

## Topics Addressed by the California Science Content Standards for K-5

### Kindergarten:

- Landforms
- Weather and Seasons
- Resource Use and Conservation
- Animal and Plant Parts
- Describing Properties of Materials
- Water's Different States

### Grade 2:

- Rocks, Sand, and Soil
- Fossils Provide Evidence of Life
- Resources Meet Our Needs
- Plant Life cycles and reproduction
- Animal Life cycles and reproduction
- Inherited Characteristics and Variation
- Force and Motion
- Simple Tools and Machines
- Sound

### Grade 4:

- The Rock Cycle
- Properties of Rocks and Minerals
- Shaping the Earth's Surface
- Food Chains and Webs
- Ecosystems
- Electric Circuits
- Magnets, Compasses, and Electromagnets
- Doing Work with Electrical Energy

### Grade 1:

- Measuring Weather Observations
- Sun Warming the Earth
- Plant and Animal Habitats
- How Plants/Animals Meet Needs
- Properties of Solids, Liquids, Gases
- Changing Properties with Mixing, Cooling, and Heating

### Grade 3:

- Star Patterns in the sky
- Phases of the Moon
- Earth and Moon Orbits
- Adaptations: Change Over Time
- Biodiversity and Extinction
- Energy: Sun, Forms, Storage, Conversion, and Carrying
- Energy and States of Matter
- Mixtures and Solutions
- All Matter is Atoms
- Light and Vision

### Grade 5:

- Water Distribution and Sources
- Water Cycle
- Causes of Weather
- Solar System and Gravity
- Plant Internal Processes
- Animal Internal Processes
- Atoms, Elements and Periodic Table
- Using Properties to Separate Mixtures and Identify Compounds
- Properties of Common Molecules

# California Science Content Standards for K-5

## EARTH SCIENCE

## LIFE SCIENCE

## PHYSICAL SCIENCE

### KINDERGARTEN

*The Earth is composed of land, air and water.*  
 1) Earth has different landforms, **characteristics of landforms** (mountains, oceans, valleys, rivers, deserts, local landforms - ocean, Mt Tam)  
 2) **Weather changes** daily and seasonally affecting us all  
 3) Many of **Earth's resources are used everyday and some resources can be conserved**

*Different plants and animals inhabit Earth*  
 1) You can **observe and describe appearance and behavior** of different plants and animals (similarities, differences of major groups)  
 2) **Stories about plants and animals are sometimes different from reality**  
 3) You can identify **major external structures of common plants & animals** (stems, leaves, roots, arms, legs, wings)

*Properties of materials can be observed, measured, predicted.*  
 1) You can describe objects' **materials** (paper, cloth, clay) and **physical properties** (shape, size, weight, buoyancy, flexibility, color, magnetism, texture)  
 2) **Water can change from liquid to solid and back again.**  
 3) **Water evaporates**, escaping from an open container, but remaining inside a closed container.

### FIRST GRADE

*Weather can be observed, measured, described.*  
 1) You can **use simple tools to measure weather & record changes** (thermometer, wind vane)  
 2) **Weather changes day to day, but trends are predictable** during a season  
 3) **Sun warms** land, air and water

*Plants and animals meet needs in different ways.*  
 1) **Different external features of living things (LT) help them thrive** in different environments  
 2) **Needs of living things** (water for plant & animal, food for animals, light for plants)  
 3) **How animals meet needs** (using other LT for food, shelter)  
 4) **Food and teeth shape:** You can tell what many animals eat from the shape of their teeth (sharp eats meat, flat eats plants)  
 5) **How plants meet needs** (roots, leaves, leaf shape)

*States of Materials*  
 1) **Solids, liquids, gases** have different properties  
 2) Substances' **properties change with mixing, cooling, heating**

### SECOND GRADE

*Earth is made of materials with distinct properties that provide resources for human activities.*  
 1) **Rocks** have different **physical properties** and are made of different combinations of **minerals**  
 2) **Breakage and weathering** create smaller rocks  
 3) **Soils**, created from rock & organic materials, differ in color, texture, water retention, ability to support growth  
 4) **Fossils** provide evidence about ancient life, scientists study fossils to learn about history  
 5) We get **resources from rock, water, plant, soil**, to meet our needs for food, fuel, shelter

*Plants and animals have predictable life cycles.*  
 1) **LT reproduce their own kind**, offspring resembles parents  
 2) Different animals have different **life cycles**  
 3) **LT inherit characteristics and respond to environment**  
 4) **Individuals of one kind can vary** within any population  
 5) **Plants are affected by environment** (germination, growth, affected by light, gravity, stress)  
 6) **Flowers and fruits** are associated with **plant reproduction**

*Motion of objects can be observed and measured.*  
 1) **Positions can be described** (relative to objects or background)  
 2) **Motion can be described** (observe position change over time)  
 3) **Motion can be changed with force** (push, pull, size of change is related to strength or amount of force)  
 4) **Simple tools and machines can apply force** (shovels, pulleys)  
 5) **Objects fall** to Earth unless held up  
 6) **Magnets** can apply force to move some objects  
 7) **Sound** is vibration, describe with pitch and volume

### THIRD GRADE

*Objects in the sky move in regular, predictable patterns.*  
 1) **Patterns of stars** stay the same although they appear to move across sky nightly and different stars are visible seasonally.  
 2) **Moon's appearance changes** in a predictable four-wk cycle  
 3) **Telescopes** magnify distant objects in sky, there are many more stars than can be seen with eye alone  
 4) Earth **orbits** sun with other planets, Moon orbits Earth  
 5) **Position of sun in sky** changes during day and seasonally

*Adaptations in physical structure or behaviour can improve an organisms chance for survival.*  
 1) **Structures of LT help them grow, survive, and reproduce.**  
 2) There are **diverse life forms in different environments.**  
 3) **LT change the environment they live in**, some changes have bad effect on organism, some have good effects  
 4) **When environment changes, LT respond** (may be able to survive and reproduce or may die or move to new environment)  
 5) **LT can disappear from the Earth**, some modern species resemble historic species (dinosaurs and lizards, ferns, some trees)

*Energy and matter have multiple forms and can be changed.*  
 1) **Energy comes from Sun to Earth** in the form of **light**.  
 2) **Energy can be stored** in many forms (food, fuel, batteries)  
 3) **Energy can be converted to motion and heat** by living things and machines  
 4) **Energy can be carried** in waves (water waves, sound) electric current, and moving objects  
 5) **Matter has three states (solid, liquid, gas) that change when energy is added** (heating to evaporate or melt) **or removed** (cooling to freeze solid)  
 6) **Combining substances can create new substances with different properties**  
 7) **All matter is made of atoms**, particles too small to be seen with the naked eye, not earth, wind, fire, and water as once thought  
 8) Experiments have revealed **many kinds of atoms or elements**

*Light has a source and travels in a direction.*  
 1) Sunlight can be blocked to create **shadows**  
 2) **Light is reflected** from mirrors and other surfaces  
 3) The **color of light** striking an object affects how our eyes see it  
 4) **Vision:** We see objects when light traveling from an object enters our eye

	<b>EARTH SCIENCE</b>	<b>LIFE SCIENCE</b>	<b>PHYSICAL SCIENCE</b>
<b>FOURTH GRADE</b>	<p><i>Properties of rocks and minerals reflect the processes that formed them.</i></p> <p>1) You can <b>tell igneous, sedimentary, metamorphic rocks apart</b> by their different properties and different methods of formation, <b>the rock cycle</b></p> <p>2) You can use a diagnostic property table to <b>identify common rock-forming minerals</b> (quartz, calcite, feldspar, mica, hornblende) <b>and ore minerals</b>.</p>	<p><i>All organisms need energy and matter to live and grow.</i></p> <p>1) <b>Plants are the primary source</b> of matter and energy entering most <b>food chains</b></p> <p>2) <b>Producers and consumers make up food chains and food webs, competing</b> for resources in ecosystem (herbivores, carnivores, omnivores, and decomposers)</p> <p>3) <b>Decomposers recycle matter</b> from dead plants and animals (includes many microorganisms, fungi, insects)</p>	<p><i>Electricity and magnetism are related effects that have useful applications in everyday life.</i></p> <p>1) You can <b>build series and parallel circuits</b> with wires, batteries and bulbs</p> <p>2) You can <b>build a simple compass</b> to detect Earth's magnetic field</p> <p>3) Electric currents produce magnetic fields, <b>build simple electromagnet</b></p> <p>4) <b>Electromagnets are used</b> to construct electric motors, generators, and simple devices (doorbells)</p> <p>5) <b>Behaviour of electrically charged objects</b> (repel, attract)</p> <p>6) <b>Magnets have two poles that react to each other</b> (north, south, like poles repel, unlike poles attract)</p> <p>7) <b>Electrical energy can be converted to heat, light, motion</b> (electrical cars and trains, power to homes)</p>
	<p><i>Waves, wind, water, and ice shape and reshape the Earth's land surface.</i></p> <p>1) There are <b>slow and rapid processes that change the Earth</b> (erosion, landslide, volcanoes, earthquakes)</p> <p>2) <b>Natural processes break down rocks into smaller pieces</b> (freezing/thawing, root growth)</p> <p>3) <b>Moving water erodes landforms</b>, rearranging rocks, pebbles, sand, and silt (<b>weathering, transport, deposition</b>)</p>	<p><i>Living organisms depend on one another and their environment for survival.</i></p> <p>1) <b>Ecosystems</b> include both living and non-living components (organisms, soils, climate, etc)</p> <p>2) <b>In each environment some organisms thrive, some do less well, and some cannot survive at all.</b></p> <p>3) <b>Relationships between plants and animals</b> (pollination, seed dispersal, animals rely on plants for food and shelter)</p> <p>4) <b>Role of microorganisms</b> (beneficial, most are not "germs")</p>	
<b>FIFTH GRADE</b>	<p><i>Water on Earth moves between the oceans and land through the processes of evaporation and condensation.</i></p> <p>1) <b>Most of Earth's water is salt water</b> in oceans which cover most of the Earth's surface</p> <p>2) When liquid water evaporates it turns into <b>water vapor</b> and can reappear as liquid when cooled, or solid if cooled below <b>freezing point</b></p> <p>3) <b>Water vapor moves in air, can form clouds or fog</b> (tiny droplets of water or ice) and <b>can fall</b> to Earth as rain, hail, sleet, or snow</p> <p>4) <b>Fresh water is limited</b> (located in rivers, lakes, underground sources and glaciers), and can be made more available to meet needs through <b>recycling and avoiding waste</b>.</p> <p>5) Your water comes from particular surface and/or groundwater supplies (<b>local community water sources</b>)</p> <p><i>(Earth Science continued next page)</i></p>	<p><i>Plants and animals have structures for respiration, digestion, waste disposal, and transport of materials.</i></p> <p>1) <b>Multicellular organisms have specialized structures</b></p> <p>2) <b>Blood circulatory system</b> (heart, lungs), lungs and tissues <b>exchange oxygen and carbon dioxide</b></p> <p>3) Steps and organs of <b>digestive system</b></p> <p>4) Role of kidneys, bladder in <b>cellular waste removal</b></p> <p>5) <b>Plant processes</b> and structures moving sugar, water, minerals</p> <p>6) Plants use carbon dioxide and energy to make molecules of sugar and release oxygen</p> <p>7) Plant and animal <b>cells break down sugar to obtain energy</b>, releasing carbon dioxide and water</p>	<p><i>Elements and their combinations account for all the varied types of matter.</i></p> <p>1) During chemical reactions <b>atoms rearrange</b> into different products with different properties</p> <p>2) All <b>matter is made of atoms</b>, which combine to form molecules</p> <p>3) Common <b>properties of metals</b> (conductivity, pure vs combinations of elemental metals)</p> <p>4) Each <b>element</b> is one kind of atom, organized in Periodic Table</p> <p>5) With <b>instruments</b> you can see that atoms and molecules are discrete and in well ordered arrays.</p> <p>6) <b>Separate mixtures</b> and <b>identify compounds</b> using their chemical and physical properties</p> <p>7) <b>Properties of common molecules</b> (sugar, water, oxygen, etc.)</p> <p>8) Just a <b>few elements</b> make all living things and most materials</p> <p>9) Common <b>properties of salts</b> (sodium chloride)</p>

**EARTH SCIENCE**

**LIFE SCIENCE**

**PHYSICAL SCIENCE**

**FIFTH GRADE**  
continued

*Energy from the sun heats the Earth unevenly, causing air movements resulting in changing weather patterns.*

- 1) **Wind, convection currents**, are air movements caused by uneven heating of the Earth
- 2) **The oceans influence the weather and the water cycle plays a role in weather patterns**
- 3) There are several **causes and effects of severe weather** (hurricanes, typhoons, tornadoes)
- 4) You can **use weather maps & data to predict weather, forecasts depend on** many variables
- 5) Earth's **atmosphere exerts a pressure**, decreasing with altitude, that is equal in all directions at any point.

*The solar system consists of planets and other bodies that orbit the sun in predictable paths.*

- 1) The **sun, an average star**, central and largest body in solar system, made of hydrogen and helium
- 2) **Solar system contains:** Earth, moon, sun, eight other planets & their satellites, smaller objects (comets, asteroids)
- 3) Path of a planet (orbit) is due to **gravitational attraction between** Sun and planet.



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