

Correlation of
Seeds of Science/Roots of Reading[®]
units to
Massachusetts Science Standards for Grade 2-5



Seeds of Science/Roots of Reading was created with support from the National Science Foundation. The program was created by a team at the Lawrence Hall of Science of the University of California, Berkeley.
Created November 2009.

	Grades 2-3			
	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity and Magnetism

GRADES PreK–2 STANDARDS

SKILLS OF INQUIRY, EXPERIMENTATION, AND DESIGN

Ask questions about objects, organisms, and events in the environment.	...	...	...	...
Tell about <i>why and what would happen if?</i>	...	...	...	...
Make predictions based on observed patterns.	...	...	...	...
Name and use simple equipment and tools (e.g., rulers, meter sticks, thermometers, hand lenses, and balances) to gather data and extend the senses.	...	...	...	...
Record observations and data with pictures, numbers, or written statements.	...	...	...	...
Discuss observations with others.	...	...	...	...

EARTH AND SPACE SCIENCE

Earth's Materials

1. Recognize that water, rocks, soil, and living organisms are found on the earth's surface.	...	...
2. Understand that air is a mixture of gases that is all around us and that wind is moving air.				

The Weather

3. Describe the weather changes from day to day and over the seasons.				
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The Sun as a Source of Light and Heat

4. Recognize that the sun supplies heat and light to the earth and is necessary for life.				
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Periodic Phenomena

5. Identify some events around us that have repeating patterns, including the seasons of the year, day and night.				
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LIFE SCIENCE (BIOLOGY)

Characteristics of Living Things

1. Recognize that animals (including humans) and plants are living things that grow, reproduce, and need food, air, and water.		
2. Differentiate between living and nonliving things. Group both living and nonliving things according to the characteristics that they share.		

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3. Recognize that plants and animals have life cycles, and that life cycles vary for different living things.	..	.		
Heredity				
4. Describe ways in which many plants and animals closely resemble their parents in observed appearance.				
Evolution and Biodiversity				
5. Recognize that fossils provide us with information about living things that inhabited the earth years ago.				
Living Things and Their Environment				
6. Recognize that people and other animals interact with the environment through their senses of sight, hearing, touch, smell, and taste.	..	..
7. Recognize changes in appearance that animals and plants go through as the seasons change.	..			
8. Identify the ways in which an organism's habitat provides for its basic needs (plants require air, water, nutrients, and light; animals require food, water, air, and shelter).	...	...
PHYSICAL SCIENCES (CHEMISTRY AND PHYSICS)				
Observable Properties of Objects				
1. Sort objects by observable properties such as size, shape, color, weight, and texture.			...	
States of Matter				
2. Identify objects and materials as solid, liquid, or gas. Recognize that solids have a definite shape and that liquids and gases take the shape of their container.			.	
Position and Motion of Objects				
3. Describe the various ways that objects can move, such as in a straight line, zigzag, back-and-forth, round-and-round, fast, and slow.				
4. Demonstrate that the way to change the motion of an object is to apply a force (give it a push or a pull). The greater the force, the greater the change in the motion of the object.				...
5. Recognize that under some conditions, objects can be balanced.				..
TECHNOLOGY/ENGINEERING				
1. Materials and Tools				
<i>Central Concept:</i> Materials both natural and human-made have specific characteristics that determine how they will be used.				
1.1 Identify and describe characteristics of natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).			...	
1.2 Identify and explain some possible uses for natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).			...	

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1.3 Identify and describe the safe and proper use of tools and materials (e.g., glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structures.				
2. Engineering Design <i>Central Concept:</i> Engineering design requires creative thinking and consideration of a variety of ideas to solve practical problems.				
2.1 Identify tools and simple machines used for a specific purpose, e.g., ramp, wheel, pulley, lever.				
2.2 Describe how human beings use parts of the body as tools (e.g., teeth for cutting, hands for grasping and catching), and compare their use with the ways in which animals use those parts of their bodies.				

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	<i>Soil Habitats</i>	<i>Shoreline Science</i>	<i>Designing Mixtures</i>	<i>Gravity and Magnetism</i>	<i>Weather and Water</i>	<i>Light Energy</i>	<i>Variation & Adaptation</i>	<i>Digestion & Body Systems</i>	<i>Planets and Moons</i>	<i>Aquatic Ecosystems</i>	<i>Models of Matter</i>	<i>Chemical Changes</i>
GRADES 3-5 STANDARDS												
SKILLS OF INQUIRY, EXPERIMENTATION, AND DESIGN												
Ask questions and make predictions that can be tested.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
Select and use appropriate tools and technology (e.g., calculators, computers, balances, scales, meter sticks, graduated cylinders) in order to extend observations.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
Keep accurate records while conducting simple investigations or experiments.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
Conduct multiple trials to test a prediction. Compare the result of an investigation or experiment with the prediction.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
Recognize simple patterns in data and use data to create a reasonable explanation for the results of an investigation or experiment.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
Record data and communicate findings to others using graphs, charts, maps, models, and oral and written reports.	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••	•••
EARTH AND SPACE SCIENCE												
Rocks and Their Properties												
1. Give a simple explanation of what a mineral is and some examples, e.g., quartz, mica.		••										

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2. Identify the physical properties of minerals (hardness, color, luster, cleavage, and streak), and explain how minerals can be tested for these different physical properties.		••										
3. Identify the three categories of rocks (metamorphic, igneous, and sedimentary) based on how they are formed, and explain the natural and physical processes that create these rocks.		•										
Soil												
4. Explain and give examples of the ways in which soil is formed (the weathering of rock by water and wind and from the decomposition of plant and animal remains).	•••	••										
5. Recognize and discuss the different properties of soil, including color, texture (size of particles), the ability to retain water, and the ability to support the growth of plants.	•••											
Weather												
6. Explain how air temperature, moisture, wind speed and direction, and precipitation make up the weather in a particular place and time.					•••							
7. Distinguish among the various forms of precipitation (rain, snow, sleet, and hail), making connections to the weather in a particular place and time.					•••							

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8. Describe how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.												
9. Differentiate between weather and climate.					••							
The Water Cycle												
10. Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.					•••							
11. Give examples of how the cycling of water, both in and out of the atmosphere, has an effect on climate.					••							
Earth's History												
12. Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.	••	•••										
The Earth in the Solar System												
13. Recognize that the earth is part of a system called the “solar system” that includes the sun (a star), planets, and many moons. The earth is the third planet from the sun in our solar system.									•••			
14. Recognize that the earth revolves around (orbits) the sun in a year’s time and that the earth rotates on its axis once approximately every 24 hours. Make connections between the rotation of the earth and day/night,									•••			

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and the apparent movement of the sun, moon, and stars across the sky.												
15. Describe the changes that occur in the observable shape of the moon over the course of a month.									•••			
LIFE SCIENCE (BIOLOGY)												
Characteristics of Plants and Animals												
1. Classify plants and animals according to the physical characteristics that they share.	••	••					•••					
Structures and Functions												
2. Identify the structures in plants (leaves, roots, flowers, stem, bark, wood) that are responsible for food production, support, water transport, reproduction, growth, and protection.							••					
3. Recognize that plants and animals go through predictable life cycles that include birth, growth, development, reproduction, and death.	••	•								•		
4. Describe the major stages that characterize the life cycle of the frog and butterfly as they go through metamorphosis.												
5. Differentiate between observed characteristics of plants and animals that are fully inherited (e.g., color of flower, shape of leaves, color of eyes, number of appendages) and characteristics that are affected by the climate or environment (e.g., browning of leaves due to too much sun, language spoken).							•••					

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Adaptations of Living Things												
6. Give examples of how inherited characteristics may change over time as adaptations to changes in the environment that enable organisms to survive, e.g., shape of beak or feet, placement of eyes on head, length of neck, shape of teeth, color.							•••					
7. Give examples of how changes in the environment (drought, cold) have caused some plants and animals to die or move to new locations (migration).							••					
8. Describe how organisms meet some of their needs in an environment by using behaviors (patterns of activities) in response to information (stimuli) received from the environment. Recognize that some animal behaviors are instinctive (e.g., turtles burying their eggs), and others are learned (e.g., humans building fires for warmth, chimpanzees learning how to use tools).	••	••					••			••		
9. Recognize plant behaviors, such as the way seedlings' stems grow toward light and their roots grow downward in response to gravity. Recognize that many plants and animals can survive harsh environments because of seasonal behaviors, e.g., in winter, some trees shed leaves, some animals hibernate, and other animals migrate.	••											

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10. Give examples of how organisms can cause changes in their environment to ensure survival. Explain how some of these changes may affect the ecosystem.	••											
Energy and Living Things												
11. Describe how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within a food chain from producers (plants) to consumers to decomposers.						••				•••		
PHYSICAL SCIENCES (CHEMISTRY AND PHYSICS)												
Properties of Objects and Materials												
1. Differentiate between properties of objects (e.g., size, shape, weight) and properties of materials (e.g., color, texture, hardness).			••								•	
States of Matter												
2. Compare and contrast solids, liquids, and gases based on the basic properties of each of these states of matter.						•••					•••	
3. Describe how water can be changed from one state to another by adding or taking away heat.						•••					•••	
Forms of Energy												
4. Identify the basic forms of energy (light, sound, heat, electrical, and magnetic). Recognize that energy is the ability to cause motion or create change.						•••						

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5. Give examples of how energy can be transferred from one form to another.						•••						
Electrical Energy												
6. Recognize that electricity in circuits requires a complete loop through which an electrical current can pass, and that electricity can produce light, heat, and sound.						•						
7. Identify and classify objects and materials that conduct electricity and objects and materials that are insulators of electricity.												
8. Explain how electromagnets can be made, and give examples of how they can be used.												
Magnetic Energy												
9. Recognize that magnets have poles that repel and attract each other.				•••								
10. Identify and classify objects and materials that a magnet will attract and objects and materials that a magnet will not attract.				•••								
Sound Energy												
11. Recognize that sound is produced by vibrating objects and requires a medium through which to travel. Relate the rate of vibration to the pitch of the sound.						•						
Light Energy												

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12. Recognize that light travels in a straight line until it strikes an object or travels from one medium to another, and that light can be reflected, refracted, and absorbed.						•••						
TECHNOLOGY/ENGINEERING												
1. Materials and Tools												
<i>Central Concept:</i> Materials both natural and human-made have specific characteristics that determine how they will be used.												
1.1 Identify and describe characteristics of natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).			••			••			••			
1.2 Identify and explain some possible uses for natural materials (e.g., wood, cotton, fur, wool) and human-made materials (e.g., plastic, Styrofoam).			•••			••			••			
1.3 Identify and describe the safe and proper use of tools and materials (e.g., glue, scissors, tape, ruler, paper, toothpicks, straws, spools) to construct simple structures.												
2. Engineering Design												
<i>Central Concept:</i> Engineering design requires creative thinking and consideration of a variety of ideas to solve practical problems.												
2.1 Identify tools and simple machines used for a specific purpose, e.g., ramp, wheel, pulley, lever.									•			

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2.2 Describe how human beings use parts of the body as tools (e.g., teeth for cutting, hands for grasping and catching), and compare their use with the ways in which animals use those parts of their bodies.												

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