

California Science Content Standards	Presentation
Kindergarten	
Physical Sciences	
1. Properties of materials can be observed, measured, and predicted. As a basis for understanding this concept:	
a. Students know objects can be described in terms of the materials they are made of (e.g., clay, cloth, paper) and their physical properties (e.g., color, size, shape, weight, texture, flexibility, attraction to magnets, floating, sinking).	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets
b. Students know water can be a liquid or a solid and can be made to change back and forth from one form to the other.	Hot and Cold
c. Students know water left in an open container evaporates (goes into the air) but water in a closed container does not.	
Life Sciences	
2. Different types of plants and animals inhabit the earth. As a basis for understanding this concept:	
a. Students know how to observe and describe similarities and differences in the appearance and behavior of plants and animals (e.g., seed-bearing plants, birds, fish, insects).	Animals and Plants
b. Students know stories sometimes give plants and animals attributes they do not really have.	
c. Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).	Animals and Plants Growing Plants
Earth Sciences	
3. Earth is composed of land, air, and water. As a basis for understanding this concept:	
a. Students know characteristics of mountains, rivers, oceans, valleys, deserts, and local landforms.	
b. Students know changes in weather occur from day to day and across seasons, affecting Earth and its inhabitants.	Weather
c. Students know how to identify resources from Earth that are used in everyday life and understand that many resources can be conserved.	Changing Materials
Investigation and Experimentation	
4. 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. Observe common objects by using the five senses.	Senses

K-2 Product

3-5 Product

b. Describe the properties of common objects.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets
c. Describe the relative position of objects by using one reference (e.g., above or below).	
d. Compare and sort common objects by one physical attribute (e.g., color, shape, texture, size, weight).	Marvellous Materials
e. Communicate observations orally and through drawings.	Marvellous Materials Materials Matter Changing Materials Mysterious Magnets
Grade One	
Physical Sciences	
1. Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:	
a. Students know solids, liquids, and gases have different properties.	Changing State
b. Students know the properties of substances can change when the substances are mixed, cooled, or heated.	Hot and Cold
Life Sciences	
2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:	
a. Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.	Living Things Habitats
b. Students know both plants and animals need water, animals need food, and plants need light.	Living Things
c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.	Habitats
d. Students know how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).	Adaptations
e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.	Growing Plants
Earth Sciences	
3. Weather can be observed, measured, and described. As a basis for understanding this concept:	
a. Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.	Weather

b. Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.	Weather
c. Students know the sun warms the land, air, and water.	Weather
Investigation and Experimentation	
4. 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. Draw pictures that portray some features of the thing being described.	Changing Materials Senses Living Things Light and Dark
b. Record observations and data with pictures, numbers, or written statements.	Changing Materials Senses Living Things Light and Dark Springs
c. Record observations on a bar graph.	Senses
d. Describe the relative position of objects by using two references (e.g., above and next to, below and left of).	
e. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.	
Grade Two	
Physical Sciences	
1. The motion of objects can be observed and measured. As a basis for understanding this concept:	
a. Students know the position of an object can be described by locating it in relation to another object or to the background.	
b. Students know an object's motion can be described by recording the change in position of the object over time.	
c. Students know the way to change how something is moving is by giving it a push or a pull. The size of the change is related to the strength, or the amount of force, of the push or pull.	Feel the Force Springs
d. Students know tools and machines are used to apply pushes and pulls (forces) to make things move.	Feel the Force Magnets Springs
e. Students know objects fall to the ground unless something holds them up.	

f. Students know magnets can be used to make some objects move without being touched.	Magnets
g. Students know sound is made by vibrating objects and can be described by its pitch and volume.	Sounds
Life Sciences	
2. Plants and animals have predictable life cycles. As a basis for understanding this concept:	
a. Students know that organisms reproduce offspring of their own kind and that the offspring resemble their parents and one another.	Growing Up
b. Students know the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice.	Growing Up
c. Students know many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.	Adaptations
d. Students know there is variation among individuals of one kind within a population.	Adaptations
e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.	Growing Plants Plant Reproduction
f. Students know flowers and fruits are associated with reproduction in plants.	Plant Reproduction
Earth Sciences	
3. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:	
a. Students know how to compare the physical properties of different kinds of rocks and know that rock is composed of different combinations of minerals.	Rocks
b. Students know smaller rocks come from the breakage and weathering of larger rocks.	Erosion, Transportation and Deposition
c. Students know that soil is made partly from weathered rock and partly from organic materials and that soils differ in their color, texture, capacity to retain water, and ability to support the growth of many kinds of plants.	Soil
d. Students know that fossils provide evidence about the plants and animals that lived long ago and that scientists learn about the past history of Earth by studying fossils.	Fossils
e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.	Pollution Growing Plants
Investigation and Experimentation	
4. 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. Make predictions based on observed patterns and not random guessing.	Living Things Growing Plants Shadows

b. Measure length, weight, temperature, and liquid volume with appropriate tools and express those measurements in standard metric system units.	
c. Compare and sort common objects according to two or more physical attributes (e.g., color, shape, texture, size, weight).	Marvellous Materials Materials Matter Rocks
d. Write or draw descriptions of a sequence of steps, events, and observations.	Changing Materials Senses Living Things Light and Dark
e. Construct bar graphs to record data, using appropriately labeled axes.	Senses
f. Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects.	Microorganisms
g. Follow oral instructions for a scientific investigation.	
Grade Three	
Physical Sciences	
1. Energy and matter have multiple forms and can be changed from one form to another. As a basis for understanding this concept:	
a. Students know energy comes from the Sun to Earth in the form of light.	Food Chains
b. Students know sources of stored energy take many forms, such as food, fuel, and batteries.	Energy Forms
c. Students know machines and living things convert stored energy to motion and heat.	Food Chains Energy Forms
d. Students know energy can be carried from one place to another by waves, such as water waves and sound waves, by electric current, and by moving objects.	Energy Forms Sounds
e. Students know matter has three forms: solid, liquid, and gas.	Changing State
f. Students know evaporation and melting are changes that occur when the objects are heated.	Changing State
g. Students know that when two or more substances are combined, a new substance may be formed with properties that are different from those of the original materials.	Separating Mixtures
h. Students know all matter is made of small particles called atoms, too small to see with the naked eye.	
i. Students know people once thought that earth, wind, fire, and water were the basic elements that made up all matter. Science experiments show that there are more than 100 different types of atoms, which are presented on the periodic table of the elements.	
2. Light has a source and travels in a direction. As a basis for understanding this concept:	
a. Students know sunlight can be blocked to create shadows.	Shadows Light and Dark
b. Students know light is reflected from mirrors and other surfaces.	Reflection and Refraction

c. Students know the color of light striking an object affects the way the object is seen.	
d. Students know an object is seen when light traveling from the object enters the eye.	Reflection and Refraction
Life Sciences	
3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:	
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.	Growing Plants Plant Reproduction Body Systems Adaptations
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.	Habitats Adaptations
c. Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.	Interdependence Pollution Habitats
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.	Adaptations Interdependence
e. Students know that some kinds of organisms that once lived on Earth have completely disappeared and that some of those resembled others that are alive today.	Fossils
Earth Sciences	
4. Objects in the sky move in regular and predictable patterns. As a basis for understanding this concept:	
a. Students know the patterns of stars stay the same, although they appear to move across the sky nightly, and different stars can be seen in different seasons.	Our Solar System
b. Students know the way in which the Moon's appearance changes during the four-week lunar cycle.	The Moon
c. Students know telescopes magnify the appearance of some distant objects in the sky, including the Moon and the planets. The number of stars that can be seen through telescopes is dramatically greater than the number that can be seen by the unaided eye.	Our Solar System
d. Students know that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.	Our Solar System
e. Students know the position of the Sun in the sky changes during the course of the day and from season to season.	Days and Seasons
Investigation and Experimentation	

<p>5. 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:</p>	
<p>a. Repeat observations to improve accuracy and know that the results of similar scientific investigations seldom turn out exactly the same because of differences in the things being investigated, methods being used, or uncertainty in the observation.</p>	
<p>b. Differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.</p>	<p>Insulators and Conductors Separating Mixtures Friction Plant Reproduction Days and Seasons</p>
<p>c. Use numerical data in describing and comparing objects, events, and measurements.</p>	<p>Friction Forces Water Cycle</p>
<p>d. Predict the outcome of a simple investigation and compare the result with the prediction.</p>	<p>Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces</p>
<p>e. Collect data in an investigation and analyze those data to develop a logical conclusion.</p>	<p>Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces</p>
<p>Grade Four</p>	
<p>Physical Sciences</p>	
<p>1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:</p>	
<p>a. Students know how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.</p>	<p>Circuits</p>
<p>b. Students know how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.</p>	

c. Students know electric currents produce magnetic fields and know how to build a simple electromagnet.	Electromagnets
d. Students know the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.	Electromagnets
e. Students know electrically charged objects attract or repel each other.	Electromagnets
f. Students know that magnets have two poles (north and south) and that like poles repel each other while unlike poles attract each other.	Magnets Electromagnets
g. Students know electrical energy can be converted to heat, light, and motion.	Energy Forms
Life Sciences	
2. All organisms need energy and matter to live and grow. As a basis for understanding this concept:	
a. Students know plants are the primary source of matter and energy entering most food chains.	Food Chains
b. Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.	Food Chains Interdependence
c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.	Microorganisms
3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:	
a. Students know ecosystems can be characterized by their living and nonliving components.	
b. Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.	Habitats Adaptations Interdependence
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.	Interdependence Plant Reproduction
d. Students know that most microorganisms do not cause disease and that many are beneficial.	Microorganisms
Earth Sciences	
4. The properties of rocks and minerals reflect the processes that formed them. As a basis for understanding this concept:	
a. Students know how to differentiate among igneous, sedimentary, and metamorphic rocks by referring to their properties and methods of formation (the rock cycle).	
b. Students know how to identify common rock-forming minerals (including quartz, calcite, feldspar, mica, and hornblende) and ore minerals by using a table of diagnostic properties.	
5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:	

a. Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.	Erosion, Transportation and Deposition
b. Students know natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.	Erosion, Transportation and Deposition
c. Students know moving water erodes landforms, reshaping the land by taking it away from some places and depositing it as pebbles, sand, silt, and mud in other places (weathering, transport, and deposition).	Erosion, Transportation and Deposition
Investigation and Experimentation	
6. 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. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces Days and Seasons
b. Measure and estimate the weight, length, or volume of objects.	Gravity
c. Formulate and justify predictions based on cause-and-effect relationships.	Separating Mixtures Friction Circuits Plant Reproduction Sounds Forces
d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces Sounds Days and Seasons

e. Construct and interpret graphs from measurements.	Friction Forces
f. Follow a set of written instructions for a scientific investigation.	Forces
Grade Five	
Physical Sciences	
1. Elements and their combinations account for all the varied types of matter in the world. As a basis for understanding this concept:	
a. Students know that during chemical reactions the atoms in the reactants rearrange to form products with different properties.	
b. Students know all matter is made of atoms, which may combine to form molecules.	
c. Students know metals have properties in common, such as high electrical and thermal conductivity. Some metals, such as aluminum (Al), iron (Fe), nickel (Ni), copper (Cu), silver (Ag), and gold (Au), are pure elements; others, such as steel and brass, are composed of a combination of elemental metals.	
d. Students know that each element is made of one kind of atom and that the elements are organized in the periodic table by their chemical properties.	
e. Students know scientists have developed instruments that can create discrete images of atoms and molecules that show that the atoms and molecules often occur in well-ordered arrays.	
f. Students know differences in chemical and physical properties of substances are used to separate mixtures and identify compounds.	
g. Students know properties of solid, liquid, and gaseous substances, such as sugar (C ₆ H ₁₂ O ₆), water (H ₂ O), helium (He), oxygen (O ₂), nitrogen (N ₂), and carbon dioxide (CO ₂).	
h. Students know living organisms and most materials are composed of just a few elements.	
i. Students know the common properties of salts, such as sodium chloride (NaCl).	
Life Sciences	
2. Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials. As a basis for understanding this concept:	
a. Students know many multicellular organisms have specialized structures to support the transport of materials.	
b. Students know how blood circulates through the heart chambers, lungs, and body and how carbon dioxide (CO ₂) and oxygen (O ₂) are exchanged in the lungs and tissues.	Body Systems
c. Students know the sequential steps of digestion and the roles of teeth and the mouth, esophagus, stomach, small intestine, large intestine, and colon in the function of the digestive system.	Body Systems
d. Students know the role of the kidney in removing cellular waste from blood and converting it into urine, which is stored in the bladder.	Body Systems

e. Students know how sugar, water, and minerals are transported in a vascular plant.	Growing Plants
f. Students know plants use carbon dioxide (CO ₂) and energy from sunlight to build molecules of sugar and release oxygen.	
g. Students know plant and animal cells break down sugar to obtain energy, a process resulting in carbon dioxide (CO ₂) and water (respiration).	
Earth Sciences	
3. Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:	
a. Students know most of Earth's water is present as salt water in the oceans, which cover most of Earth's surface.	Water Cycle
b. Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.	Changing State
c. Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.	Predicting the Weather Water Cycle
d. Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.	Water Cycle Pollution
e. Students know the origin of the water used by their local communities.	
4. Energy from the Sun heats Earth unevenly, causing air movements that result in changing weather patterns. As a basis for understanding this concept:	
a. Students know uneven heating of Earth causes air movements (convection currents).	Predicting the Weather
b. Students know the influence that the ocean has on the weather and the role that the water cycle plays in weather patterns.	Predicting the Weather Water Cycle
c. Students know the causes and effects of different types of severe weather.	
d. Students know how to use weather maps and data to predict local weather and know that weather forecasts depend on many variables.	Predicting the Weather
e. Students know that the Earth's atmosphere exerts a pressure that decreases with distance above Earth's surface and that at any point it exerts this pressure equally in all directions.	Predicting the Weather
5. The solar system consists of planets and other bodies that orbit the Sun in predictable paths. As a basis for understanding this concept:	
a. Students know the Sun, an average star, is the central and largest body in the solar system and is composed primarily of hydrogen and helium.	Our Solar System
b. Students know the solar system includes the planet Earth, the Moon, the Sun, eight other planets and their satellites, and smaller objects, such as asteroids and comets.	Our Solar System
c. Students know the path of a planet around the Sun is due to the gravitational attraction between the Sun and the planet.	Our Solar System

Investigation and Experimentation	
6. 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. Classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria.	Rocks Habitats
b. Develop a testable question.	Forces Soil Growing Plants
c. Plan and conduct a simple investigation based on a student-developed question and write instructions others can follow to carry out the procedure.	Forces Plant Reproduction Soil Growing Plants
d. Identify the dependent and controlled variables in an investigation.	Forces
e. Identify a single independent variable in a scientific investigation and explain how this variable can be used to collect information to answer a question about the results of the experiment.	Forces
f. Select appropriate tools (e.g., thermometers, meter sticks, balances, and graduated cylinders) and make quantitative observations.	Changing State Separating Mixtures Gravity
g. Record data by using appropriate graphic representations (including charts, graphs, and labeled diagrams) and make inferences based on those data.	Friction Forces Water Cycle Energy Forms
h. Draw conclusions from scientific evidence and indicate whether further information is needed to support a specific conclusion.	Insulators and Conductors Separating Mixtures Friction Plant Reproduction Days and Seasons

<p>i. Write a report of an investigation that includes conducting tests, collecting data or examining evidence, and drawing conclusions.</p>	<p>Insulators and Conductors Separating Mixtures Friction Plant Reproduction Gravity Forces Sounds Days and Seasons</p>
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