

Correlation of
Seeds of Science/Roots of Reading[®]
Integrated Science and Literacy Units

with the State of Utah
Science Standards
for Grade 6

Created February 2010



Seeds of Science/Roots of Reading[®] was created with partial support from the National Science Foundation under grant numbers ESI-0242733 and ESI-0628272. The program was created by a team at the Lawrence Hall of Science at the University of California, Berkeley.

Utah Science Standards – 6 th Grade	2 nd - 3 rd Grade				3 rd - 4 th Grade				4 th - 5 th Grade			
	Soil Habitats	Shoreline Science	Designing Mixtures	Gravity & Magnetism	Light Energy	Weather & Water	Variation and Adaptation	Digestion & Body Systems	Planets & Moons	Aquatic Ecosystems	Models of Matter	Chemical Changes
STANDARD I: Students will understand that the appearance of the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.												
Objective 1: Explain patterns of changes in the appearance of the moon as it orbits Earth.												
a. Describe changes in the appearance of the moon during a month.									● ● ●			
b. Identify the pattern of change in the moon's appearance.									● ● ●			
c. Use observable evidence to explain the movement of the moon around Earth in relationship to Earth turning on its axis and the position of the moon changing in the sky.									● ● ●			
d. Design an investigation, construct a chart, and collect data depicting the phases of the moon.									● ●			
Objective 2: Demonstrate how the relative positions of Earth, the moon, and the sun create the appearance of the moon's phases.												
a. Identify the difference between the motion of an object rotating on its axis and an object revolving in orbit.									● ● ●			
b. Compare how objects in the sky (the moon, planets, stars) change in relative position over the course of the day or night.									● ● ●			

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c. Model the movement and relative positions of Earth, the moon, and the sun.									● ● ●			
STANDARD II: Students will understand how Earth's tilt on its axis changes the length of daylight and creates the seasons.												
Objective 1: Describe the relationship between the tilt of Earth's axis and its yearly orbit around the sun.												
a. Describe the yearly revolution (orbit) of Earth around the sun.									● ● ●			
b. Explain that Earth's axis is tilted relative to its yearly orbit around the sun.									●			
c. Investigate the relationship between the amount of heat absorbed and the angle to the light source.												
Objective 2: Explain how the relationship between the tilt of Earth's axis and its yearly orbit around the sun produces the seasons.												
a. Compare Earth's position in relationship to the sun during each season.												
b. Compare the hours of daylight and illustrate the angle that the sun's rays strikes the surface of Earth during summer, fall, winter, and spring in the Northern Hemisphere.												
c. Use collected data to compare patterns relating to seasonal daylight changes.												

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d. Use a drawing and/or model to explain that changes in the angle at which light from the sun strikes Earth, and the length of daylight, determine seasonal differences in the amount of energy received.												
e. Use a model to explain why the seasons are reversed in the Northern and Southern Hemispheres.												
STANDARD III: Students will understand the relationship and attributes of objects in the solar system.												
Objective 1: Describe and compare the components of the solar system.												
a. Identify the planets in the solar system by name and relative location from the sun.									● ● ●			
b. Using references, compare the physical properties of the planets (e.g., size, solid or gaseous).									● ● ●			
c. Use models and graphs that accurately depict scale to compare the size and distance between objects in the solar system.									● ● ●			
d. Describe the characteristics of comets, asteroids, and meteors.									● ● ●			
e. Research and report on the use of manmade satellites orbiting Earth and various planets.									● ● ●			

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Objective 2: Describe the use of technology to observe objects in the solar system and relate this to science’s understanding of the solar system.												
a. Describe the use of instruments to observe and explore the moon and planets.									● ● ●			
b. Describe the role of computers in understanding the solar system (e.g., collecting and interpreting data from observations, predicting motion of objects, operating space probes).									● ● ●			
c. Relate science’s understanding of the solar system to the technology used to investigate it.									● ● ●			
d. Find and report on ways technology has been and is being used to investigate the solar system.									● ● ●			
Objective 3: Describe the forces that keep objects in orbit in the solar system.												
a. Describe the forces holding Earth in orbit around the sun, and the moon in orbit around Earth.									● ● ●			
b. Relate a celestial object’s mass to its gravitational force on other objects.									●			
c. Identify the role gravity plays in the structure of the solar system.									● ● ●			
STANDARD IV: Students will understand the scale of size, distance between objects, movement, and apparent motion (due to Earth’s rotation) of objects in the universe and how cultures have understood, related to and used these objects in the night sky.												
Objective 1: Compare the size and distance of objects within systems in the universe.												

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a. Use the speed of light as a measuring standard to describe the relative distances to objects in the universe (e.g., 4.4 light years to star Alpha Centauri; 0.00002 light years to the sun).					●				● ● ●			
b. Compare distances between objects in the solar system.									● ● ●			
c. Compare the size of the Solar System to the size of the Milky Way galaxy.												
d. Compare the size of the Milky Way galaxy to the size of the known universe.												
Objective 2: Describe the appearance and apparent motion of groups of stars in the night sky relative to Earth and how various cultures have understood and used them.												
a. Locate and identify stars that are grouped in patterns in the night sky.												
b. Identify ways people have historically grouped stars in the night sky.												
c. Recognize that stars in a constellation are not all the same distance from Earth.												
d. Relate the seasonal change in the appearance of the night sky to Earth's position.												

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e. Describe ways that familiar groups of stars may be used for navigation and calendars.									● ●			
STANDARD V: Students will understand that microorganisms range from simple to complex, are found almost everywhere, and are both helpful and harmful.												
Objective 1: Observe and summarize information about microorganisms.												
a. Examine and illustrate size, shape, and structure of organisms found in an environment such as pond water.							● ● ●			● ● ●		
b. Compare characteristics common in observed organisms (e.g., color, movement, appendages, shape) and infer their function (e.g., green color found in organisms that are producers, appendages help movement).							● ● ●			● ● ●		
c. Research and report on a microorganism’s requirements (i.e., food, water, air, waste disposal, temperature of environment, reproduction).										● ●		
Objective 2: Demonstrate the skills needed to plan and conduct an experiment to determine a microorganism’s requirements in a specific environment.												
a. Formulate a question about microorganisms that can be answered with a student experiment.										● ●		

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b. Develop a hypothesis for a question about microorganisms based on observations and prior knowledge.										● ●		
c. Plan and carry out an investigation on microorganisms. {Note: Teacher must examine plans and procedures to assure the safety of students; for additional information, you may wish to read microbe safety information on Utah Science Home Page.}										● ●		
d. Display results in an appropriate format (e.g., graphs, tables, diagrams).										● ●		
e. Prepare a written summary or conclusion to describe the results in terms of the hypothesis for the investigation on microorganisms.										● ●		
Objective 3: Identify positive and negative effects of microorganisms and how science has developed positive uses for some microorganisms and overcome the negative effects of others.												
a. Describe in writing how microorganisms serve as decomposers in the environment.										●		

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b. Identify how microorganisms are used as food or in the production of food (e.g., yeast helps bread rise, fungi flavor cheese, algae are used in ice cream, bacteria are used to make cheese and yogurt).												
c. Identify helpful uses of microorganisms (e.g., clean up oil spills, purify water, digest food in digestive tract, antibiotics) and the role of science in the development of understanding that led to positive uses (i.e., Pasteur established the existence, growth, and control of bacteria; Fleming isolated and developed penicillin).												
d. Relate several diseases caused by microorganisms to the organism causing the disease (e.g., athlete's foot -fungi, streptococcus throat -bacteria, giardia - protozoa).												
e. Observe and report on microorganisms' harmful effects on food (e.g., causes fruits and vegetables to rot, destroys food bearing plants, makes milk sour).												
STANDARD VI: Students will understand properties and behavior of heat, light, and sound.												
Objective 1: Investigate the movement of heat between objects by conduction, convection, and radiation.												

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a. Compare materials that conduct heat to materials that insulate the transfer of heat energy.												
b. Describe the movement of heat from warmer objects to cooler objects by conduction and convection.												
c. Describe the movement of heat across space from the sun to Earth by radiation.												
d. Observe and describe, with the use of models, heat energy being transferred through a fluid medium (liquid and/or gas) by convection currents.												
e. Design and conduct an investigation on the movement of heat energy.												
Objective 2: Describe how light can be produced, reflected, refracted, and separated into visible light of various colors.												
a. Compare light from various sources (e.g., intensity, direction, color).					● ●							
b. Compare the reflection of light from various surfaces (e.g., loss of light, angle of reflection, reflected color).					● ●							

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c. Investigate and describe the refraction of light passing through various materials (e.g., prisms, water).					● ● ●							
d. Predict and test the behavior of light interacting with various fluids (e.g., light transmission through fluids, refraction of light).					●							
e. Predict and test the appearance of various materials when light of different colors is shone on the material.					●							
Objective 3: Describe the production of sound in terms of vibration of objects that create vibrations in other materials.												
a. Describe how sound is made from vibration and moves in all directions from the source in waves.												
b. Explain the relationship of the size and shape of a vibrating object to the pitch of the sound produced.												
c. Relate the volume of a sound to the amount of energy used to create the vibration of the object producing the sound.												
d. Make a musical instrument and report on how it produces sound.												

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