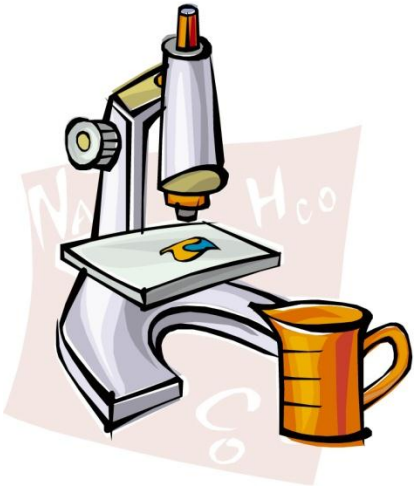
Boulder Valley School District
Excellence and Equity

4th Grade Science Curriculum Essentials Document



Boulder Valley School District
Department of Curriculum and Instruction
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Introduction

Science Curriculum Essentials in BVSD

In 2009, the Colorado Department of Education published the most recent version of the Colorado Academic Standards.

This revision of the Boulder Valley School District Science Curriculum had three main goals:

- align with the revised Colorado Academic Standards
- maintain unique elements of our BVSD curriculum that reach beyond the standards
- maintain a viable list of concepts and skills that students should master in each grade level or course

Inquiry

A new organizational feature of the Colorado Academic Standards is the integration of science inquiry skills with specific scientific concepts. Instead of having a separate standard for inquiry, the skills associated with the process of scientific inquiry are embedded in the Evidence Outcomes for each Grade Level Expectation. In addition, the nature and history of science has been integrated into the Grade Level Expectations under "Nature of the Discipline". This approach is echoed by the *Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas* which states that the skills or practices of inquiry and the core ideas "must be woven together in standards, curricula, instruction, and assessments."

Scientific inquiry remains a central focus of the revised BVSD Science Curriculum Essentials Documents. The following definition from the *National Science Education Standards* serves as the basis for our common understanding of how scientific inquiry is defined.

Scientific inquiry refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Inquiry also refers to the activities of students in which they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study the natural world.

The following points serve to clarify the vision of what inquiry means in BVSD.

Inquiry involves five essential features, which are heavily integrated into the wording of Evidence Outcomes in the Colorado Academic Standards. Students engaged in scientific inquiry should:

- ask or respond to scientifically oriented questions
- give priority to evidence
- formulate explanations based on evidence
- connect explanations to scientific knowledge
- communicate and justify explanations
  (*Inquiry and the National Science Education Standards*)

Inquiry based science instruction involves a continuum of learning experiences from teacher-led to learner self-directed activities, including but not limited to hand-on labs. Hence, both a structured assignment involving reading and written reflection and an open-ended, hands-on investigation could be considered inquiry as long as they involve the five essential features identified above.

The ultimate goals of inquiry-based instruction are to engage learners, develop their conceptual understanding of the natural world around them, and to overcome misconceptions in science.

Inquiry-based activities should balance students' application of content knowledge, creativity and critical thinking in order to analyze data, solve a problem or address a unique question.

21st Century Skills in Science

Colorado's Description of 21st Century Skills

Colorado's description of 21st century skills is a synthesis of the essential abilities students must apply in our rapidly changing world. Today's students need a repertoire of knowledge and skills that are more diverse, complex, and integrated than any previous generation. These skills do not stand alone in the standards, but are woven into the evidence outcomes, inquiry questions, and application and are within the nature of science. Science inherently demonstrates each of Colorado's 21st century skills, as follows:

Critical Thinking and Reasoning

Science requires students to analyze evidence and draw conclusions based on that evidence. Scientific investigation involves defining problems and designing studies to test hypotheses related to those problems. In science, students must justify and defend scientific explanations and distinguish between correlation and causation.

Information Literacy

Understanding science requires students to research current ideas about the natural world. Students must be able to distinguish fact from opinion and truth from fantasy. Science requires a degree of skepticism because the ideas of science are subject to change. Science students must be able to understand what constitutes reliable sources of information and how to validate those sources. One key to science is understanding that converging different lines of evidence from multiple sources strengthens a scientific conclusion.

Collaboration

Science students must be able to listen to others' ideas, and engage in scientific dialogs that are based on evidence – not opinion. These types of conversations allow them to compare and evaluate the merit of different ideas. The peer review process helps to ensure the validity of scientific explanations.

Self-Direction

Students in science must have persistence and perseverance when exploring scientific concepts. Students must generate their own questions, and design investigations to find the answers. Students must be open to revising and redefining their thinking based on evidence.

Invention

Designing investigations and engineering new products involves a large degree of invention. Scientists and engineers often have to think "outside the box" as they push the limits of our current knowledge. They must learn from their failures to take the next steps in understanding. Science students also must integrate ideas from multiple disciplines to formulate an understanding of the natural world. In addition to using invention to design investigations, scientists also use findings from investigations to help them to invent new products.

4th Grade Overview

Course Description

In fourth grade science, students will be practicing scientific skills such as writing questions, making predictions, organizing data and developing logical conclusions. Students will write about investigations in science notebooks and represent data using graphs and tables. Science content in fourth grade will include electricity, magnetism, adaptation and variation in organisms, fossils, ecosystems, the Solar System, and the nature of science.

Topics at a Glance

- Energy
- Fossils
- Variation
- Ecosystems
- Magnetism
- Adaption
- Solar System
- Electricity

Assessments

- Teacher created assessments
- Foss Kit Assessments
- Science Notebooks

Grade Level Expectations

Standard	Big Ideas for Fourth Grade
1. Physical Science	1. Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical
2. Life Science	1. All living things share similar characteristics, but they also have differences that can be described and classified 2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today 3. There is interaction and interdependence between and among living and nonliving components of systems
3. Earth Systems Science	1. Earth is part of the Solar System, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth

Notes on Instructional Materials

- New *Seeds of Science and Roots of Reading Variation and Adaptation* kit addresses Life Science standard on variation and adaptation.
- Fossils is a brand new concept to fourth grade (2013-2014) (*The Fossil Kit*- CU Museum and Investigation 2 of *Seeds and Roots Variation and Adaptation* address these standards)

1. Physical Science

Students know and understand common properties, forms and changes in matter and energy.

Prepared Graduates
The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared Graduate Competencies in the Physical Science standard:

- Observe, explain, and predict natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects
- Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions
- Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable
- *Engage in scientific inquiry by asking or responding to scientifically oriented questions, collecting and analyzing data, giving priority to evidence, formulating explanations based on evidence, connecting explanations to scientific knowledge, and communicating and justifying explanations.*

Content Area: Science - Fourth Grade

Standard: 1. Physical Science

Prepared Graduates:

Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable

GRADE LEVEL EXPECTATION

Concepts and skills students master:

1. Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical

Evidence Outcomes	21st Century Skills and Readiness Competencies
Students can: a. Identify and describe the variety of energy sources b. Show that electricity in circuits requires a complete loop through which current can pass *c. Describe the effect of magnetic force on different objects* *d. Recognize that magnets are attracted to objects containing iron* e. Describe the energy transformation that takes place in electrical circuits where light, heat, sound, and magnetic effects are produced f. Use multiple resources – including print, electronic, and human – to locate information about different sources of renewable and nonrenewable energy	**Inquiry Questions:** 1. How do we know that energy exists within a system such as in an electrical circuit? 2. How can heat be transferred from one object to another? *3. How does using energy impact the environment?* *4. How does the effect on the environment change when using more/ or using less energy?*
	Relevance and Application: 1. There are multiple energy sources, both renewable and nonrenewable. 2. Energy can be used or stored. For example, it can be stored in a battery and then used when running a portable media player such as an iPod. 3. Transportation, manufacturing, and technology are driven by energy.
	Nature of Discipline: 1. Ask testable questions about energy, make a falsifiable hypothesis, design an inquiry based method of finding the answer, collect data, and form a conclusion. 2. Understand that models are developed to explain and predict phenomena that cannot be directly observed. 3. Critically evaluate models of energy, identifying the strengths and weaknesses of the model in representing what happens in the real world. 4. Create plans to decrease electrical energy use for one week and evaluate the results. *(for example, a tally chart of lights on and off, energy bill, etc.)*

2. Life Science

Students know and understand the characteristics and structure of living things, the processes of life and how living things interact with each other and their environment.

Prepared Graduates
The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared Graduate Competencies in the Life Science standard:

- Analyze the relationship between structure and function in living systems at a variety of organizational levels, and recognize living systems' dependence on natural selection
- Explain and illustrate with examples how living systems interact with the biotic and abiotic environment
- Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment
- Explain how biological evolution accounts for the unity and diversity of living organisms

Content Area: Science - Fourth Grade

Standard: 2. Life Science

Prepared Graduates:

Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment

GRADE LEVEL EXPECTATION

Concepts and skills students master:

1. All living things share similar characteristics, but they also have differences that can be described and classified

Evidence Outcomes	21st Century Skills and Readiness Competencies
Students can: a. Use evidence to develop a scientific explanation of what plants and animals need to survive b. Use evidence to develop a scientific explanation for similarities and/or differences among different organisms (species) c. Analyze and interpret data representing variation in a trait *d. Classify organisms based on their traits and justify the classification.* e. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate questions about characteristics of living things	**Inquiry Questions:** 1. How have classification systems changed over time? *(i.e. as we get more information about an organism its classification could change.)* 2. How are individuals in a related species similar and different?
	Relevance and Application: 1. Human beings use technology, such as heating and air conditioning, in order to live comfortably in a variety of climates. *2. Outdoor habitats (for example: Sombrero Marsh or the school yard) provide rich opportunities to study variation and adaptation in the local ecosystem.*
	Nature of Discipline: 1. Understand that all scientific knowledge is subject to new findings and that the presence of reproducible results yields a scientific theory. 2. Evaluate and provide feedback on evidence used by others to justify how they classified organisms.

Content Area: Science - Fourth Grade

Standard: 2. Life Science

Prepared Graduates:

Explain how biological evolution accounts for the unity and diversity of living organisms

GRADE LEVEL EXPECTATION

Concepts and skills students master:

2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today

Evidence Outcomes	21st Century Skills and Readiness Competencies
Students can: a. Use evidence to develop a scientific explanation for: 1. What fossils tell us about a prehistoric environment 2. What conclusions can be drawn from similarities between fossil evidence and living organisms b. Analyze and interpret data to generate evidence about the prehistoric environment c. Evaluate whether reasoning and conclusions about given fossils are supported by evidence d. Use computer simulations that model and recreate past environments for study and entertainment	**Inquiry Questions:** 1. What are some things fossils *can tell us about the past?* 2. What conditions would most likely lead to something becoming a fossil? **Relevance and Application:** 1. Computers are used to model and recreate past environments for study and entertainment. **Nature of Discipline:** 1. Ask testable questions about past environments. 2. Make predictions about past environments based on fossil evidence. 3. Recognize that different interpretations of evidence are possible.

Content Area: Science - Fourth Grade

Standard: 2. Life Science

Prepared Graduates:

Explain and illustrate with examples how living systems interact with the biotic and abiotic environment

GRADE LEVEL EXPECTATION

Concepts and skills students master:

3. There is interaction and interdependence between and among living and nonliving components of ecosystems

Evidence Outcomes	21st Century Skills and Readiness Competencies
Students can: a. Use evidence to develop a scientific explanation on how organisms adapt to their habitat b. Identify the components that make a habitat type unique c. Compare and contrast different habitat types d. Create and evaluate models of the flow of nonliving components or resources through an ecosystem *(for example, food web)* e. Make a plan to positively impact a local ecosystem f. Examine, evaluate, question, and ethically use information from a variety of sources and media to investigate endangered habitats	**Inquiry Questions:** 1. How are resources shared among organisms in a specific ecosystem or habitat? 2. How do nonliving components *(soil, sun, weather, water, etc.)* of an ecosystem *or habitat* influence living components? 3. What would happen if the Sun's energy no longer reached Earth? 4. What would happen if water were removed from an ecosystem?
	Relevance and Application: 1. Humans can have positive and negative impacts on an ecosystem. 2. Nonliving components are cycled and recycled through ecosystems and need to be protected and conserved. 3. *Outdoor habitats (for example: Sombrero Marsh or the school yard) provide rich opportunities to study the interaction and interdependence among organisms.*
	Nature of Discipline: 1. Understand that models are developed to explain and predict natural phenomena that cannot be directly observed because they happen over long periods of time. 2. Evaluate models that show interactions between living and nonliving components of ecosystems, identifying the strengths and weaknesses of the model in representing what happens in the real world.

3. Earth Systems Science

Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.

Prepared Graduates:
The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared Graduate Competencies in the Earth Systems Science standard:

- Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet
- Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system
- Describe how humans are dependent on the diversity of resources provided by Earth and Sun

Content Area: Science - Fourth Grade

Standard: 3. Earth Systems Science

Prepared Graduates:

Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet

GRADE LEVEL EXPECTATION

Concepts and skills students master:

1. Earth is part of the Solar System, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth

Evidence Outcomes	21st Century Skills and Readiness Competencies
Students can: a. Gather, analyze, and interpret data about components of the Solar System b. Utilize direct and indirect evidence to investigate the components of the Solar System c. Gather, analyze, and interpret data about the sunrise and sunset, and Moon movements and phases *d. Explain the tilt of the Earth on its axis causes the seasons* *e. Identify that gravity is the force that holds the parts of the Solar System together* f. Develop a scientific explanation regarding relationships of the components of the Solar System	**Inquiry Questions:** 1. What are the patterns of movement for the Sun and Moon across the sky as *observed from Earth?* 2. How does Earth compare to other objects orbiting the Sun? 3. How do we study the Solar System? *(i.e. models, photographs, space observation from Earth, etc.)* **Relevance and Application:** 1. Space exploration has produced data to answer questions about the Solar System. 2. Comets are observable objects seen from Earth which provide scientists data about the Solar System. 3. Orbits in a predictable pattern in space influence season's on Earth. **Nature of Discipline:** 1. Understand that models are developed to explain and predict natural phenomena that cannot be directly observed because they happen over long periods of time. 2. Critically evaluate models of the Solar System, identifying the strengths and weaknesses of the model in representing what happens in the real Solar System.

Prepared Graduate Competencies in Science

The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

Prepared Graduates:

- Observe, explain, and predict natural phenomena governed by Newton's laws of motion, acknowledging the limitations of their application to very small or very fast objects
- Apply an understanding of atomic and molecular structure to explain the properties of matter, and predict outcomes of chemical and nuclear reactions
- Apply an understanding that energy exists in various forms, and its transformation and conservation occur in processes that are predictable and measurable
- Analyze the relationship between structure and function in living systems at a variety of organizational levels, and recognize living systems' dependence on natural selection
- Explain and illustrate with examples how living systems interact with the biotic and abiotic environment
- Analyze how various organisms grow, develop, and differentiate during their lifetimes based on an interplay between genetics and their environment
- Explain how biological evolution accounts for the unity and diversity of living organisms
- Describe and interpret how Earth's geologic history and place in space are relevant to our understanding of the processes that have shaped our planet
- Evaluate evidence that Earth's geosphere, atmosphere, hydrosphere, and biosphere interact as a complex system
- Describe how humans are dependent on the diversity of resources provided by Earth and Sun
- *Engage in scientific inquiry by asking or responding to scientifically oriented questions, collecting and analyzing data, giving priority to evidence, formulating explanations based on evidence, connecting explanations to scientific knowledge, and communicating and justifying explanations.*

Standard	Grade Level Expectation
High School	
1. Physical Science	1. Newton's laws of motion and gravitation describe the relationships among forces acting on and between objects, their masses, and changes in their motion – but have limitations 2. Matter has definite structure that determines characteristic physical and chemical properties 3. Matter can change form through chemical or nuclear reactions abiding by the laws of conservation of mass and energy 4. Atoms bond in different ways to form molecules and compounds that have definite properties 5. Energy exists in many forms such as mechanical, chemical, electrical, radiant, thermal, and nuclear, that can be quantified and experimentally determined 6. When energy changes form, it is neither created not destroyed; however, because some is necessarily lost as heat, the amount of energy available to do work decreases
2. Life Science	1. Matter tends to be cycled within an ecosystem, while energy is transformed and eventually exits an ecosystem 2. The size and persistence of populations depend on their interactions with each other and on the abiotic factors in an ecosystem 3. Cellular metabolic activities are carried out by biomolecules produced by organisms 4. The energy for life primarily derives from the interrelated processes of photosynthesis and cellular respiration. Photosynthesis transforms the sun's light energy into the chemical energy of molecular bonds. Cellular respiration allows cells to utilize chemical energy when these bonds are broken. 5. Cells use the passive and active transport of substances across membranes to maintain relatively stable intracellular environments 6. Cells, tissues, organs, and organ systems maintain relatively stable internal environments, even in the face of changing external environments 7. Physical and behavioral characteristics of an organism are influenced to varying degrees by heritable genes, many of which encode instructions for the production of proteins 8. Multicellularity makes possible a division of labor at the cellular level through the expression of select genes, but not the entire genome 9. Evolution occurs as the heritable characteristics of populations change across generations and can lead populations to become better adapted to their environment

Standard	Grade Level Expectation
High School (continued)	
3. Earth Systems Science	1. The history of the universe, solar system and Earth can be inferred from evidence left from past events 2. As part of the solar system, Earth interacts with various extraterrestrial forces and energies such as gravity, solar phenomena, electromagnetic radiation, and impact events that influence the planet's geosphere, atmosphere, and biosphere in a variety of ways 3. The theory of plate tectonics helps to explain geological, physical, and geographical features of Earth 4. Climate is the result of energy transfer among interactions of the atmosphere, hydrosphere, geosphere, and biosphere 5. There are costs, benefits, and consequences of exploration, development, and consumption of renewable and nonrenewable resources 6. The interaction of Earth's surface with water, air, gravity, and biological activity causes physical and chemical changes 7. Natural hazards have local, national and global impacts such as volcanoes, earthquakes, tsunamis, hurricanes, and thunderstorms
Eighth Grade	
3. Earth Systems Science	1. Weather is a result of complex interactions of Earth's atmosphere, land and water, that are driven by energy from the sun, and can be predicted and described through complex models 2. Earth has a variety of climates defined by average temperature, precipitation, humidity, air pressure, and wind that have changed over time in a particular location 3. The solar system is comprised of various objects that orbit the Sun and are classified based on their characteristics 4. The relative positions and motions of Earth, Moon, and Sun can be used to explain observable effects such as seasons, eclipses, and Moon phases 5. Major geologic events such as earthquakes, volcanic eruptions, mid-ocean ridges, and mountain formation are associated with plate boundaries and attributed to plate motions 6. Geologic time, history, and changing life forms are indicated by fossils and successive sedimentation, folding, faulting, and uplifting of layers of sedimentary rock 7. Complex interrelationships exist between Earth's structure and natural processes that over time are both constructive and destructive 8. Water on Earth is distributed and circulated through oceans, glaciers, rivers, ground water, and the atmosphere 9. Earth's natural resources provide the foundation for human society's physical needs. Many natural resources are nonrenewable on human timescales, while others can be renewed or recycled

Standard	Grade Level Expectation
Seventh Grade	
2. Life Science	1. Individual organisms with certain traits are more likely than others to survive and have offspring in a specific environment 2. The human body is composed of atoms, molecules, cells, tissues, organs, and organ systems that have specific functions and interactions 3. Cells are the smallest unit of life that can function independently and perform all the necessary functions of life 4. Photosynthesis and cellular respiration are important processes by which energy is acquired and utilized by organisms 5. Multiple lines of evidence show the evolution of organisms over geologic time 6. Human activities can deliberately or inadvertently alter ecosystems and their resiliency 7. Organisms reproduce and transmit genetic information (genes) to offspring, which influences individuals' traits in the next generation 8. Changes in environmental conditions can affect the survival of individual organisms, populations, and entire species 9. Organisms interact with each other and their environment in various ways that create a flow of energy and cycling of matter in an ecosystem
Sixth Grade	
1. Physical Science	1. Identify and calculate the direction and magnitude of forces that act on an object, and explain the results in the object's change of motion 2. There are different forms of energy, and those forms of energy can be changed from one form to another – but total energy is conserved 3. Distinguish between physical and chemical changes, noting that mass is conserved during any change 4. Recognize that waves such as electromagnetic, sound, seismic, and water have common characteristics and unique properties 5. Mixtures of substances can be separated based on their properties such as solubility, boiling points, magnetic properties, and densities 6. All matter is made of atoms, which are far too small to see directly through a light microscope. Elements have unique atoms and thus, unique properties. Atoms themselves are made of even smaller particles 7. Atoms may stick together in well-defined molecules or be packed together in large arrangements. Different arrangements of atoms into groups compose all substances. 8. The physical characteristics and changes of solid, liquid, and gas states can be explained using the particulate model 9. Distinguish among, explain, and apply the relationships among mass, weight, volume, and density

Standard	Grade Level Expectation
Fifth Grade	
1. Physical Science	1. Mixtures of matter can be separated regardless of how they were created; all weight and mass of the mixture are the same as the sum of weight and mass of its parts
2. Life Science	1. All organisms have structures and systems with separate functions 2. Human body systems have basic structures, functions, and needs
3. Earth Systems Science	1. Earth and sun provide a diversity of renewable and nonrenewable resources 2. Earth's surface changes constantly through a variety of processes and forces 3. Weather conditions change because of the uneven heating of Earth's surface by the Sun's energy. Weather changes are measured by differences in temperature, air pressure, wind and water in the atmosphere and type of precipitation
Fourth Grade	
1. Physical Science	1. Energy comes in many forms such as light, heat, sound, magnetic, chemical, and electrical
2. Life Science	1. All living things share similar characteristics, but they also have differences that can be described and classified 2. Comparing fossils to each other or to living organisms reveals features of prehistoric environments and provides information about organisms today 3. There is interaction and interdependence between and among living and nonliving components of systems
3. Earth Systems Science	1. Earth is part of the solar system, which includes the Sun, Moon, and other bodies that orbit the Sun in predictable patterns that lead to observable paths of objects in the sky as seen from Earth
Third Grade	
1. Physical Science	1. Matter exists in different states such as solids, liquids, and gases and can change from one state to another by heating and cooling
2. Life Science	1. The duration and timing of life cycle events such as reproduction and longevity vary across organisms and species
3. Earth Systems Science	1. Earth's materials can be broken down and/or combined into different materials such as rocks, minerals, rock cycle, formation of soil, and sand – some of which are usable resources for human activity
Second Grade	
1. Physical Science	1. Changes in speed or direction of motion are caused by forces such as pushes and pulls.
2. Life Science	1. Organisms depend on their habitat's nonliving parts to satisfy their needs 2. Each plant or animal has different structures or behaviors that serve different functions
3. Earth Systems Science	1. Weather and the changing seasons impact the environment and organisms such as humans, plants, and other animals

Standard	Grade Level Expectation
First Grade	
1. Physical Science	1. Solids and liquids have unique properties that distinguish them
2. Life Science	1. Offspring have characteristics that are similar to but not exactly like their parents' characteristics 2. An organism is a living thing that has physical characteristics to help it survive
3. Earth Systems Science	1. Earth's materials can be compared and classified based on their properties
Kindergarten	
1. Physical Science	1. Objects can move in a variety of ways that can be described by speed and direction 2. Objects can be sorted by physical properties, which can be observed and measured
2. Life Science	1. Organisms can be described and sorted by their physical characteristics
3. Earth Systems Science	1. The sun provides heat and light to Earth
Preschool	
1. Physical Science	1. Objects have properties and characteristics 2. There are cause-and-effect relationships in everyday experiences
2. Life Science	1. Living things have characteristics and basic needs 2. Living things develop in predictable patterns
3. Earth Systems Science	1. Earth's materials have properties and characteristics that affect how we use those materials 2. Events such as night, day, the movement of objects in the sky, weather, and seasons have patterns

Glossary of Terms

Academic Vocabulary This is the list of words students should know and understand the meaning of.
Standard 1: attract, battery, circuit, closed circuit, component, conductor, d-cell, direction, electricity, energy, filament, force, heat, insulator, light, magnet, magnetism, mass, matter, property, receiver, repel, sound, source, substance, switch, transfer, work
Standard 2: characteristic, classify, ecosystem, fossil, habitat, living, non-living, nutrient, organism, trait
Standard 3: axis, day, earth, gravity, moon, moon phases, night, orbit, planet, revolution, rotation, solar system, star, sun, year
General science vocabulary: conclusion, data, evidence, explanation, observation, prediction, record

Glossary The purpose of this list is to provide words and definitions for teachers to use to help make these concepts clear for students.	
Word	**Definition**
Attract	to cause to draw near or adhere by physical force
Axis	an imaginary line through a body, about which it rotates
Battery	a single cell, such as a D-cell, that produces an electric current
Characteristic	a feature that helps to identify, tell apart, or describe recognizably; a distinguishing trait
Circuit	a path followed or capable of being followed by an electric current
Classify	group organisms into categories on the basis of evolutionary or structural relationships between them
Closed circuit	a closed path followed or capable of being followed by an electric current
Component	a single part of a larger system
Conclusion	a judgment or decision reached by reasoning
Conductor	a substance or medium that conducts an electric charge
Data	factual information (as measurements or statistics) used as a basis for reasoning, discussion, or calculation
Day	the period of light between dawn and nightfall; the interval from sunrise to sunset; the 24-hour period during which the earth completes one rotation on its axis
D-cell	a source of electricity; also known as a battery
Direction	the line or course along which a thing moves
Earth	the third planet from the sun
Ecosystem	a biological community of interacting organisms and their physical environment
Electricity	a form of energy resulting from the existence of charged particles (such as electrons or protons), either statically as an accumulation of charge or dynamically as a current
Energy	the capacity of a physical system to do work
Evidence	information acquired through objective experience
Explanation	a statement based on scientific evidence and logical argument about causes and effects or relationships between variables
Filament	the material in a light bulb (usually a thin wire) that glows when heated by an electric current
Force	an influence tending to change the motion of a body or produce motion or stress in a stationary body; a push or a pull
Fossil	a remnant or trace of an organism of a past geologic age, such as a skeleton or leaf imprint, embedded and preserved in the Earth's crust
Gravity	the force that attracts a body towards the center of the earth, or towards any other physical body having mass

Habitat	the area or environment where an organism or ecological community normally lives or occurs
Heat	a form of energy associated with the motion of atoms or molecules and capable of being transmitted through solid and fluid media by conduction, through fluid media by convection, and through empty space by radiation
Insulator	a material that prevents the flow of electricity
Light	electromagnetic radiation that can produce a visual sensation
Living	alive, having life, not dead
Magnet	an object that sticks to iron
Magnetism	the property displayed by magnets and produced by the motion of electric charges, which results in attraction or repulsion between objects
Mass	the quantity of matter which a body contains, as measured by its acceleration under a given force or by the force exerted on it by a gravitational field
Matter	physical substance or material in general, that which occupies space and possesses mass
Moon	the natural satellite of the earth
Moon Phases	one of the cyclically recurring apparent forms of the moon
Night	the period between sunset and sunrise, especially the hours of darkness
Non-Living	not alive; referring to something that has never been alive
Nutrient	any substance that can be metabolized by an organism to give energy and build tissue
Observation	the act of making and recording a measurement
Orbit	the path of a celestial body or an artificial satellite as it revolves around another body
Organism	a living thing that has (or can develop) the ability to act or function independently
Plant	a living thing that makes its own food and usually has leaves, stems and roots
Prediction	a statement about what one thinks will happen in an investigation
Property	something that can be known by looking at or feeling an object; something one can observe
Record	to set down for preservation in writing or other permanent form
Repel	push away, as similar poles of two magnets push away from one another
Revolution	the action by a celestial body of going round in an orbit or elliptical course
Rotation	the act or process of turning around a center or an axis
Solar System	a system of planets or other bodies orbiting another star
Sound	vibrations transmitted through an elastic solid or a liquid or gas, capable of being detected by human organs of hearing
Source	the point or device from which electricity flows
Star	a celestial body of hot gases that radiates energy derived from thermonuclear reactions in the interior
Substance	a particular kind of matter with uniform properties
Sun	the star round which the earth orbits
Switch	device used to open and close circuits
Trait	a characteristic or condition such as eye color
Transfer	to convey or cause to pass from one place or thing to another
Work	the transfer of energy from one physical system to another, especially the transfer of energy to a body by the application of a force that moves the body in the direction of the force
Year	the time taken by the earth to make one revolution around the sun