

Learning Targets – Science K4-12

For All Levels/ Areas of Science

Science Connections – Connect scientific themes to the natural and designed world using models, scientific methods, including data collection, analysis, and research.

Natural Science – Explain how scientific knowledge is attained. Describe the ethical problems that may result when doing scientific research.

Science Inquiry – Research scientific concepts. Undertake science investigations to engage students in-depth learning experiences that enable them to develop a deeper understanding of the ideas of science and ability to apply them appropriately.

Science Application – Describe important scientific events. Identify how science has improved society. Give examples of technology and discoveries that changed our lives.

Science in Social and Personal Perspectives – Draw connections between the effects of science upon society and of society upon the natural world.

1st Grade Learning Targets

Life and Environmental Science

- Understand that living things have life cycles of birth, growth, reproduction, and death. F.4.2, F.4.3, F.4.4

Earth and Space Science

- Observe and describe changes in the Earth and sky, such as phases of the moon. E.4.4
- Identify the sun, moon, stars, and planets; for example, describe how we see them change. E.4.4

Physical Science

- Explore motion and how it is linked to the position of objects; for example, observe and record how objects move when pushed or pulled. D.4.6, D.4.7, D.4.8
- Explore light, magnetism, motion, and the properties of objects; for example, classify and compare objects that sink or float. D.4.6

2nd Grade Learning Targets

Life and Environmental Science

- Demonstrate an understanding of the characteristics and structures of living things, the processes of life, and how living things interact with one another and their environment. F.4.2, F.4.3, F.4.4

Earth and Space Science

- Explain how studying the Earth helps us know about the past; for example, by studying fossils. E.4.2, E.4.3, E.4.6
- Understand and observe how landforms are formed and broken down by water and wind over time. E.4.6

Physical Science

- Identify properties of objects such as solids dissolving in liquids. D.4.3
- Explore sound; for example, manipulate moving objects to show that vibration causes sound. D.4.7, D.4.8

3rd Grade Learning Targets

Life and Environmental Science

- Identify the characteristics of animals that are grouped; for example, group animals by characteristics such as having fur, fins, wings, or pouches. F.4.1, F.4.3, F.4.4
- Illustrate the different ways organisms grow and produce. F.4.3

Earth and Space Science

- Distinguish between natural and manufactured objects and materials. E.4.7, E.4.8
- Describe the weather in terms of clouds, temperature, humidity, and forms of precipitation, including seasonal changes. E.4.5

Physical Science

- Investigate the properties of objects and material; for example, observe that a gas takes the shape of the container it is in. D.4.3, D.4.4, D.4.5
- Investigate changes in the position and motion of objects; for example, explain what happens when a bicycle pedal is pushed. D.4.4, D.4.5, D.4.6, D.4.7

4th Grade Learning Targets

Life and Environmental Science

- Explore how plants use processes for survival such as photosynthesis. Describe ways people use plants. F.4.1, F.4.2, F.4.4
- Describe the characteristics of different ecosystems. F.4.3

Earth and Space Science

- Compare/contrast different types of rocks and minerals. Investigate the processes, such as weathering and erosion, and their effect on rocks and minerals. E.4.1, E.4.2
- Investigate different means to conserve and protect the environment and the world's natural resources. E.4.1, E.4.3
- Explain the characteristics of different bodies of water such as the Oceans. Investigate movement and locations of major bodies of water. E.4.3

Physical Science

- Explore substances that can/ cannot be touched such as forms of energy -heat, electricity, and sound. D.4.8

5th Grade Learning Targets

Life and Environmental Science

- Describe the difference between world biomes. Explain what makes each biome a unique environment for living things.
- Explore the different body systems that make up the human body. Describe the importance of the major body systems.

Earth and Space Science

- Create a model of the Solar System and use it to describe the differences between planets, and other objects in the Solar System.
- Describe how different forces of weather change the surface of the Earth.

Physical Science

- Identify different elements of nature and distinguish between the different characteristics of matter

6th Grade Learning Targets

Life and Environmental Science

- N/A

Earth and Space Science

- N/A

Physical Science

- Investigate Newton's Laws of Motion. Explain the connection between motion and the transfer of energy.
- Compare and contrast different types of energy. Explain the importance of energy on the world.
- Explain how matter changes. Describe the physical and chemical properties of matter.
- Investigate chemical reactions. Investigate how substance reaction to other substances forms new substances.
- Discuss the organization of the periodic table. Explain the basic properties of the major elements.

7th Grade Learning Targets

Life and Environmental Science

- Explain how the human and its systems work together.
- Explain the function and structure of the major body systems such as the skeletal, digestive, nervous, muscular, circulatory, and respiratory systems.
- Explore how living things (animals/plants) change to survive in different ecosystems.
- Discuss the differences between invertebrate and vertebrate. Explain how all-living things are classified.

Earth and Space Science

- N/A

Physical Science

- N/A

8th Grade Learning Targets

Life and Environmental Science

- N/A

Earth and Space Science

- Create a model of the Solar System and use it to observe differences between planets, stars, and other objects found in space.
- Explain the different cycles and the affects such as day/night and the calendar systems.
- Investigate the history of the Earth and how evidence is collected support different theories.
- Explain how the Earth has changed, such as earth's atmosphere, water supply, and weather changes over time.
- Describe Earth's forces that change the surface of the Earth such as earthquakes, volcanoes, mass movement, tornadoes, and hurricanes.
- Describe Earth's cycles such as the water cycle and rock cycle.

Physical Science

- N/A

High School Learning Targets — Science 9 and Applied Science

Life and Environmental Science

Earth and Space Science

Physical Science

Structure of Matter

- Describe atomic structure and properties of matter including atoms, elements, molecules and compounds during physical and chemical interactions (D12.1)
- Explain internal forces that hold atoms together (D12.2)
- Understand and predict patterns found in the periodic table (D12.5)

Interactions of Matter

- Explain how substances interact to form new substances using knowledge of chemical and physical properties (D12.4, D12.5)
- Specifically how temperature and energy are interrelated to the classification and interactions of matter
- Using the concept of conservation of matter, understand how substances bond and be able to identify and write equations for simple types of chemical bonds and reactions (D12.5, D12.6)

Motions and Forces

- Identify types of external and internal forces acting on a system and predict the changes in motion caused by those forces (D12.7, D12.8)
- Represent forces both algebraically and graphically and the result of internal and external forces (D12.7, D12.8)
- Understand, compare and investigate models of light, sound, electricity and magnetism to find the interconnectedness and how these forms of energy relate to each other (D12.9)

Conservation and Interactions of Energy

- Understand that interactions of matter and energy cannot create or destroy either, but can be changed into different forms and what that impact is on the physical world (D12.10, D12.11)

High School Learning Targets — Science 9 and Applied Science

Life and Environmental Science

Earth and Space Science

Energy in the Earth System

- Distinguish between internal and external energies and how these sources have impact on those systems (E12.1)

Physical Science

Structure of Matter

- Describe atomic structure and properties of matter including atoms, molecules and compounds and their physical and chemical interactions (D12.1)
- Explain internal forces that hold atoms together (D12.2)

Interactions of Matter

- Explain and show how temperature, volume and pressure are interrelated to the classification and interactions of matter (D12.4, D12.5)

Motions and Forces

- Identify types of external and internal forces acting on a system and predict the changes in motion caused by those forces (D12.7, D12.8)
- Represent forces both mathematically (algebraically and geometrically) and graphically and the result of internal and external forces (D12.7, D12.8)
- Understand the four (4) main forces of gravitation, electromagnetic and nuclear (weak and strong) and their impact on the universal system (D12.8)
- Understand and compare models of heat, light, sound, electricity and magnetism to find the interconnectedness and how they relate to work (D12.9)

Conservation and Interactions of Energy

- Understand that interactions of matter and energy cannot create or destroy either, but can be changed into different forms (D12.10)
- Use knowledge of matter and energy to explain transformations between them from either or both external and internal factors, and the affect to systems and the environment around them (D12.11, D12.12)

High School Learning Targets — Biology

Life and Environmental Science

The Cell

- Identify and evaluate characteristics of living organisms
- Understand how cell structure and function differentiate and regulate cells (F12.1, F12.2)

Molecular Basis of Heredity

- Explain the molecular and genetic basis of heredity
- State the relationship between cell growth and reproduction as it relates to genetics and heredity (C12.1, F12.3, F12.4)

Biological Evolution

- Understand biological classification (A12.3, B12.4 – 5, F12.5, F12.12)
- Investigate specimens to determine differences as it relates to form and function (specifically morecans, protests, invertebrates and vertebrates) (F12.5)
- Diseases: Genetic, Bacterial, Viral, Parasitic (Health Standards - HE: A12.3, 12.5, 12.7, 12.8, D12.6 – 7)
- Endangered Species/Invasive Species (A12.1, B12.4, B12.6, C12.2, C12.7, F12.7 – 8, G12.1, G12.5, H12.4 – 5)

Interdependence of Organisms

- Infer how diverse organisms both cooperate and compete in ecosystems including but not limited to the human world (F12.7 - 10)

Matter, Energy and Organizations of Living Systems

- Compare ways in which living things obtain energy from food, move it though their systems and eliminate waste (D12.1 – 5, F12.9, F12.10, F12.11)

Behavior of Organisms

- Understand how sensory systems help living things react and respond to their environment (F12.12)

Earth and Space Science

Physical Science

Structure of Matter

- Describe atomic structure and properties of matter including atoms, elements, molecules and compounds during physical and chemical interactions (D12.1 - 5)
- Understand and predict patterns found in the periodic table (D12.5)

Earth and Space Science

Physical Science

High School Learning Targets — Biology II

Life and Environmental Science

Biological Evolution

- Understand the evolution of plants (algae and fungi), natural selection and biological classification (F12.5)
- Using the concepts of evolution and heredity, account for changes in species and diversity using primitive plants (mosses and ferns) and seed plants (angiosperms and gymnosperms) (F12.6)

Matter, Energy and Organizations of Living Systems

- Understand how the organ systems of plants (roots, stems and leaves) and mammals (skeletal, muscular, digestive, circulatory and respiratory, urogenital and nervous) accommodate themselves to use matter and energy to sustain said organism (F12.9, F12.10, F12.13)

Behavior of Organisms

- Understand and investigate how sensory and nervous systems of mammals react and respond to their environment (F12.12)

Earth and Space Science

Physical Science

High School Learning Targets — Chemistry

Life and Environmental Science

Earth and Space Science

Physical Science

Structure of Atoms and Matter

- Understand and explain atomic structure and the properties of matter during physical and chemical interactions. (D12.1, D12.2)

Chemical Reactions

- Explain how substances react with one another to produce new substances and demonstrate the ability to represent and interpret chemical reactions through chemical equations (D12.4)
- Understand mole relationships and demonstrate the ability to use the mole and atomic mass to predict quantities of substances involved in a reaction (D12.5)
- Explain and predict patterns in chemical and physical properties as used in the periodic table of elements(D12.5)

Interactions of Matter and Energy

- Using knowledge of atomic structure and properties of atoms, molecules and compounds, explain chemical and physical changes and interactions of matter (D12.1, D12.5, D12.12)
- Using knowledge of the composition and properties of substances, explain common occurrences in the physical world. (D.12.11)

High School Learning Targets — Chemistry II

Life and Environmental Science

- Using patterns in chemical and physical properties, understand and demonstrate how energy is stored in food (plants and animals) and released to sustain organisms (F12.9, F12.11, D12.5)
- Using patterns in the exchange of mass and energy in atomic/nuclear reactions, describe affects of radioactivity on life and the environment (D12.2, D12.3, D12.5, F12.8, E12.4)

Earth and Space Science

- Analyze the benefits, costs, and limitations of past, present, and projected use of nuclear chemistry on the use of resources and technology and consequences to the environment (E12.4)

Physical Science

- Explain how simple substances interact to produce new substances and identify patterns formed in these reactions (D12.4, D12.5, D12.12)
- Using patterns in chemical reactions, predict reaction rates and reaction equilibrium to explain changes in matter (D12.5, D12.12)
- Investigate electro-chemical interactions to explain occurrences in the physical world and interactions of matter (D12.5, D12.6, D12.11, D12.12)
- Analyze and interpret the various chemical and physical properties that are unique to each different pure substance (D12.5, D12.11)