

## ICS Elementary Science Standards

The documents used in drafting these science standards include the Georgia Department of Education Science Standards, American Education Reaches Out (AERO), the Florida Department of Education 2008 Science Standards, and the Nevada Department of Education Science Standards.

### Kindergarten

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

K.N1.a	Make observations of the natural world and collect data using the five senses.
K.N1.b	Collaborate with a partner to collect information.
K.N1.c	Recognize that learning can come from observation.
K.N1.d	Recognize the design of God in creation.

**N2: Students design and conduct scientific activities.**

K.N2.a	Observe and draw an object, including its major features.
K.N2.b	Use ordinary hand tools and instruments to measure and look at objects (balance scales, magnifiers).
K.N2.c	Keep simple records, such as pictorial records, of investigations conducted.
K.N2.d	Compare different sizes, ages, speeds, and weights of both manmade and natural things.

**N3: Students clearly communicate scientific ideas and activities.**

K.N3.a	Use a model (toy or picture) to describe a feature of the primary thing.
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## Physical Science

**P1: Students demonstrate understanding that all objects and substances in the world are made of matter and have observable properties.**

K.P1.a	Know that matter can exist as solids and as liquids.
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K.P1.b	Sort objects by observable properties, such as size, shape, color, temperature (hot or cold), weight (heavy or light) and texture.
K.P1.c	Use senses to classify common materials of different composition (clay, cloth, paper, plastic, etc.).
K.P1.d	Know that water can be a liquid or a solid and that it can go back and forth from one to the other.
K.P1.e	Recognize that the shape of materials such as paper and clay can be changed by cutting, tearing, crumpling, smashing, or rolling.

**P2: Students demonstrate understanding that position and motion of objects can be observed, described, and measured.**

K.P2.a	Investigate that things move in different ways, such as fast or slow.
K.P2.b	Observe that a push or a pull can change the way an object moves.
K.P2.c	Explore, with assistance, moving objects with magnets.

**P3: Students demonstrate an understanding of light and sound.**

K.P3.a	Use objects to create shadows.
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## Earth Science

**E1: Students demonstrate an understanding of how climate, weather, and the water cycle influence and are influenced by key features of the Earth and sky.**

K.E1.a	Describe the different states of water (solid, liquid, gas).
K.E1.b	Know simple use and care of Earth's resources.
K.E1.c	Describe simple characteristics of seasons and change in weather.

**E2: Students demonstrate an understanding of the composition and structure of the Earth.**

K.E2.a	Recognize earth materials – soil, rocks, water, and air.
K.E2.b	Sort rocks according to size, shape, texture, and color.
K.E2.c	Observe soils by physical attributes such as smell, texture, color, and particle size.

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## Life Science

**L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

K.L1.a	Recognize the difference between living organisms and non-living materials.
K.L1.b	Group animals according to observable features (appearance, size, motion, etc.).
K.L1.c	Group plants according to observable features (appearance, size, etc.)
K.L1.d	Recognize beauty and variety in the creations of God.

**L2: Students demonstrate an understanding of how and why organisms are dependent on one another and their environments.**

K.L2.a	Know that animals eat plants or other animals for food.
K.L2.b	Know that living things are found almost everywhere in the world.
K.L2.c	Describe the basic needs of animals (water, food, air, shelter, etc.).

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**L3: Students demonstrate understanding that living things have identifiable characteristics.**

K.L3.a	Explain the similarities and differences in animals (appearance, size, color, etc.).
K.L3.b	Explain the similarities and differences in plants (appearance, size, color, etc.).
K.L3.c	Recognize the similarities and differences between parent and baby.
K.L3.d	Match pictures of animal parents with animal babies.
K.L3.e	Recognize how animals move and grow.

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### Grade 1

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

1.N1.a	Ask grade-appropriate questions about the world around them and exhibit willingness to seek answers to questions by observing, experimenting, and predicting the outcome of an investigation.
1.N1.b	Know that when a science investigation is repeated, the results should be consistent.
1.N1.c	Recognize the design of God in creation.

**N2: Students design and conduct scientific activities.**

1.N2.a	Use grade-appropriate hand tools and instruments to construct, measure, and look at objects.
1.N2.b	Identify and practice accepted safety procedures when using tools and instruments.
1.N2.c	Use five senses to make observations in terms of number, shape, texture, size, weight, color and motion.
1.N2.d	Keep grade-appropriate records of investigations.

**N3: Students clearly communicate scientific ideas and activities.**

1.N3.a	Draw pictures that correctly portray features of an object being observed.
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**Physical Science**

**P1: Students demonstrate understanding that position and motion of objects can be observed, described, and measured.**

1.P1.a	Demonstrate and describe ways that objects can move (straight line, zigzag, back-and-forth, round-and-round, fast, slow).
1.P1.b	Demonstrate changing the motion of objects by applying a push or a pull.
1.P1.c	Identify and explain how man-made mechanisms aid movement.
1.P1.d	Demonstrate knowledge that magnets can be used to move things.

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1.P1.e	Demonstrate how magnets attract and repel.
1.P1.f	Identify objects that are attracted to magnets.
1.P1.g	Identify objects that do not block magnetic force.
1.P1.h	Demonstrate the effects of a magnet on objects made with iron and on other magnets.
1.P1.i	Demonstrate the effects of speed changes on an object.

**P2: Students demonstrate an understanding of light and sound.**

1.P2.a	Recognize sources of light.
1.P2.b	Explain how shadows are made.

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## Earth Science

**E1: Students demonstrate an understanding of how climate, weather and the water cycle influence and are influenced by key features of the Earth and sky.**

1.E1.a	Explain how the seasons and weather follow various patterns in different parts of the world.
1.E1.b	Describe the differences in the four seasons.
1.E1.c	Know that weather changes from day to day and seasonally.
1.E1.d	Recognize changes in water when it freezes (ice) and when it melts (water).
1.E1.e	Identify forms of precipitations (rain, snow, sleet, hailstones) as either solid (ice) or liquid (water).
1.E1.f	Explain the stages of the water cycle.

**E2: Students demonstrate understanding that there are many components of the universe.**

1.E2.a	Identify various objects seen in the sky.
1.E2.b	Know that the Sun is a star and that it is a source of heat and light.

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1.E2.c	Explain when the Sun, Moon, and stars can be seen and why they are seen at that time.
1.E2.d	Know that some stars are smaller and some are larger, that stars do not all have the same color or brightness, and that there are more stars in the sky than can be counted.
1.E2.e	Recognize created order in the universe.

## Life Science

**L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

1.L1.a	Know some plants and animals are extinct.
1.L1.b	Explain the similarities and differences in the way plants and animals look and in what they do.
1.L1.c	Differentiate between living and nonliving things.
1.L1.d	Recognize beauty and variety in the creations of God.

**L2: Students demonstrate an understanding of how and why organisms are dependent on one another and their environments.**

1.L2.a	Know that animals eat plants or other animals for food.
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1.L2.b	Know that living things are found almost everywhere in the world and explain why different kinds of plants and animals live in different places.
1.L2.c	Make observations of living things and their environment using the five senses.
1.L2.d	Identify the basic needs of a plant.
1.L2.e	Identify the basic needs of an animal.

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### Grade 2

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

2.N1.a	Raise questions about the world around them and investigate answers to questions by making careful observations and measurements and trying to figure things out.
2.N1.b	Distinguish between observation (see, hear, feel, smell, taste) and ideas or inferences (think).
2.N1.c	Explain why it is helpful to work with a team and to share findings.
2.N1.d	Know there are a variety of sizes, speeds, and weights of natural and man-made objects.
2.N1.e	Recognize the design of God in creation.

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**N2: Students design and conduct scientific activities.**

2.N2.a	Use numbers, words, or drawings to order, count, identify, measure, and describe things and experiences.
2.N2.b	Give estimates of lengths, weights, and time intervals, and check them by measuring.
2.N2.c	Compare observations made by different groups using the same tools.
2.N2.d	Select and safely use ordinary hand tools to conduct scientific investigation.
2.N2.e	Know how to assemble, take apart, and reassemble constructions.
2.N2.f	Make a model, invention, or tool that can actually be used to perform a task.

**N3: Students clearly communicate scientific ideas and activities.**

2.N3.a	Explain how particular investigations should have similar conclusions when repeated.
2.N3.b	Use gathered data to draw conclusions or make predictions.
2.N3.c	Sort objects based on observable patterns and make predictions.
2.N3.d	Describe and compare things using number, shape, texture, size, weight, color, and motion.

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2.N3.e	Communicate data using simple pictographs and bar graphs.
2.N3.f	Describe changes in size, weight, color, and movement of an object, and recognize which other qualities of the object did not change.

## Physical Science

**P1: Students demonstrate understanding that all objects and substances in the world are made of matter and have observable properties.**

2.P1.a	Identify the three common states of matter (solid, liquid, gas).
2.P1.b	Know that processes can change some properties of materials, but not all material respond the same way.
2.P1.c	Classify objects in terms of the materials they are made of and their physical properties.
2.P1.d	Investigate changes in objects created by tearing, dissolving, melting, etc.
2.P1.e	Recognize that solids have a definite shape and that liquids and gases take the shape of their container.
2.P1.f	Measure and compare temperatures of water samples taken every day at the same time.

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2.P1.g	Measure and compare volume of liquids using containers of various shapes and sizes.
2.P1.h	Sort objects by observable properties.

**P2: Students demonstrate an understanding of the different forms and transformations of energy and the significance of energy in understanding matter.**

2.P2.a	Know that heat is a form of energy that makes things warm.
2.P2.b	Explain that heat can be produced in various ways (burning, friction, mixing substances together).
2.P2.c	Identify sources of light energy, heat energy, and energy of motion.
2.P2.d	Describe uses of light, heat, and motion energy.
2.P2.e	Recognize that people use a form of energy to cook their food, cool or warm their houses, and power their cars.
2.P2.f	Investigate the transfer of heat energy from the Sun to various objects.
2.P2.g	Know the importance of conserving energy and explain various ways to do it.

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## Earth Science

**E1: Students demonstrate an understanding of how climate, weather, and the water cycle influence and are influenced by key features of the Earth and sky.**

2.E1.a	Know that the amount of water is the same before and after freezing.
2.E1.b	Recognize the basic features of the Earth.
2.E1.c	Compare and describe changing patterns in nature that repeat themselves, such as weather conditions day to day and season to season.
2.E1.d	Investigate the Sun's direct and indirect warming effects on water and land.
2.E1.e	Investigate and describe how water left in an open container evaporates, but water in a closed container does not.
2.E1.f	Investigate that air is all around us and that moving air is wind.

**E2: Students demonstrate an understanding of the composition and structure of the Earth.**

2.E2.a	Recognize that Earth is made up of rocks, which come in many shapes and sizes.
2.E2.b	Explain the process by which soil is formed and how pieces of rock and dead plant and animal parts can be the basis of soil.
2.E2.c	Classify soil types according to texture, color, water retention, and ability to support growth of plants.

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2.E2.d	Explain the difference between rock and mineral.
2.E2.e	Categorize rocks and minerals using observation (shape, color, texture), measurement, and simple tests (hardness).
2.E2.f	Determine the effects of water, ice, and wind on rocks and soil over time using observation and research.
2.E2.g	Investigate fossils and describe how a fossil is formed.
2.E2.h	Demonstrate that energy from the Sun can heat the Earth's surface and that when the Sun is not present, heat may be lost.
2.E2.i	Observe and record change in the Earth's surface and infer the causes of the change.

## Life Science

### **L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

2.L1.a	Investigate and describe the life cycle of various living organisms (common animals and plants).
2.L1.b	Identify fossils as the remains or imprints of once-living organisms.
2.L1.c	Know that some extinct organisms are similar to existing organisms and some are different.
2.L1.d	Identify fungi as living organisms.
2.L1.e	Recognize beauty and variety in the creations of God.

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**L2: Students demonstrate understanding that living things have identifiable characteristics.**

2.L2.a	Identify features of different plants and animals that help them survive in their environment.
2.L2.b	.Describe seasonal changes of different plants.
2.L2.c	Describe differences among individuals of the same kind of plant or animal.
2.L2.d	Identify the structures in plants and their role in food production.
2.L2.e	Describe how plants respond to heat, light, and gravity.
2.L2.f	Sort animals into major groups according to their physical characteristics and behaviors.
2.L2.g	Sort plants into major groups according to their physical characteristics.

**L3: Students demonstrate an understanding of how and why organisms are dependent on one another and their environment.**

2.L3.a	Identify the basic needs of living organisms.
2.L3.b	Know that humans and animals need to consume food and that plants need light to produce their food.
2.L3.c	Describe examples of simple food chains.

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2.L3.d	Explain the term extinct, give examples of extinct organisms, and identify possible reasons why the organisms are extinct.
2.L3.e	Explain how an organism's senses are used to find out about and interact with the environment including finding food, warning of danger, and interacting with other organism.

**L4: Students demonstrate an understanding of the organization and development of living organisms.**

2.L4.a	Recognize that a human baby grows inside its mother for about nine months until its birth.
2.L4.c	Know that humans learn at different rates.

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### Grade 3

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honest, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

3.N1.a	Locate information using books, newspapers, magazines, computer databases.
3.N1.b	Recognize that similar scientific investigations seldom produce exactly the same results.
3.N1.c	Distinguish observations from ideas, speculations, and predications.
3.N1.d	Describe some of the different forms of scientific investigation.
3.N1.e	Recognize the design of God in creation.

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**N2: Students design and conduct scientific activities.**

3.N2.a	Choose appropriate materials and devices for simple constructions and capturing information.
3.N2.b	Investigate through collecting specimens for analysis and doing experiments.
3.N2.c	Know that thermometers, hand lenses, and rulers are useful in gaining information.

**N3: Students clearly communicate scientific ideas and activities.**

3.N3.a	Keep accurate records of investigations and observations.
3.N3.b	Suggest reasons for findings and consider reasons given by others.
3.N3.c	Explain why accurate descriptions are important in science.
3.N3.d	Know how to write instructions that others can follow.
3.N3.e	Use a model (picture or toy) to describe the features of an object or system.

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## Physical Science

**P1: Students demonstrate understanding that position and motion of objects can be observed, described, and measured.**

3.P1.a	Explain that changes in speed or direction of motion can be caused by forces.
3.P1.b	Know that the greater the force, the greater the change in motion.
3.P1.c	Describe and compare how objects fall according to size and weight.

**P2: Students demonstrate understanding that all objects and substances in the world are made of matter and have observable properties.**

3.P2.a	Explain how properties of substances and objects can be changed by temperature.
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**P3: Students demonstrate an understanding of the different forms and transformations of energy and the significance of energy in understanding matter.**

3.P3.a	Explain how the Sun is the Earth's main source of energy.
3.P3.b	Investigate heat production and the effects of heating and cooling on objects.
3.P3.c	Identify basic forms of energy (light, heat, sound, electrical, mechanical).

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3.P3.d	Know that motion or change can be caused by energy.
3.P3.e	Explain that heat is produced by rubbing objects together.

**P4: Students demonstrate an understanding of light and sound.**

3.P4.a	Identify simple properties of light (color, brightness, reflection).
3.P4.b	Know that light can be reflected, refracted, and absorbed.
3.P4.c	Explain that light travels in a straight line until it strikes an object or travels from one medium to another.
3.P4.d	Explain that objects that give off light also give off heat.
3.P5.e	Describe how sound travels through solids, liquids, and gases.

## Earth Science

**E1: Students demonstrate an understanding of how climate, weather and the water cycle influence and are influenced by key features of the Earth and sky.**

3.E1.a	Explain that the Sun is the major source of energy for the Earth.
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3.E1.b	Explain the water cycle in simple terms.
3.E1.c	Explain the role of the Sun in the processes of the water cycle.
3.E1.d	Describe the role of water in weather phenomena (snowstorms, floods, droughts).
3.E1.e	Know that air is a substance that surrounds us, takes up space, and moves around us as wind.
3.E1.f	Describe the length of the day and night in relation to the change in seasons.
3.E1.g	Demonstrate the revolution of the Earth around the Sun and the tilt of the Earth to explain seasons.
3.E1.h	Compare and describe changing patterns in nature that repeat themselves, such as weather conditions day-to-day and season to season.
3.E1.i	Explain what happens when cold and hot air meet.
3.E1.j	Explain the role of the ocean in the water cycle and its connection to the Earth's water reservoirs through evaporation and precipitation.
3.E1.k	Recognize how air temperature, barometric pressure, humidity, wind speed and direction, and precipitation determine weather.
3.E1.l	Distinguish among the various forms of precipitation (rain snow, sleet, hail).
3.E1.m	Contrast weather found in different environments (deserts, mountains, rainforests).

**E2: Students demonstrate understanding that there are many components of the universe.**

3.E2.a	Describe various objects in the sky, and know that there are more stars than can be seen.
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3.E2.b	Know that the solar system includes planets, moons, and the Sun.
3.E2.c	Know that the Sun is in the center of the solar system.
3.E2.d	Know that the Sun is a star.
3.E2.e	Describe the day/night cycle and the rotation of the Earth on its axis every 24 hours.
3.E2.f	Describe the physical attributes of stars.
3.E2.g	Investigate the position of the Sun in relation to a fixed object on Earth at various times of the day.
3.E2.h	Explain the change in shape of the moon over a period of time.
3.E2.i	Explain that the Sun appears larger and brighter because it is the Earth's closest star.
3.E2.j	Recognize the force of gravity and that gravity can be overcome.
3.E2.k	Recognize created order in the universe.

## Life Science

**L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

3.L1.a	Classify organisms as either plants or animals and understand that some organisms cannot be classified as either.
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3.L1.b	Identify variations within a population.
3.L1.c	Recognize beauty and variety in the creations of God.

**L2: Students demonstrate understanding that living things have identifiable characteristics.**

3.L2.a	Identify traits that are learned and traits that are inherited.
3.L2.b	Classify organisms according to their observable characteristics.

**L3: Students demonstrate an understanding of how and why organisms are dependent on one another and their environment.**

3.L3.a	Describe different habitats.
3.L3.b	Describe examples of relationships among organisms (competitive and mutually beneficial).
3.L3.c	Explain why different kinds of plants and animals live in different places.
3.L3.d	Identify the Sun as the source of food energy for various living organisms.
3.L3.e	Identify different types of habitats and the organisms that live in those habitats.
3.L3.f	Explain what will happen to an organism if its habitat is changed.
3.L3.g	Explain how some organisms interact with other organisms and with the non-living parts of its habitat.

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3.L3.h	Identify and describe the characteristics of a habitat.
3.L3.i	Recognize that all organisms can cause changes in their environments.
3.L3.j	Describe how changing seasons affect plants and animals.
3.L3.k	Know that animals may use plants or even other animals for shelter and nesting.
3.L3.l	Describe human family and community structure, different roles within that structure, and human dependency on others for various needs.
3.L3.m	Explain why human babies and many other animal babies are unable to care for themselves and how they depend on the care of other people and animals for survival.
3.L3.n	Identify ways that humans and animals learn from each other.

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### Grade 4

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

4.N1.a	Keep accurate records of scientific investigations.
4.N1.b	Distinguish observation from speculation.
4.N1.c	Know that similar scientific investigations seldom produce exactly the same results.
4.N1.d	Raise questions about the natural world and conduct individual and group investigations.

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4.N1.e	Know that scientific progress is made by conducting careful investigations, recording accurate data, and communicating the results.
4.N1.f	Recognize the design of God in creation.

**N2: Students design and conduct scientific activities.**

4.N2.a	Know the importance of and practice safety procedures in scientific activities.
4.N2.b	Choose appropriate materials for simple constructions and repairs.
4.N2.c	Use cameras, recorders, and computers to gather information.
4.N2.d	Observe how parts influence one another in things with many parts.
4.N2.e	Locate scientific information in books, newspapers, magazines, CD-ROMs, and computer databases.
4.N2.f	Know that there are different forms of scientific investigation (observing, collecting, experimenting).
4.N2.g	Keep accurate records that describe observation and distinguish between observations and inferences.

**N3: Students clearly communicate scientific ideas and activities.**

4.N3.a	Offer reasons for findings and consider reasons suggested by other.
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4.N3.b	Use records, tables, or graphs to identify patterns of change.
4.N3.c	Write instructions that others can follow.
4.N3.d	Draw sketches or make models to assist in explaining procedures or ideas.
4.N3.e	Use numerical data to describe and compare procedures or ideas.
4.N3.f	Support statements with facts found in different sources such as books, articles, and databases.
4.N3.g	Identify when results may be affected by change in conditions.
4.N3.h	Know that clear communication is an essential part of science.
4.N3.i	Attempt reasonable answers to scientific questions and cite evidence in support.

## Physical Science

**P1: Students demonstrate understanding that all objects and substances in the world are made of matter and have observable properties.**

4.P1.a	Identify materials that are transparent, opaque, and translucent.
4.P1.b	Know that matter exists in different states (solid, liquid, gas) which have distinct physical properties.

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4.P1.c	Know that heating and cooling can change some materials from one state to another.
4.P1.d	Classify materials using multiple observable physical or chemical properties.
4.P1.e	Identify mixtures that have physical properties different from the original materials used to create the mixture.
4.P1.f	Know that the mass of a substance or object is always the same as the sum of the masses of its parts.
4.P1.g	Know that all materials are composed of smaller parts that can only be seen with magnification.
4.P1.h	Know that matter has two fundamental properties (matter takes up space, matter has mass).
4.P1.i	Identify common changes in materials that result in other materials with different characteristics (rusting, burning, cooking).
4.P1.j	Investigate and explain the difference between physical change and chemical change.
4.P1.k	Investigate and describe the properties of a substance before, during, and after a chemical change.
4.P1.l	Explain that mixtures of solids can be separated based on observable properties of their parts (particle size, shape, color, magnetic attraction).

**P2: Students demonstrate an understanding of the different forms and transformations of energy and the significance of energy in understanding matter.**

4.P2.a	Explain that some substances are good conductors of heat and other substances are not.
4.P2.b	Describe how air and water are used in most industry.

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4.P2.c	Describe various means of energy conservation.
4.P2.d	Observe and describe basic forms of energy (light, heat, sound, electrical, energy of motion).
4.P2.e	Recognize that the flow of heat from a hot object to a cold object may cause materials to change temperature.
4.P2.f	Identify common materials that conduct heat.

**P3: Students demonstrate an understanding of light and sound.**

4.P3.a	Know the wave characteristics of sound.
4.P3.b	Investigate light reflection using a mirror and a light source.

## Earth Science

**E1: Students demonstrate an understanding of the composition and structure of the Earth.**

4.E1.a	Explain that most of the Earth's surface is covered with fresh or salt water.
4.E1.b	Describe the composition of rocks and the rock cycle.

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4.E1.c	Describe fossil formation.
4.E1.d	Identify the three categories of rocks (igneous, sedimentary, metamorphic).
4.E1.e	Identify the physical properties of common earth-forming minerals, and recognize the role of minerals in the formation of rocks.
4.E1.f	Recognize common renewable and nonrenewable resources of the Earth.
4.E1.g	Explain that rock is composed of various combinations of minerals.
4.E1.h	Compare properties of soils from different locations.

**E2: Students demonstrate understanding that features of the Earth's surface are constantly changing.**

4.E2.a	Explain the effects of volcanic eruptions and earthquakes on the Earth.
4.E2.b	Know that the rate of change of the Earth's surface can be abrupt (earthquake) or very slow (wearing down of a mountain).
4.E2.c	Explain how wind and water shape the Earth's surface.
4.E2.d	Explain the difference between physical weathering and erosion.
4.E2.e	Describe how water, wind, and ice change the Earth's surface by eroding rock and soil and depositing them in other places.

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4.E2.f	Explain the movement of ocean waters and their interactions with land.
4.E2.g	Explain how soils are formed through decomposition and weathering.
4.E2.h	Identify surface features caused by constructive processes (volcanoes, faults, sand dunes, etc.).
4.E2.i	Identify surface features caused by destructive processes (erosion, weathering, earthquake, volcano, organisms).

## Life Science

**L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

4.L1.a	Identify the cell as the fundamental unit of living organisms and recognize that some organisms are unicellular, while others are multicellular.
4.L1.b	Identify plants that have seeds and describe the makeup of seeds.
4.L1.c	Identify organisms that are classified as neither plant nor animal.
4.L1.d	Define and identify examples of herbivores, carnivores, and omnivores.
4.L1.e	Recognize the beauty and variety in the creations of God.

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**L2: Students demonstrate understanding that living things have identifiable characteristics.**

4.L2.a	Identify features of organisms that help them to survive (camouflage, protection, hibernation).
4.L2.b	Identify factors that may have led to the extinction of some organisms.
4.L2.c	Identify the parts of plant and animal cells and determine the function of the parts.
4.L2.d	Compare living organisms to fossils according to their similarities and differences.
4.L2.e	Describe why an organism is classified as an animal or a plant, and explain why some organisms cannot be classified as either plants or animals.
4.L2.f	Demonstrate how animals are sorted into groups and how vertebrates are sorted into groups.
4.L2.g	Demonstrate how plants are sorted into groups.

**L3: Students demonstrate an understanding of how and why organisms are dependent on one another and their environment.**

4.L3.a	Describe reproduction, seed dispersal, germination, and growth in plants.
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**L4: Students demonstrate an understanding of the organization and development of living organisms.**

4.L4.a	Identify the systems in the human body and describe their functions, including skeleton and muscles, respiratory and circulatory, and nervous and digestive.
4.L4.b	Compare and contrast the function of organs and other physical structures of plants and animals (skeletons, exoskeletons, and stems for support).
4.L4.c	Know the levels of organization in living organisms, including cells, tissues, organs, and organ systems.
4.L4.d	Know that cells continually divide to make more cells for growth and repair.
4.L4.e	Know that plants and animals have structures that enable them to grow, reproduce, and survive.
4.L4.f	Compare and contrast life cycles of plants and animals.
4.L4.g	Recognize the source of life as creative and intentional.

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## ICS Elementary Science Standards

The documents used in drafting these science standards include the Georgia Department of Education Science Standards, American Education Reaches Out (AERO), the Florida Department of Education 2008 Science Standards, and the Nevada Department of Education Science Standards.

### Grade 5

#### Nature of Science

**N1: Students demonstrate an understanding of the importance of curiosity, honesty, open-mindedness, and skepticism in the active process of systematically examining the natural world.**

5.N1.a	Explain the need for repeated experimental trials.
5.N1.b	Identify a control group and explain why a control group is needed in an experiment.
5.N1.c	Distinguish observations from ideas.

5.N1.d	Recognize that scientific investigations seldom produce exactly the same results.
5.N1.e	Question scientific claims based on vague attributions.
5.N1.f	Recognize the design of God in creation.

**N2: Students design and conduct scientific activities.**

5.N2.a	Define a problem and use appropriate reference material and tools to plan and carry out scientific investigation.
5.N2.b	Keep accurate records of investigations.
5.N2.c	Use appropriate materials for making mechanical constructions and repair.
5.N2.d	Exercise safety in measuring and mixing dry and liquid materials.
5.N2.e	Locate scientific information in books, newspapers, magazines, CD-ROM, and computer databases.
5.N2.f	Identify patterns of change.
5.N2.g	Identify possible values, least and greatest, in certain conditions.

**N3: Students clearly communicate scientific ideas and activities.**

5.N3.a	Know that explanation must be linked to evidence.
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5.N3.b	Write instructions that others can follow in carrying out a scientific procedure.
5.N3.c	Create sketches to assist in explanation of scientific procedure or ideas.
5.N3.d	Use data to describe and compare objects.
5.N3.e	Support statements with facts.
5.N3.f	Identify when different conditions have altered results.
5.N3.g	Know how to draw conclusions from scientific evidence.

## Physical Science

**P1: Students demonstrate understanding that position and motion of objects can be observed, described, and measured.**

5.P1.a	Explain that the greater the force, the greater the change in motion, for a given mass, and that a given force will have less effect on more massive objects.
5.P1.b	Know why material that has been electrically charged pushes or pulls other charged materials.
5.P1.c	Explain how magnets and electrical currents can exert force on each other.
5.P1.d	Demonstrate the effect of gravitational force on motion.

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5.P1.e	Know that energy has the ability to cause motion or change.
5.P1.f	Identify forces that cause movement (pushes, pulls, gravity).
5.P1.g	Investigate balanced forces that prevent movement when force is applied.
5.P1.h	Recognize that motion of objects can be changed by forces.

**P2: Students demonstrate an understanding of the different forms and transformations of energy and the significance of energy in understanding matter.**

5.P2.a	Explain the relationship of the Sun and fossil fuels.
5.P2.b	Describe basic forms of energy (light, heat, sound, electrical, chemical, mechanical).
5.P2.c	Explain the transformation of electrical energy into heat, light, sound energy, and energy of motion.
5.P2.d	Illustrate the requirement of a closed circuit (complete loop) for the flow of energy.
5.P2.e	Classify materials that are electrical conductors and materials that are not.
5.P2.f	Investigate static electricity.
5.P2.g	Explain how moving water and air are sources of energy.

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**P3: Students demonstrate an understanding of light and sound.**

5.P3.a	Demonstrate how vibrating objects produce sound and how altering the rate of vibration can change sound.
5.P3.b	Identify simple properties of light (color, brightness, reflection).
5.P3.c	Know that light can be reflected, refracted, and absorbed.
5. P3.d	Explain that light travels in a straight line until it strikes an object or travels from one medium to another.
5.P3.e	Explain that objects that give off light also give off heat.
5.P3.f	Know the wave characteristics of sound.

**Earth Science**

**E1: Students demonstrate understanding that there are many components of the universe.**

5.E1.a	Describe the stability and movement of stars, the seasonal appearance of stars, and the relative movement of planets.
5.E1.b	Explain the importance of the Sun and the relative size and order of the planets in our solar system.
5.E1.c	Compare and contrast physical appearance of stars, star patterns, and planets.
5.E1.d	Explain the rotation of the Earth and the day-and-night cycle.

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5.E1.e	Explain the day/night cycle of the Earth.
5.E1.f	Describe the phases of the Moon.
5.E1.g	Recognize that a galaxy consists of gas, dust, stars, objects orbiting stars, and planets. Know that our galaxy is the Milky Way.
5.E1.h	Identify the common characteristics of planets.
5.E1.i	Identify the objects in the solar system (Sun, moons, planets, asteroids, comets).
5.E1.j	Compare and contrast the characteristics of the Sun to those of other stars.
5.E1.k	Recognize created order in the universe.

## Life Science

**L1: Students demonstrate understanding that there are many kinds of living things on Earth.**

5.L1.a	Identify and explain the roles of producers, consumers, and decomposers.
5.L1.b	Recognize beauty and variety in the creations of God.

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**L3: Students demonstrate an understanding of how and why organisms are dependent on one another and their environment.**

5.L3.a	Describe the effects of habitat changes on an organism.
5.L3.b	Describe the response of plants to changing environmental conditions (light, water, space, etc.).
5.L3.c	Describe physical and behavioral adaptations to changes in an organism's environment.
5.L3.d	Explain why some organisms survive changes and others do not.
5.L3.e	Identify kinds and causes of environmental pollution, and describe the impact of pollution on living organisms and the environment.
5.L3.f	Suggest methods of reducing or controlling pollution.
5.L3.g	Explain ways humans can affect ecosystems.
5.L3.h	Demonstrate the flow of energy through a food chain beginning with sunlight and including producers, consumers, and decomposers.
5.L3.i	Predict effects on a community of organisms created by change in the environment.
5.L3.j	Explain how organisms interact with each other and with the non-living parts of their ecosystem.
5.L3.k	Explain the processes of the water cycle and how the water cycle affects an ecosystem.
5.L3.l	Identify the characteristics of an ecosystem and different kinds of ecosystems.

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