# Science Standards 4th Grade

**3.1.4.A1** Classify plants and animals according to the physical characteristics that they share.

**3.1.4.A2** Describe the different resources that plants and animals need to live.

**3.1.4.A3** Identify differences in the **life cycles** of plants and animals.

**3.1.4.A5** Describe common functions living things share to help them function in a specific environment.

**3.1.4.A8** Construct and interpret **models** and diagrams of various animal and plant **life cycles.**

**3.1.4.A9**

- Distinguish between scientific fact and opinion.
- Ask questions about objects, organisms, and events.
- Understand that all scientific investigations involve asking and answering questions and comparing the answer with what is already known.
- Plan and conduct a simple investigation and understand that different questions require different kinds of investigations.
- Use simple equipment (tools and other technologies) to gather data and understand that this allows scientists to collect more information than relying only on their senses to gather information.
- Use data/evidence to construct explanations and understand that scientists develop explanations based on their evidence and compare them with their current scientific knowledge.
- Communicate procedures and explanations giving priority to evidence and understanding that scientists make their results public, describe their investigations so they can be reproduced, and review and ask questions about the work of other scientists.

**3.1.4.B1** Describe features that are observable in both parents and their offspring.

**3.1.4.B2** Recognize that reproduction is necessary for the continuation of life.

**3.1.4.B5** Identify observable patterns in the physical characteristics of plants or groups of animals.

**3.1.4.C1** Identify different characteristics of plants and animals that help some populations survive and reproduce in greater numbers.

Describe how environmental changes can cause **extinction** in plants and animals.

**3.1.4.C2** Describe plant and animal adaptations that are important to survival.

**3.1.4.C3** Compare fossils to one another and to currently living organisms according to their anatomical similarities and differences.

**3.2.4.A1** Identify and classify objects based on their observable and measurable physical properties.

Compare and contrast solids, liquids, and gases based on their properties.

**3.2.4.A2** Demonstrate that materials are composed of parts that are too small to be seen without magnification.

**3.2.4.A3** Demonstrate the conservation of **mass** during physical changes such as melting or freezing.

**3.2.4.A4** Recognize that combining two or more substances may make new materials with different properties.

**3.2.4.A5** Use models to demonstrate the physical change as water goes from liquid to ice and from liquid to vapor.

**3.2.4.B1** Explain how an object's change in motion can be observed and measured.

**3.2.4.B2** Identify types of energy and their ability to be stored and changed from one form to another.

**3.2.4.B3** Understand that objects that emit light often emit heat.

**3.2.4.B4** Apply knowledge of basic electrical circuits to the design and construction of simple direct **current** circuits.

Compare and contrast series and parallel circuits.

Demonstrate that magnets have poles that repel and attract each other.

**3.2.4.B5** Demonstrate how vibrating objects make sound and sound can make things vibrate.

Demonstrate how light can be reflected, refracted, or absorbed by an object.

**3.2.4.B6** Give examples of how energy can be transformed from one form to another.

**3.3.4.A1** Describe basic landforms.

Identify the layers of the earth.

Recognize that the surface of the earth changes due to slow processes and rapid processes.

**3.3.4.A2** Identify basic properties and uses of Earth's materials including rocks, soils, water, and gases of the **atmosphere.**

**3.3.4.A3** Recognize that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.

**3.3.4.A4** Recognize Earth's different water resources, including both fresh and saltwater.

Describe phase changes in the forms of water on Earth.

**3.3.4.A5** Describe basic weather elements.

Identify weather patterns over time.

**3.3.4.A6** MODELS/SCALE Identify basic landforms using models and simple maps.

CONSTANCY/ CHANGE Identify simple changes in the earth **system** as air, water, soil and rock interact.

SCALE Explain how basic weather elements are measured.

**3.3.4.B1** Identify planets in our **solar system** and their basic characteristics.

Describe the earth's place in the **solar system** that includes the sun (a star), planets, and many moons.

Recognize that the universe contains many billions of galaxies and that each galaxy contains many billions of stars.

**3.3.4.B2** SCALES Know the basic characteristics and uses of telescopes.

PATTERNS/PHASES Identify major lunar phases.

PATTERNS Explain time (days, seasons) using **solar system** motions.

**3.4.4.A1** Understand that tools, materials, and skills are used to make things and carry out tasks.

**3.4.4.A2** Understand that systems have parts and components that work together.

**3.4.4.A3** Describe how various relationships exist between **technology** and other fields.

**3.4.4.B1** Describe how **technology** affects humans in various ways.

**3.4.4.B2** Explain how the use of **technology** affects the environment in good and bad ways.

**3.4.4.B3** Explain why new **technologies** are developed and old ones are improved in terms of needs and wants.

**3.4.4.B4** Describe how the history of civilization is linked closely to technological development.

**3.4.4.C1** Understand that there is no perfect **design.**

**3.4.4.C2** Describe the **engineering design process**:

Define a problem. Generate ideas. Select a solution and test it. Make the item. Evaluate the item. Communicate the solution with others. Present the results

**3.4.4.C3** Explain how asking questions and making observations help a person understand how things work and can be repaired.

**3.4.4.D1** Investigate how things are made and how they can be improved.

**3.4.4.D2** Recognize and use everyday symbols (e.g. icons, simple electrical symbols measurement) to communicate key ideas.

Identify and use simple hand tools (e.g., hammer, scale) correctly and safely.

**3.4.4.D3** Investigate and assess the influence of a specific **technology** or **system** on the individual, family, community, and environment.

**3.4.4.E1** Identify tools and devices that have been designed to provide information about a healthy lifestyle.

**3.4.4.E2** Identify the **technologies** in agriculture that make it possible for food to be available year round.

**3.4.4.E3** Identify types of energy and the importance of energy conservation.

**3.4.4.E4** Explain how information and communication systems allow information to be transferred from human to human.

**3.4.4.E5** Recognize that a transportation **system** has many parts that work together to help people travel and to move goods from place to place.

**3.4.4.E6** Identify key aspects of manufacturing processes (designing products, gathering resources and using tools to separate, form and combine materials in order to produce products).

**3.4.4.E7** Understand that structures rest on foundations and that some structures are temporary, while others are permanent.

**4.1.4.A** Explain how living things are dependent upon other living and nonliving things for survival.

- Explain what happens to an **organism** when its food supply, access to water, shelter or space (**niche / habitat**) is changed.
- Identify similarities and differences between living **organisms**, ranging from single-celled to multi-cellular **organisms** through the use of microscopes, video, and other media.

**4.1.4.B** Identify how **matter** cycles through an **ecosystem**.

- Trace how death, growth, and decay cycle **matter** through an **ecosystem**

**4.1.4.C** Explain how most life on earth gets its energy from the sun.

**4.1.4.D** Explain how specific adaptations can help **organisms** survive in their **environment.**

**4.1.4.E** Explain that **ecosystems** change over time due to natural and/ or human influences.

**4.2.4.A** Describe the physical characteristics of a **watershed.**

- Identify and explain what determines the boundaries of a **watershed**.
- Identify water systems and their components as either **lotic** or **lentic.**

**4.2.4.B** Describe the characteristics of different types of **wetlands.**

**4.2.4.C** Explain how freshwater **organisms** are adapted to their **environment.**

- Explain the life cycles of **organisms** in a freshwater **environment**

**4.3.4.A** Identify ways humans depend on **natural resources** for survival.

- Identify resources used to provide humans with energy, food, employment, housing and water.

**4.3.4.B** Identify the geographic origins of various **natural resources.**

**4.4.4.A** Describe the journey of local/global agricultural commodities from production to consumption.

**4.4.4.B** Describe how humans rely on the **food and fiber system**.

- Identify Pennsylvania's important agricultural products.

**4.4.4.C** Use scientific inquiry to investigate the composition of various soils.

**4.4.4.D** Identify how **technology** affects the development of civilizations through agricultural production.

**4.5.4.A** Identify how people use **natural resources** in **sustainable** and non-sustainable ways.

**4.5.4.B** Determine the circumstances that cause humans to identify an **organism** as a **pest.**

**4.5.4.C** Describe how human activities affect the **environment.**

**4.5.4.D** Describe a **waste stream.**

- Identify sources of waste derived from the use of **natural resources.**
- Identify those items that can be **recycled** and those that can not.
- Describe how everyday activities may affect the **environment**

**4.5.4.E** Identify different ways human health can be affected by pollution.

**Potential Primary Standards**