

**Correlation of *Seeds of Science/Roots of Reading* 2nd/3rd grade units to the
Content Standards for California Public Schools — Science
(Grade 1, Grade 2, Grade 3, Grade 4)**

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
1st Grade—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.			• •	
b. Students know the properties of substances can change when the substances are mixed, cooled, or heated.			• •	
1st Grade—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.	• • •	• • •		
b. Students know both plants and animals need water, animals need food, and plants need light.	• • •	• •		
c. Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.	• • •	• •		
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).		•		
e. Students know roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.	• • •			

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
1st Grade —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.				
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.				
c. Students know the sun warms the land, air, and water.				
1st Grade —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.	• • •	• • •		• •
b. Record observations and data with pictures, numbers, or written statements.	• • •	• • •	• • •	• • •
c. Record observations on a bar graph.				• •
d. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.	• • •	• • •	• • •	• • •

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
2nd Grade — 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.				• • •
d. Students know tools and machines are used to apply pushes and pulls (forces) to make things move.				•
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.				• • •
g. Students know sound is made by vibrating objects and can be described by its pitch and volume.				
2nd Grade — 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.				
b. Students know the sequential stages of life cycles are different for different animals, such as butterflies, frogs, and mice.	•			

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
2nd Grade —Life Sciences (continued)				
2. Plants and animals have predictable life cycles. As a basis for understanding this concept:				
c. Students know many characteristics of an organism are inherited from the parents. Some characteristics are caused or influenced by the environment.				
d. Students know there is variation among individuals of one kind within a population.				
e. Students know light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.	•	•		
f. Students know flowers and fruits are associated with reproduction in plants.				
2nd Grade —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.		•		
b. Students know smaller rocks come from the breakage and weathering of larger rocks.		•••		
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.	•••			
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.				

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
2nd Grade —Earth Sciences (continued)				
3. Earth is made of materials that have distinct properties and provide resources for human activities. As a basis for understanding this concept:				
e. Students know rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.	• • •	• •		
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2nd Grade — 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.	• • •	• •	• •	• • •
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).	•	• • •	• • •	• • •
d. Write or draw descriptions of a sequence of steps, events, and observations.	• • •	• • •	• • •	• •
e. Construct bar graphs to record data, using appropriately labeled axes.				• •
f. Use magnifiers or microscopes to observe and draw descriptions of small objects or small features of objects.	• •	• • •	• •	
g. Follow oral instructions for a scientific investigation.	• • •	• • •	• • •	• • •

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
3rd Grade— 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.				
b. Students know sources of stored energy take many forms, such as food, fuel, and batteries.	•			
c. Students know machines and living things convert stored energy to motion and heat.				
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.				
e. Students know matter has three forms: solid, liquid, and gas.			•	
f. Students know evaporation and melting are changes that occur when the objects are heated.			••	
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.			•••	
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.				

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
a. Students know sunlight can be blocked to create shadows.				
b. Students know light is reflected from mirrors and other surfaces.				
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.				
a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.	• • •	• • •		
b. Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.	•	•		
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.	• • •	• • •		
d. Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.	• • •	• • •		
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.				

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
3rd Grade —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.				
b. Students know the way in which the Moon's appearance changes during the four-week lunar cycle.				
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.				
d. Students know that Earth is one of several planets that orbit the Sun and that the Moon orbits Earth.				
e. Students know the position of the Sun in the sky changes during the course of the day and from season to season.				
3rd Grade —Investigation and Experimentation				
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:				
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.	• •	•	• • •	• •

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
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.	• • •	• • •	• • •	• • •
3rd Grade —Investigation and Experimentation				
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:				
c. Use numerical data in describing and comparing objects, events, and measurements.	• •	•	• • •	• • •
d. Predict the outcome of a simple investigation and compare the result with the prediction.	• • •	• •	• • •	• •
e. Collect data in an investigation and analyze those data to develop a logical conclusion.	• • •	• •	• • •	• • •

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
4th Grade—Physical Sciences				
1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:				
a. Students know how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.				
b. Students know how to build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.				• • •
c. Students know electric currents produce magnetic fields and know how to build a simple electromagnet.				
d. Students know the role of electromagnets in the construction of electric motors, electric generators, and simple devices, such as doorbells and earphones.				
e. Students know electrically charged objects attract or repel each other.				• • •
f. Students know that magnets have two poles (north and south) and that like poles repel each other while unlike poles attract each other.				• • •
g. Students know electrical energy can be converted to heat, light, and motion.				
4th Grade—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.	• •			

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
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.	•	•		
4th Grade—Life Sciences (continued)				
c. Students know decomposers, including many fungi, insects, and microorganisms, recycle matter from dead plants and animals.	••			
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.	•••	•••		
c. Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.	••	••		
d. Students know that most microorganisms do not cause disease and that many are beneficial.	•			
4th Grade—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).				

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
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.		• •		
b. Students know natural processes, including freezing and thawing and the growth of roots, cause rocks to break down into smaller pieces.		• • •		
4th Grade —Earth Sciences (continued)				
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).		• • •		
4th Grade—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.	• • •	• • •	• • •	
b. Measure and estimate the weight, length, or volume of objects.	•	•	• •	• •

	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism
c. Formulate and justify predictions based on cause-and-effect relationships.	• •		• • •	• •
d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.	• • •	•	• •	• •
e. Construct and interpret graphs from measurements.	• •			• • •
f. Follow a set of written instructions for a scientific investigation.	• • •	• • •	• • •	• • •