



Addlestone Hebrew Academy Science Standards

Kindergarten

Characteristics of Organisms

Standard: The student will demonstrate an understanding of the characteristics of organisms. (Life Science)

Indicators:

- Recognize what organisms need to stay alive (including air, water, food, and shelter).
- Identify examples of organisms and nonliving things.
- Match parents with their offspring to show that plants and animals closely resemble their parents.
- Compare individual examples of a particular type of plant or animal to determine that there are differences among individuals.
- Recognize that all organisms go through stages of growth and change called life cycles.

My Body

Standard: The student will demonstrate an understanding of the distinct structures of human body and the different functions they serve. (Life Science)

Indicators:

- Identify the distinct structures in the human body that are for walking, holding, touching, seeing, smelling, hearing, talking, and tasting.
- Identify the functions of the sensory organs (including the eyes, nose, ears, tongue, and skin).

Seasonal Changes

Standard: The student will demonstrate an understanding of seasonal weather changes. (Earth Science)

First Grade

The Sun and Moon

Standard: The student will demonstrate an understanding of the features of the sky and the patterns of the Sun and the Moon. (Earth Science)

Indicators:

- Compare the features of the day and night sky.
- Recall that the Sun is a source of heat and light for Earth.
- Recognize that the Sun and the Moon appear to rise and set.
- Illustrate changes in the Moon's appearance (including patterns over time).

Plants

Standard: The student will demonstrate an understanding of the special characteristics and needs of plants that allow them to survive in their own distinct environments. (Life Science)

Indicators:

- Recall the basic needs of plants (including air, water, nutrients, space, and light) for energy and growth.
- Illustrate the major structures of plants (including stems, roots, leaves, flowers, fruits, and seeds).
- Classify plants according to their characteristics (including what specific type of environment they live in, whether they have edible parts, and what particular kinds of physical traits they have).
- Summarize the life cycle of plants (including germination, growth, and the production of flowers and seeds).
- Explain how distinct environments throughout the world support the life of different types of plants.

Second Grade

Properties and Changes in Matter

Standard: The student will demonstrate an understanding of properties of matter and the changes that matter undergoes. (Physical Science)

Indicators:

- Recall the properties of solids and liquids.
- Exemplify matter that changes from a solid to a liquid and from a liquid to a solid.
- Explain how matter can be changed in ways such as heating or cooling, cutting or tearing, bending or stretching.
- Recognize that different materials can be mixed together and then separated again.

Magnetism

Standard: The student will demonstrate an understanding of force of motion by applying the properties of magnetism. (Physical Science)

Indicators:

- Use magnets to make an object move without being touched.
- Explain how the poles of magnets affect each other (that is, they attract and repel one another).
- Compare the effect of magnets on various materials.
- Identify everyday uses of magnets.

Animals

Standard: The student will demonstrate an understanding of the needs and characteristics of animals as they interact in their own distinct environments. (Life Science)

Indicators:



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Kindergarten

Indicators:

- Identify weather changes that occur from day to day.
- Compare the weather patterns that occur from season to season.
- Summarize ways that the seasons affect plants and animals.

Exploring Matter

Standard: The student will demonstrate an understanding that objects can be described by their observable properties. (Physical Science)

Indicators:

- Classify objects by observable properties (including size, color, shape, magnetic attraction, heaviness, texture, and the ability to float in water).
- Compare properties of different types of materials (including wood, plastic, metal, cloth, and paper) from which objects are made.

First Grade

- Identify characteristics of plants (including types of stems, roots, leaves, flowers, and seeds) that help them survive in their own distinct environments.

Properties of Water

Indicators:

- Recognize the observable properties of water (including the fact that it takes the shape of its container, flows downhill, and feels wet).
- Illustrate the locations of water on Earth by using drawings, maps, or models.
- Exemplify Earth materials that are used for building structures or for growing plants.

Animal Habitats

Standard: The student will demonstrate an understanding of the needs and characteristics of animals as they interact in their own distinct environments. (Life Science)

Indicators:

- Recall the basic needs of animals (including air, water, food, and shelter) for energy, growth, and protection.
- Classify animals (including mammals, birds, amphibians, reptiles, fish, and insects) according to their physical characteristics.
- Explain how distinct environments throughout the world support the life of different types of animals.
- Summarize the interdependence between animals and plants as sources of food and shelter.
- Illustrate the various life cycles of animals (including birth and the stages of development).

Second Grade

- Recall the basic needs of animals (including air, water, food, and shelter) for energy, growth, and protection.

Habitats and Adaptations

Standard: The student will demonstrate an understanding of the structures, characteristics, and adaptations of organisms that allow them to function and survive within their habitats. (Life Science)

Indicators:

- Illustrate the life cycles of seed plants and various animals and summarize how they grow and are adapted to conditions within their habitats.
- Explain how physical and behavioral adaptations allow organisms to survive (including hibernation, defense, locomotion, movement, food obtainment, and camouflage for animals and seed dispersal, color, and response to light for plants).
- Recall the characteristics of an organism's habitat that allow the organism to survive there.
- Explain how changes in the habitats of plants and animals affect their survival.
- Summarize the organization of simple food chains (including the roles of producers, consumers, and decomposers).

Weather

Standard: The student will demonstrate an understanding of daily and seasonal weather conditions. (Earth Science)

Indicators:

- Explain the effects of moving air as it interacts with objects.



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Kindergarten

First Grade

Weather

Standard: The student will demonstrate an understanding of daily and seasonal weather conditions. (Earth Science)

Indicators:

- Explain the effects of moving air as it interacts with objects.
- Recall weather terminology (including temperature, wind direction, wind speed, and precipitation as rain, snow, sleet, and hail).
 - Illustrate the weather conditions of different seasons.
- Carry out procedures to measure and record daily weather conditions (including temperature, precipitation amounts, wind speed as measured with a windsock or wind vane).
- Use pictorial weather symbols to record observable sky conditions.
- Identify safety precautions that one should take during severe weather conditions.

Second Grade

- Recall weather terminology (including temperature, wind direction, wind speed, and precipitation as rain, snow, sleet, and hail).
- Carry out procedures to measure and record daily weather conditions (including temperature, precipitation amounts, wind speed as measured on the Beaufort scale, and wind direction as measured with a windsock or wind vane).
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First Grade

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Plants

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Indicators:

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- Classify plants according to their characteristics (including what specific type of environment they live in, whether they have edible parts, and what particular kinds of physical traits they have).
- Summarize the life cycle of plants (including germination, growth, and the production of flowers and seeds).
- Explain how distinct environments throughout the world support the life of different types of plants.

Second Grade

Properties and Changes in Matter

Standard: The student will demonstrate an understanding of properties of matter and the changes that matter undergoes. (Physical Science)

Indicators:

- Recall the properties of solids and liquids.
- Exemplify matter that changes from a solid to a liquid and from a liquid to a solid.
- Explain how matter can be changed in ways such as heating or cooling, cutting or tearing, bending or stretching.
- Recognize that different materials can be mixed together and then separated again.

Magnetism

Standard: The student will demonstrate an understanding of force of motion by applying the properties of magnetism. (Physical Science)

Indicators:

- Use magnets to make an object move without being touched.
- Explain how the poles of magnets affect each other (that is, they attract and repel one another).
- Compare the effect of magnets on various materials.
- Identify everyday uses of magnets.

Animals

Standard: The student will demonstrate an understanding of the needs and characteristics of animals as they interact in their own distinct environments. (Life Science)

Indicators:

Third Grade

Earth's Materials and Changes

Standard: The student will demonstrate an understanding of Earth's composition and the changes that occur to the features of Earth's surface. (Earth Science)

Indicators:

- Classify rocks (including sedimentary, igneous, and metamorphic) and soils (including humus, clay, sand, and silt) on the basis of their properties.
- Identify common minerals on the basis of their properties by using a minerals identification key.
- Recognize types of fossils (including molds, casts, and preserved parts of plants and animals).
- Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago.
- Illustrate Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
- Illustrate Earth's land features (including volcanoes, mountains, valleys, canyons, caverns, and islands) by using models, pictures, diagrams, and maps.
- Exemplify Earth materials that are used as fuel, as a resource for building materials, and as a medium for growing plants.
- Illustrate changes in Earth's surface that are due to slow processes (including weathering, erosion, and deposition) and changes that are due to rapid processes (like landslides, volcanic eruptions, floods,



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Weather

Standard: The student will demonstrate an understanding of daily and seasonal weather conditions. (Earth Science)

Indicators:

- Explain the effects of moving air as it interacts with objects.

Third Grade

Heat

Standard: The student will demonstrate an understanding of changes in matter that are caused by heat.

Indicators:

- Classify different forms of matter (including solids, liquids, and gases) according to their observable and measurable properties.
- Explain how water and other substances change from one state to another (including melting, freezing, condensing, boiling, and evaporating).
- Explain how heat moves easily from one object to another through direct contact in some materials (called conductors) and not so easily through other materials (called insulators).
- Identify sources of heat and exemplify ways that heat can be produced (including rubbing, burning, and using electricity).

Motion and Sound

Standard: The student will demonstrate an understanding of how motion and sound are affected by a push or pull on an object and the vibration of an object. (Physical Science)

Indicators:

- Identify the position of an object relative to a reference point by using position terms such as "above," "below," "inside of," "underneath," or "on top of" and a distance scale or measurement.
- Compare the motion of common objects in terms of speed and direction.
- Explain how the motion of an object is affected by the strength of a push or pull of gravity.



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Third Grade

- Explain the relationship between the motion of an object and the pull of gravity.
- Recall that vibrating objects produce sound and that vibrations can be transferred from one material to another.
- Compare the pitch and volume of different sounds.
- Recognize ways to change the volume of sounds.
- Explain how the vibration of an object affects pitch.



Addlestone Hebrew Academy Science Standards

Second Grade

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Indicators:

Fourth Grade

Life Science

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- Classify organisms into major groups (including plants or animals) flowering or nonflowering plants, and vertebrates or invertebrates) according to their physical characteristics.
 - Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.
 - Distinguish between the characteristics of an organism that are inherited and those that are acquired over time.
- Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).
 - Explain how organisms cause change in their environment.

Physical Science

- Explain how different media (solids, liquids, gases) will affect the transmission of sound.
- Explain why sound waves travel only where there is matter to transmit them.
 - Explain the relationship between frequency and pitch.
 - Interpret a model or diagram of a compression wave.
- Design an investigation to determine what factors affect pitch of a vibrating object.



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- Compare the motion of common objects in terms of speed and direction.
- Explain how the motion of an object is affected by the strength of a push or pull of gravity.

Fourth Grade

- Summarize the basic properties of light.
- Illustrate the fact that light, as a form of energy, is made up of many different colors.
- Summarize how light travels and explain what happens when it strikes an object (including reflection, refraction, and absorption).
- Compare how light behaves when it strikes transparent, translucent, and opaque materials.



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Second Grade

- Recall weather terminology (including temperature, wind direction, wind speed, and precipitation as rain, snow, sleet, and hail).
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Third Grade

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- Compare the pitch and volume of different sounds.
- Recognize ways to change the volume of sounds.
- Explain how the vibration of an object affects pitch.

Fourth Grade



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- Illustrate Earth's saltwater and freshwater features (including oceans, seas, rivers, lakes, ponds, streams, and glaciers).
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Indicators:

Fourth Grade

Life Science

- Understand the processes of scientific inquiry to conduct a simple scientific investigation.
- Classify organisms into major groups (including plants or animals) flowering or nonflowering plants, and vertebrates or invertebrates) according to their physical characteristics.
- Explain how the characteristics of distinct environments (including swamps, rivers and streams, tropical rain forests, deserts, and the polar regions) influence the variety of organisms in each.
- Distinguish between the characteristics of an organism that are inherited and those that are acquired over time.
- Explain how an organism's patterns of behavior are related to its environment (including the kinds and the number of other organisms present, the availability of food and other resources, and the physical characteristics of the environment).
- Explain how organisms cause change in their environment.

Physical Science

- Explain how different media (solids, liquids, gases) will affect the transmission of sound.
- Explain why sound waves travel only where there is matter to transmit them.
- Explain the relationship between frequency and pitch.
- Interpret a model or diagram of a compression wave.
- Design an investigation to determine what factors affect pitch of a vibrating object.

Fifth Grade

Life Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Observe and describe the structures found in plant and animal cells and explain their functions.
- Understand the role of organ systems in transporting materials throughout the body.
- Explain how different organ systems work together.
- Understand the importance of classification and describe the major kingdoms of life.
- Describe the role of mitosis and meiosis in animal growth.
- Identify traits that animal young and plants inherit from their parents.
- Describe the two main groups of plants.
- Describe the function of plant structures.
- Identify the significance of water, carbon-oxygen, and nitrogen cycles.
- Describe the interactions that occur within an ecosystem.
- Identify characteristics of each of the six major land biomes in North America.
- Describe three types of water ecosystems.

Earth Science

- Observe and describe properties of minerals.
- Differentiate between different kinds of rocks and explain how they form.
- Measure local weather conditions using a weather station.
- Identify the causes of weather and what determines a climate.



Addlestone Hebrew Academy Science Standards

Third Grade

Heat

Standard: The student will demonstrate an understanding of changes in matter that are caused by heat.

Indicators:

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Fourth Grade

- Summarize the basic properties of light.
- Illustrate the fact that light, as a form of energy, is made up of many different colors.
- Summarize how light travels and explain what happens when it strikes an object (including reflection, refraction, and absorption).
- Compare how light behaves when it strikes transparent, translucent, and opaque materials.

Fifth Grade

- Illustrate the features of the ocean floor.
- Recognize the similarities and differences of Earth and the moon.
- Identify Earth's daily and seasonal cycles in relation to the sun.
- Recognize the equipment used by scientists and astronauts to explore our solar system.

Physical Science

- Explore matter and its properties.
- Identify an atom and its major parts.
- Recognize how the elements are grouped in the periodic table.
- Describe the different kinds of forces and what they do.
- Explain how work and power are measured.
- Understand how speed, velocity, acceleration, and momentum are related and measured.
- Describe the different forms of energy.



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Third Grade

- Explain the relationship between the motion of an object and the pull of gravity.
- Recall that vibrating objects produce sound and that vibrations can be transferred from one material to another.
- Compare the pitch and volume of different sounds.
- Recognize ways to change the volume of sounds.
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Earth Science

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- Differentiate between different kinds of rocks and explain how they form.
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- Identify the causes of weather and what determines a climate.

Sixth Grade

Earth Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Recognize the major branches of Earth Science.
- Demonstrate and explain how a magnetic compass can be used to find directions on Earth.
- Distinguish between lines of latitude and lines of longitude.
 - Compare the three types of map projections.
 - Explain the major characteristics of minerals.
 - Classify minerals using common mineral-identification techniques.
 - Describe how each type of rock changes into another as it moves through the rock cycle.
- Contrast renewable resources with nonrenewable resources.
- Describe how different types of fossils are formed.
- Demonstrate an understanding of the geologic time scale.
 - Illustrate the structure of the Earth.
- Understand the processes that have altered Earth's structure over time.
 - Explain the characteristics and impact of earthquakes and volcanoes on Earth.
 - Illustrate the features of the ocean floor.
- Understand the characteristics, structure, and predictable motions of celestial bodies.



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Sixth Grade



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Fifth Grade

Life Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Observe and describe the structures found in plant and animal cells and explain their functions.
 - Understand the role of organ systems in transporting materials throughout the body.
- Explain how different organ systems work together.
 - Understand the importance of classification and describe the major kingdoms of life.
 - Describe the role of mitosis and meiosis in animal growth.
 - Identify traits that animal young and plants inherit from their parents.
 - Describe the two main groups of plants.
 - Describe the function of plant structures.
 - Identify the significance of water, carbon-oxygen, and nitrogen cycles.
 - Describe the interactions that occur within an ecosystem.
- Identify characteristics of each of the six major land biomes in North America.
 - Describe three types of water ecosystems.

Earth Science

- Observe and describe properties of minerals.
- Differentiate between different kinds of rocks and explain how they form.
- Measure local weather conditions using a weather station.
- Identify the causes of weather and what determines a climate.

Sixth Grade

Earth Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Recognize the major branches of Earth Science.
- Demonstrate and explain how a magnetic compass can be used to find directions on Earth.
- Distinguish between lines of latitude and lines of longitude.
 - Compare the three types of map projections.
 - Explain the major characteristics of minerals.
 - Classify minerals using common mineral-identification techniques.
 - Describe how each type of rock changes into another as it moves through the rock cycle.
- Contrast renewable resources with nonrenewable resources.
- Describe how different types of fossils are formed.
- Demonstrate an understanding of the geologic time scale.
 - Illustrate the structure of the Earth.
- Understand the processes that have altered Earth's structure over time.
 - Explain the characteristics and impact of earthquakes and volcanoes on Earth.
 - Illustrate the features of the ocean floor.
- Understand the characteristics, structure, and predictable motions of celestial bodies.

Seventh Grade

Life Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Know the levels of organization to explain the nature of structure and function among living organisms.
- Compare the major components of plant and animal cells.
 - Compare passive and active transport within cells.
 - Describe the processes of photosynthesis, cellular respiration, and fermentation.
- Explain the difference between mitosis and meiosis.
 - Use Punnett squares to predict inherited monohybrid traits.
- Describe the basic structure of the DNA molecule.
- Summarize the processes of DNA replication and protein synthesis.
- Explain how fossils are important to Darwin's theory of evolution.
 - Describe the geologic time scale and the information it provides to scientists.
- Explain the differences between hominid groups.
- Compare the body shapes of bacteria and viruses.
- Understand the major structures, processes, and responses of plants that aid in their survival.
 - Compare the characteristic structures of invertebrate animals and vertebrate animals.
- Classify various groups of organisms using the seven major levels of classification.
 - Compare the responses of endotherms to ectotherms to changes in the environmental temperature.



Addlestone Hebrew Academy Science Standards

Fifth Grade

- Illustrate the features of the ocean floor.
- Recognize the similarities and differences of Earth and the moon.
- Identify Earth's daily and seasonal cycles in relation to the sun.
- Recognize the equipment used by scientists and astronauts to explore our solar system.

Physical Science

- Explore matter and its properties.
- Identify an atom and its major parts.
- Recognize how the elements are grouped in the periodic table.
- Describe the different kinds of forces and what they do.
 - Explain how work and power are measured.
- Understand how speed, velocity, acceleration, and momentum are related and measured.
 - Describe the different forms of energy.

Sixth Grade

Seventh Grade

- Summarize the relationships of the major organ systems; circulatory, respiratory, digestive, excretory, nervous, muscular, and skeletal systems.



Addlestone Hebrew Academy Science Standards

Sixth Grade

Earth Science

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Eighth Grade

Physical Science

- Understand the processes of scientific inquiry to investigate questions and conduct laboratory experiments.
- Compare physical and chemical properties of matter.
- Describe the differences between the four, major states of matter.
- Use Boyle's and Charles's Laws to predict how a change in pressure or temperature will affect the volume of a gas.
- Describe how substances change from one state to another.
- Identify the difference between an element and a compound.
 - Describe the properties of mixtures and the methods used to separate their components.
- Compare the different models of an atom and the charge, location, and relative mass of subatomic particles.
- Describe how elements are arranged in the periodic table.
- Compare the properties of metals, nonmetals, and metalloids.
 - Compare ionic, covalent, and metallic bonding.
 - Describe the properties and uses of acids and bases and identify these compounds using the pH scale.
- Describe the characteristics of carbohydrates, lipids, proteins, and nucleic acids and their functions in the body.
 - Describe the four types of chemical reactions.
- Interpret and write simple chemical formulas and balanced chemical equations.



Addlestone Hebrew Academy Science Standards

Sixth Grade

Seventh Grade

- Summarize the relationships of the major organ systems; circulatory, respiratory, digestive, excretory, nervous, muscular, and skeletal systems.

Eighth Grade

- Compare exothermic and endothermic reactions.
- Use appropriate equations to measure motions of speed, velocity, and acceleration.
 - Give examples of different kinds of forces.
- Compare the forces of friction and gravity and their effects on motion.
 - Use Bernoulli's principle to explain how fluid pressure affects the speed of a moving fluid.
- Demonstrate an understanding of the properties and behaviors of waves.