

SCIENCE – UNIFYING STANDARDS

THE NATURE OF SCIENCE

- 1.0 **Research and Investigation:** Students understand that science is a way of learning about the natural world. They use scientific inquiry and develop ideas based on data collected from investigations they design.
- 2.0 **Communication:** Students understand that the universe can be described by principles derived through scientific inquiry. They effectively communicate their understanding of ideas developed in scientific investigation through a variety of media.
- 3.0 **Connections and Implications:** Students review the consequences of the process and products of scientific inquiry. They understand the role that scientific advances have had throughout history.

EARTH SCIENCE

- 1.0 **Characteristics of the Universe:** Students understand Earth-based and space-based astronomy reveals the structure, scale, and dynamic nature of the solar system, stars, galaxies, and the universe.
- 2.0 **The Dynamic Earth:** Students understand that the Earth is constantly changing and being shaped due to a variety of natural events, processes, and human activity. The Earth is a collection of interacting cycles, structures, and processes that can be described in terms of space, time, energy, and matter.

LIFE SCIENCE

- 1.0 **Diversity and Interdependence:** Students understand that living things are diverse and interdependent. They recognize the relationship between cooperation and competition among organisms in ecosystems.
- 2.0 **Cellular Structures and Functions:** Students understand that cells are the basic structures of all living systems. They understand the complementary relationship between the structure and function of cells, organs, organ systems, whole organisms, and ecosystems.
- 3.0 **Change and Evolution:** Students understand that living things grow, develop, change, and evolve through time, depending on environmental influences. They know that traits of species can change through generations and that instruction of traits is contained in the genetic material of organisms.

PHYSICAL SCIENCE

- 1.0 **Forces and Motion:** Students understand the nature of forces and the relationship between forces and motion. They recognize that the relationship is described by one set of laws. They understand that all matter is in motion and that motion changes as a result of forces between matter. They realize that these forces affect everyday life, and that the effects can be identified, measured, and predicted.
- 2.0 **Energy, Momentum and Transformation:** Students understand that when matter interacts with matter, energy and momentum can be transferred or distributed, and that energy may be transformed. When matter interacts the total amount of matter, energy, and momentum remain the same.
- 3.0 **Structure and Properties of Matter:** Students understand that all matter is made up of particles. They understand the relationship between the structure and properties of matter. They know that a finite number of basic elements combine in various ways which determine all properties, characteristics, and behaviors of matter.

THE NATURE OF SCIENCE Level 1

1.0 Research and Investigation: Students understand that science is a way of learning about the natural world. They use scientific inquiry and develop ideas based on data collected from investigations they design.

Focus Goals

1.1 Understand the importance of questioning information in scientific investigations.

2.0 Communication: Students understand that the universe can be described by principles derived through scientific inquiry. They effectively communicate their understanding of ideas developed in scientific investigation through a variety of media.

Focus Goals

2.1 Demonstrate scientific understanding using a variety of methods.

4.0 Connections and Implications: Students review the consequences of the process and products of scientific inquiry. They understand the role that scientific advances have had throughout history.

Focus Goals

3.1 Begin to recognize how science affects daily life.

3.2 Apply Literacy skills to make scientific connections.

THE NATURE OF SCIENCE

Level 1

1.0 Research and Investigation: Students understand that science is a way of learning about the natural world. They use scientific inquiry and develop ideas based on data collected from investigations they design.

- 1.1 Begin to understand the importance of posing questions about scientific investigations.**
 θ When there are inconsistencies in descriptions of observations, make new observations. (c4e/n)

2.0 Communication: Students understand that the universe can be described by principles derived through scientific inquiry. They effectively communicate their understanding of ideas developed in scientific investigation through a variety of media.

- 2.1 Demonstrate scientific understanding using a variety of methods.**
 θ Draw pictures that illustrate features being described. (c4a/n)
 θ Record observations and data with pictures, numbers, and/or written statements. (c4b/n/p)
 θ Record observations on a bar graph. (c4c/n)
 θ Describe the relative position of objects using two references (e.g., above and next to, below and left of). (c4d/n)

3.0 Connections and Implications: Students review the consequences of the process and products of scientific inquiry. They understand the role that scientific advances have had throughout history.

- 3.1 Begin to recognize how science affects daily life.** (c)
 θ Identify examples of science in daily life at home, school, and in the community
- 3.2 Apply Literacy skills to make scientific connections.** (p – Literacy Standards)
 θ Read, view and apply informational science material. (R-2.0)
 θ Learn science vocabulary by classifying grade appropriate words. (R-1.0)
 θ Use technology and reference sources to locate information on science topics.
 (W-3.0)
 θ Write descriptions, narratives, and/or notes based on science knowledge. (W-2.0)
 θ Deliver brief narrative presentations on science topics. (L/S-3.0)

EARTH SCIENCE
Level 1

1.0 Characteristics of the Universe: Students understand Earth-based and space-based astronomy reveals the structure, scale, and dynamic nature of the solar system, stars, galaxies, and the universe.

1.0 Not addressed at this level.

2.0 The Dynamic Earth: Students understand that the Earth is constantly changing and being shaped due to a variety of natural events, processes, and human activity. The Earth is a collection of interacting cycles, structures, and processes that can be described in terms of space, time, energy, and matter.

2.1 Understand that weather is cyclical and can be observed, measured and described.

2.2 Understand that some changes on Earth are caused by weather.

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2.1 Understand that weather is cyclical and can be observed, measured and described.

θ Identify weather conditions that tend to be predictable during a season. (c3b)

θ Demonstrate how tools, such as thermometers, wind vanes, and rain gauges, can be used to measure weather conditions. (c3a/p)

2.2 Understand that some changes on Earth are caused by weather.

θ Describe how weather changes from day to day. (c3b)

θ Describe characteristics of the four seasons. (c3b)

θ Recognize that the length of the day changes with the seasons. (c3b)

θ Explain how the sun heats the land, water, and air, and how that affects the Earth. (c3c/p)

LIFE SCIENCE
Level 1

4.0 Diversity and Interdependence: Students understand that living things are diverse and interdependent. They recognize the relationship between cooperation and competition among organisms in ecosystems.

Focus Goals

1.1 Understand that plants and animals depend on each other to meet their needs in different ways.

2.0 Cellular Structures and Functions: Students understand that cells are the basic structures of all living systems. They understand the complimentary relationship between the structure and function of cells, organs, organ systems, whole organisms, and ecosystems.

Focus Goals

2.1 Understand that plants and animals develop specific structures to meet their needs.

3.0 Change and Evolution: Students understand that living things grow, develop, change, and evolve through time, depending on environmental influences. They know that traits of species can change through generations and that instruction of traits is contained in the genetic material of organisms.

Focus Goals

3.0 Not addressed at this level.

LIFE SCIENCE

Level 1

1.0 Diversity and Interdependence: Students understand that living things are diverse and interdependent. They recognize the relationship between cooperation and competition among organisms in ecosystems.

1.1 Understand that plants and animals depend on each other to meet their needs in different ways.

θ Compare and contrast how animals and plants meet their needs for food, shelter and nesting. (c2c)

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2.1 Understand that plants and animals develop specific structures to meet their needs.

θ Explain how plant structures, such as roots, stems and leaves help the plants to take in water and nutrients, and to make food from sunlight. (c2a/n)

θ Explain how animal structures, such as beaks, teeth, feet, and claws, determine the type of food the animal eats (e.g., sharp teeth: eats meat; flat teeth: eats plants). (c2a/n)

θ Explain why different plants and animals inhabit different kinds of environments and how external features help them thrive. (c2a/n)

θ Compare and contrast the needs of plants and animals for water, food, and light. (c2b/n)

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PHYSICAL SCIENCE
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Focus Goals

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2.0 Energy, Momentum and Transformation: Students understand that when matter interacts with matter, energy and momentum can be transferred or distributed, and that energy may be transformed. When matter interacts the total amount of matter, energy, and momentum remain the same.

Focus Goals

2.1 Explain and understand how properties of substances can be changed by mixing, cooling or heating.

3.0 Structure and Properties of Matter: Students understand that all matter is made up of particles. They understand the relationship between the structure and properties of matter. They know that a finite number of basic elements combine in various ways which determine all properties, characteristics, and behaviors of matter.

Focus Goals

3.1 Understand that matter can be described by properties.

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Level 1

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2.0 Energy, Momentum and Transformation: Students understand that when matter interacts with matter, energy and momentum can be transferred or distributed, and that energy may be transformed. When matter interacts the total amount of matter, energy, and momentum remain the same.

2.1 Explain and understand how properties of substances can be changed by mixing, cooling or heating.

θ Demonstrate how mixing, cooling or heating changes water and other substances. (c1b/n/p)

θ Know that changes in matter (mixing, cooling, and heating) require energy. (*)

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3.1 Understand that matter can be described by properties.

θ Describe the properties of solids, liquids, and gasses. (c1a/n)