

National Science Education Standards
Correlations to
Seeds of Science/Roots of Reading™
Third-Fourth Grade Units:

Light Energy,
Weather and Water,
Variation and Adaptation,
and
Digestion and Body Systems

Correlation of *Seeds/Roots* 2nd/3rd grade units to the National Science Education Standards (K-4)

	Light Energy	Weather & Water	Variation & Adaptation	Digestion & Body Systems
<i>GRADES K-4 — SCIENCE AS INQUIRY</i>				
<i>UNDERSTANDINGS ABOUT SCIENTIFIC INQUIRY</i>				
Scientific investigations involve asking and answering a question and comparing the answer with what scientists already know about the world.	• • •	• • •	• • •	• • •
Scientists use different kinds of investigations depending on the questions they are trying to answer. Types of investigations include describing objects, events, and organisms; classifying them; and doing a fair test (experimenting).	• •	• •	•	• •
Simple instruments, such as magnifiers, thermometers, and rulers, provide more information than scientists obtain using only their senses.	• •	• • •	•	•
Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.	• • •	• • •	• • •	• • •
Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.	• • •	• • •	• • •	• • •
Scientists review and ask questions about the results of other scientists' work.	• •	• •	• •	• •

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	Light Energy	Weather & Water	Variation & Adaptation	Digestion & Body Systems
GRADES K-4 — PHYSICAL SCIENCE (continued)				
PROPERTIES OF OBJECTS AND MATERIALS (continued)				
Objects have many observable properties, including size, weight, shape, color, temperature, and the ability to react with other substances. Those properties can be measured using tools, such as rulers, balances, and thermometers.	• • •	••		•
Objects are made of one or more materials, such as paper, wood, and metal. Objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects or materials.	••			
Materials can exist in different states--solid, liquid, and gas. Some common materials, such as water, can be changed from one state to another by heating or cooling.		• • •		
POSITION AND MOTION OF OBJECTS				
The position of an object can be described by locating it relative to another object or the background.				
An object's motion can be described by tracing and measuring its position over time.				
The position and motion of objects can be changed by pushing or pulling. The size of the change is related to the strength of the push or pull.				
Sound is produced by vibrating objects. The pitch of the sound can be varied by changing the rate of vibration.				

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<i>GRADES K-4 — PHYSICAL SCIENCE (continued)</i>				
<i>LIGHT, HEAT, ELECTRICITY, AND MAGNETISM</i>				
Light travels in a straight line until it strikes an object. Light can be reflected by a mirror, refracted by a lens, or absorbed by the object.				
Heat can be produced in many ways, such as burning, rubbing, or mixing one substance with another. Heat can move from one object to another by conduction.				
Electricity in circuits can produce light, heat, sound, and magnetic effects.				
Electrical circuits require a complete loop through which an electrical current can pass.				
Magnets attract and repel each other and certain kinds of other materials.				• • •
<i>GRADES K-4 — LIFE SCIENCE</i>				
<i>THE CHARACTERISTICS OF ORGANISMS</i>				
Organisms have basic needs. For example, animals need air, water, and food; plants require air, water, nutrients, and light. Organisms can survive only in environments in which their needs can be met. The world has many different environments, and distinct environments support the life of different types of organisms.			• • •	

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	Light Energy	Weather & Water	Variation & Adaptation	Digestion & Body Systems
GRADES K-4 — LIFE SCIENCE (continued)				
THE CHARACTERISTICS OF ORGANISMS (continued)				
Each plant or animal has different structures that serve different functions in growth, survival, and reproduction. For example, humans have distinct body structures for walking, holding, seeing, and talking.			• • •	• • •
The behavior of individual organisms is influenced by internal cues (such as hunger) and by external cues (such as a change in the environment). Humans and other organisms have senses that help them detect internal and external cues.				•
LIFE CYCLES OF ORGANISMS				
Plants and animals have life cycles that include being born, developing into adults, reproducing, and eventually dying. The details of this life cycle are different for different organisms.				
Plants and animals closely resemble their parents.			• • •	
Many characteristics of an organism are inherited from the parents of the organism, but other characteristics result from an individual's interactions with the environment. Inherited characteristics include the color of flowers and the number of limbs of an animal. Other features, such as the ability to ride a bicycle, are learned through interactions with the environment and cannot be passed on to the next generation.			• • •	

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<i>ORGANISMS AND THEIR ENVIRONMENTS</i>				
All animals depend on plants. Some animals eat plants for food. Other animals eat animals that eat the plants.				
An organism's patterns of behavior are related to the nature of that organism's environment, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment. When the environment changes, some plants and animals survive and reproduce, and others die or move to new locations.			••	
All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.				
Humans depend on their natural and constructed environments. Humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.				
<i>GRADES K-4 — EARTH AND SPACE SCIENCE</i>				
<i>PROPERTIES OF EARTH MATERIALS</i>				
Earth materials are solid rocks and soils, water, and the gases of the atmosphere. The varied materials have different physical and chemical properties, which make them useful in different ways, for example, as building materials, as sources of fuel, or for growing the plants we use as food. Earth materials provide many of the resources that humans use.				

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<i>GRADES K-4 — EARTH AND SPACE SCIENCE (continued)</i>				
<i>PROPERTIES OF EARTH MATERIALS (continued)</i>				
Soils have properties of color and texture, capacity to retain water, and ability to support the growth of many kinds of plants, including those in our food supply.				
Fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.			• • •	
<i>OBJECTS IN THE SKY</i>				
The sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.				
The sun provides the light and heat necessary to maintain the temperature of the earth.				
<i>CHANGES IN THE EARTH AND SKY</i>				
The surface of the earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.				
Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.		• • •		

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GRADES K-4 — EARTH AND SPACE SCIENCE (continued)				
CHANGES IN THE EARTH AND SKY (continued)				
Objects in the sky have patterns of movement. The sun, for example, appears to move across the sky in the same way every day, but its path changes slowly over the seasons. The moon moves across the sky on a daily basis much like the sun. The observable shape of the moon changes from day to day in a cycle that lasts about a month.				
GRADES K-4 — SCIENCE AND TECHNOLOGY				
ABILITIES OF TECHNOLOGICAL DESIGN:				
Identify a simple problem. In problem identification, children should develop the ability to explain a problem in their own words and identify a specific task and solution related to the problem.				
Propose a solution. Students should make proposals to build something or get something to work better; they should be able to describe and communicate their ideas. Students should recognize that designing a solution might have constraints, such as cost, materials, time, space, or safety.		•		••
Implementing proposed solutions. Children should develop abilities to work individually and collaboratively and to use suitable tools, techniques, and quantitative measurements when appropriate. Students should demonstrate the ability to balance simple constraints in problem solving.		•		••

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GRADES K-4 — SCIENCE AND TECHNOLOGY (continued)				
ABILITIES OF TECHNOLOGICAL DESIGN: (continued)				
Evaluate a product or design. Students should evaluate their own results or solutions to problems, as well as those of other children, by considering how well a product or design met the challenge to solve a problem. When possible, students should use measurements and include constraints and other criteria in their evaluations. They should modify designs based on the results of evaluations.		•		••
Communicate a problem, design, and solution. Student abilities should include oral, written, and pictorial communication of the design process and product. The communication might be show and tell, group discussions, short written reports, or pictures, depending on the students' abilities and the design project.		•		••
UNDERSTANDING ABOUT SCIENCE AND TECHNOLOGY				
People have always had questions about their world. Science is one way of answering questions and explaining the natural world.	•••	•••	•••	•••
People have always had problems and invented tools and techniques (ways of doing something) to solve problems. Trying to determine the effects of solutions helps people avoid some new problems.	•			
Scientists and engineers often work in teams with different individuals doing different things that contribute to the results. This understanding focuses primarily on teams working together and secondarily, on the combination of scientist and engineer teams.	••	••	••	••

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<i>GRADES K-4 — SCIENCE AND TECHNOLOGY (continued)</i>				
<i>UNDERSTANDING ABOUT SCIENCE AND TECHNOLOGY (continued)</i>				
Women and men of all ages, backgrounds, and groups engage in a variety of scientific and technological work.	••	••	••	••
Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things that they could not otherwise see, measure, and do.	•	•••	•	•
<i>ABILITIES TO DISTINGUISH BETWEEN NATURAL OBJECTS AND OBJECTS MADE BY HUMANS</i>				
Some objects occur in nature; others have been designed and made by people to solve human problems and enhance the quality of life.				
Objects can be categorized into two groups, natural and designed.				

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<i>GRADES K-4 — SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES (continued)</i>				
<i>PERSONAL HEALTH</i>				
Safety and security are basic needs of humans. Safety involves freedom from danger, risk, or injury. Security involves feelings of confidence and lack of anxiety and fear. Student understandings include following safety rules for home and school, preventing abuse and neglect, avoiding injury, knowing whom to ask for help, and when and how to say no.				
Individuals have some responsibility for their own health. Students should engage in personal care--dental hygiene, cleanliness, and exercise--that will maintain and improve health. Understandings include how communicable diseases, such as colds, are transmitted and some of the body's defense mechanisms that prevent or overcome illness.				•
Nutrition is essential to health. Students should understand how the body uses food and how various foods contribute to health. Recommendations for good nutrition include eating a variety of foods, eating less sugar, and eating less fat.				•••
Different substances can damage the body and how it functions. Such substances include tobacco, alcohol, over-the-counter medicines, and illicit drugs. Students should understand that some substances, such as prescription drugs, can be beneficial, but that any substance can be harmful if used inappropriately.				

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GRADES K-4 — SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES (continued)				
CHARACTERISTICS AND CHANGES IN POPULATIONS				
Human populations include groups of individuals living in a particular location. One important characteristic of a human population is the population density--the number of individuals of a particular population that lives in a given amount of space.				
The size of a human population can increase or decrease. Populations will increase unless other factors such as disease or famine decrease the population.				
TYPES OF RESOURCES				
Resources are things that we get from the living and nonliving environment to meet the needs and wants of a population.	•			
Some resources are basic materials, such as air, water, and soil; some are produced from basic resources, such as food, fuel, and building materials; and some resources are nonmaterial, such as quiet places, beauty, security, and safety.	•			
The supply of many resources is limited. If used, resources can be extended through recycling and decreased use.	•			

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<i>GRADES K-4 — SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES (continued)</i>				
<i>CHANGES IN ENVIRONMENTS</i>				
Environments are the space, conditions, and factors that affect an individual's and a population's ability to survive and their quality of life.	•	•		
Changes in environments can be natural or influenced by humans. Some changes are good, some are bad, and some are neither good nor bad. Pollution is a change in the environment that can influence the health, survival, or activities of organisms, including humans.	••	••		
Some environmental changes occur slowly, and others occur rapidly. Students should understand the different consequences of changing environments in small increments over long periods as compared with changing environments in large increments over short periods.	•	•		
<i>SCIENCE AND TECHNOLOGY IN LOCAL CHALLENGES</i>				
People continue inventing new ways of doing things, solving problems, and getting work done. New ideas and inventions often affect other people; sometimes the effects are good and sometimes they are bad. It is helpful to try to determine in advance how ideas and inventions will affect other people.				
Science and technology have greatly improved food quality and quantity, transportation, health, sanitation, and communication. These benefits of science and technology are not available to all of the people in the world.				

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<i>GRADES K-4 — HISTORY AND NATURE OF SCIENCE</i>				
<i>SCIENCE AS A HUMAN ENDEAVOR</i>				
Science and technology have been practiced by people for a long time.				
Men and women have made a variety of contributions throughout the history of science and technology.	••	••	••	••
Although men and women using scientific inquiry have learned much about the objects, events, and phenomena in nature, much more remains to be understood. Science will never be finished.				
Many people choose science as a career and devote their entire lives to studying it. Many people derive great pleasure from doing science.	•••	•••	•••	•••

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