jews and Muslims from Spain in 1492).

#### 7.10 Students analyze the historical developments of the Scientific Revolution and its lasting effect on religious, political, and cultural institutions.

1. Discuss the roots of the Scientific Revolution (e.g., Greek rationalism; Jewish, Christian, and Muslim science; Renaissance humanism; new knowledge from global exploration).
2. Understand the significance of the new scientific theories (e.g., those of Copernicus, Galileo, Kepler, Newton) and the significance of new inventions (e.g., the telescope, microscope, thermometer, barometer).
3. Understand the scientific method advanced by Bacon and Descartes, the influence of new scientific rationalism on the growth of democratic ideas, and the coexistence of science with traditional religious beliefs.

#### 7.11 Students analyze political and economic change in the sixteenth, seventeenth, and eighteenth centuries (the Age of Exploration, the Enlightenment, and the Age of Reason).

1. Know the great voyages of discovery, the locations of the routes, and the influence of cartography in the development of a new European worldview.
2. Discuss the exchanges of plants, animals, technology, culture, and ideas among Europe, Africa, Asia, and the Americas in the fifteenth and sixteenth centuries and the major economic and social effects on each continent.
3. Examine the origins of modern capitalism; the influence of mercantilism and cottage industry; the elements and importance of a market economy in seventeenth-century Europe; the changing international trading and marketing patterns, including their locations on a world map; and the influence of explorers and map makers.
4. Explain how the main ideas of the Enlightenment can be traced back to such movements as the Renaissance, the

### **7.8 Students analyze the origins, accomplishments, and geographic diffusion of the Renaissance.**

1. Describe the way in which the revival of classical learning and the arts fostered a new interest in humanism (i.e., a balance between intellect and religious faith).
2. Explain the importance of Florence in the early stages of the Renaissance and the growth of independent trading cities (e.g., Venice), with emphasis on the cities' importance in the spread of Renaissance ideas.
3. Understand the effects of the reopening of the ancient "Silk Road" between Europe and China, including Marco Polo's travels and the location of his routes.
4. Describe the growth and effects of new ways of disseminating information (e.g., the ability to manufacture paper, translation of the Bible into the vernacular, printing).
5. Detail advances made in literature, the arts, science, mathematics, cartography, engineering, and the understanding of human anatomy and astronomy (e.g., by Dante Alighieri, Leonardo da Vinci, Michelangelo di Buonarroti Simoni, Johann Gutenberg, William Shakespeare).

### **7.9 Students analyze the historical developments of the Reformation.**

1. List the causes for the internal turmoil in and weakening of the Catholic church (e.g., tax policies, selling of indulgences).
2. Describe the theological, political, and economic ideas of the major figures during the Reformation (e.g., Desiderius Erasmus, Martin Luther, John Calvin, William Tyndale).
3. Explain Protestants' new practices of church self-government and the influence of those practices on the development of democratic practices and ideas of federalism.
4. Identify and locate the European regions that remained Catholic and those that became Protestant and explain how the division affected the distribution of religions in the New World.
5. Analyze how the Counter-Reformation revitalized the Catholic church and the forces that fostered the movement (e.g., St. Ignatius of Loyola and the Jesuits, the Council of Trent).

### **3.0 Geometry**

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, determining lengths and area relating 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 verifying 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 describing 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 Data**

- 1.1 Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; using the forms to display a single set of data or to compare two sets of data.
- 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).
- 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.

### **Mathematical Reasoning**

#### **1.0 Make Decisions about a Problem**

- 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 Solving Problems and Justifying Reasoning**

- 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 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.
- 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 Make Connections**

- 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.

## **Home Activities for Mathematics**

### **Number Sense**

- When shopping, provide your child real and practical experiences such as calculating discounts, determining the better buy, and figuring change.
- When cooking, invite your child to change a recipe by doubling or cutting the amounts in half.

5. Know the significance of developments in medieval English legal and constitutional practices and their importance in the rise of modern democratic thought and representative institutions (e.g., Magna Carta, parliament, development of habeas corpus, an independent judiciary in England).
6. Discuss the causes and course of the religious Crusades and their effects on the Christian, Muslim, and Jewish populations in Europe, with emphasis on the increasing contact by Europeans with cultures of the Eastern Mediterranean world.
7. Map the spread of the bubonic plague from Central Asia to China, the Middle East, and Europe and describe its impact on global population.
8. Understand the importance of the Catholic church as a political, intellectual, and aesthetic institution (e.g., founding of universities, political and spiritual roles of the clergy, creation of monastic and mendicant religious orders, preservation of the Latin language and religious texts, St. Thomas Aquinas's synthesis of classical philosophy with Christian theology, and the concept of "natural law").
9. Know the history of the decline of Muslim rule in the Iberian Peninsula that culminated in the Reconquista and the rise of Spanish and Portuguese kingdoms.

## **7.7 Students compare and contrast the geographic, political, economic, religious, and social structures of the Meso-American and Andean civilizations.**

1. Study the locations, landforms, and climates of Mexico, Central America, and South America and their effects on Mayan, Aztec, and Incan economies, trade, and development of urban societies.
2. Study the roles of people in each society, including class structures, family life, warfare, religious beliefs and practices, and slavery.
3. Explain how and where each empire arose and how the Aztec and Incan empires were defeated by the Spanish.
4. Describe the artistic and oral traditions and architecture in the three civilizations.
5. Describe the Meso-American achievements in astronomy and mathematics, including the development of the calendar and the Meso-American knowledge of seasonal changes to the civilizations' agricultural systems.

5. Describe the importance of written and oral traditions in the transmission of African history and culture.

### **7.5 Students analyze the geographic, political, economic, religious, and social structures of the civilizations of Medieval Japan.**

1. Describe the significance of Japan's proximity to China and Korea and the intellectual, linguistic, religious, and philosophical influence of those countries on Japan.
2. Discuss the reign of Prince Shotoku of Japan and the characteristics of Japanese society and family life during his reign.
3. Describe the values, social customs, and traditions prescribed by the lord-vassal system consisting of *shogun*, *daimyo*, and *samurai* and the lasting influence of the warrior code in the twentieth century.
4. Trace the development of distinctive forms of Japanese Buddhism.
5. Study the ninth and tenth centuries' golden age of literature, art, and drama and its lasting effects on culture today, including Murasaki Shikibu's *Tale of Genji*.
6. Analyze the rise of a military society in the late twelfth century and the role of the samurai in that society.

### **7.6 Students analyze the geographic, political, economic, religious, and social structures of the civilizations of Medieval Europe.**

1. Study the geography of the Europe and the Eurasian land mass, including its location, topography, waterways, vegetation, and climate and their relationship to ways of life in Medieval Europe.
2. Describe the spread of Christianity north of the Alps and the roles played by the early church and by monasteries in its diffusion after the fall of the western half of the Roman Empire.
3. Understand the development of feudalism, its role in the medieval European economy, the way in which it was influenced by physical geography (the role of the manor and the growth of towns), and how feudal relationships provided the foundation of political order.
4. Demonstrate an understanding of the conflict and cooperation between the Papacy and European monarchs (e.g., Charlemagne, Gregory VII, Emperor Henry IV).

- Encourage your child to open a savings account. Next invite your child to calculate interest, fees, and penalties.

### **Algebra and Functions**

- Encourage your child to create and solve problems using department store ads (e.g., Find three items that total \$50.00 including tax.).
- Encourage your child to solve problems that have multiple solutions (e.g., How many ways can you make a double dip ice cream cone given 5 flavors of ice cream?).

### **Measurement and Geometry**

- Together, build projects (e.g., sewing, woodwork, crafts, tile floors, anything requiring a design) using geometry, area, and circumference.
- Work with your child in planning home improvement projects that require measuring, using standard and metric units (e.g., building a cabinet, determining square footage of a room before painting).
- Encourage your child to make a scale map of your block, house, etc.

### **Statistics, Data Analysis, and Probability**

- Encourage your child to calculate averages for sports (e.g., free throw percentage, baseball averages, rushing average, passing percentage, quarterback ratings).
- Encourage your child to calculate and graph calorie intake per meal or per day.
- Together, design and build carnival type games and state the probability for winning each game (e.g., When rolling one die, the probability of rolling a five is one chance in six because there are six sides on the dice). Next have friends play each of the games and invite your children to compare the number of times they won with the projected probability.

### **Mathematical Reasoning**

- Encourage your child to play strategy games (e.g., Battleship on a coordinate grid, chess).
- Encourage your child to solve puzzles (e.g., riddles, crossword).
- Encourage your child to plan a family budget.
- Purchase a logic book for your child and invite him/her to solve the problems.

## **State Standards for History–Social Science**

### **World History and Geography: Medieval and Early Modern Times**

#### **7.1 Students analyze the causes and effects of the vast expansion and ultimate disintegration of the Roman Empire.**

1. Study the early strengths and lasting contributions of Rome (e.g., significance of Roman citizenship; rights under Roman law; Roman art, architecture, engineering, and philosophy; preservation and transmission of Christianity) and its ultimate internal weaknesses (e.g., rise of autonomous military powers within the empire, undermining of citizenship by the growth of corruption and slavery, lack of education, and distribution of news).
2. Discuss the geographic borders of the empire at its height and the factors that threatened its territorial cohesion.
3. Describe the establishment by Constantine of the new capital in Constantinople and the development of the Byzantine Empire, with an emphasis on the consequences of the development of two distinct European civilizations, Eastern Orthodox and Roman Catholic, and their two distinct views on church-state relations.

#### **7.2 Students analyze the geographic, political, economic, religious, and social structures of the civilizations of Islam in the Middle Ages.**

1. Identify the physical features and describe the climate of the Arabian peninsula, its relationship to surrounding bodies of land and water, and nomadic and sedentary ways of life.
2. Trace the origins of Islam and the life and teachings of Muhammad, including Islamic teachings on the connection with Judaism and Christianity.
3. Explain the significance of the Qur'an and the Sunnah as the primary sources of Islamic beliefs, practice, and law, and their influence in Muslims' daily life.
4. Discuss the expansion of Muslim rule through military conquests and treaties, emphasizing the cultural blending within Muslim civilization and the spread and acceptance of Islam and the Arabic language.
5. Describe the growth of cities and the establishment of trade routes among Asia, Africa, and Europe, the products and

inventions that traveled along these routes (e.g., spices, textiles, paper, steel, new crops), and the role of merchants in Arab society.

6. Understand the intellectual exchanges among Muslim scholars of Eurasia and Africa and the contributions Muslim scholars made to later civilizations in the areas of science, geography, mathematics, philosophy, medicine, art, and literature.

#### **7.3 Students analyze the geographic, political, economic, religious, and social structures of the civilizations of China in the Middle Ages**

1. Describe the reunification of China under the Tang Dynasty and reasons for the spread of Buddhism in Tang China, Korea, and Japan.
2. Describe agricultural, technological, and commercial developments during the Tang and Sung periods.
3. Analyze the influences of Confucianism and changes in Confucian thought during the Sung and Mongol periods.
4. Understand the importance of both overland trade and maritime expeditions between China and other civilizations in the Mongol Ascendancy and Ming Dynasty.
5. Trace the historic influence of such discoveries as tea, the manufacture of paper, woodblock printing, the compass, and gunpowder.
6. Describe the development of the imperial state and the scholar-official class.

#### **7.4 Students analyze the geographic, political, economic, religious, and social structures of the sub-Saharan civilizations of Ghana and Mali in Medieval Africa.**

1. Study the Niger River and the relationship of vegetation zones of forest, savannah, and desert to trade in gold, salt, food, and slaves; and the growth of the Ghana and Mali empires.
2. Analyze the importance of family, labor specialization, and regional commerce in the development of states and cities in West Africa.
3. Describe the role of the trans-Saharan caravan trade in the changing religious and cultural characteristics of West Africa and the influence of Islamic beliefs, ethics, and law.
4. Trace the growth of the Arabic language in government, trade, and Islamic scholarship in West Africa.