

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL

GRADE 1

The goal in the development of the standard was to assure that the six strands and five unifying concepts are interwoven into a fabric of science that represents the true nature of science. Students have the opportunity to develop both the skills and content knowledge necessary to be scientifically literate members of the community.

Strands 1, 2, and 3 are designed to be explicitly taught *and* embedded *within* each of the content Strands 4, 5, and 6, and are not intended to be taught in isolation. The processes, skills, and content of the first three strands are designed to “umbrella” and complement the content of Life Science, Physical Science, and Earth and Space Science.

Strand 1: Inquiry Process

Inquiry Process establishes the basis for students’ learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 1: Observations, Questions, and Hypotheses

Observe, ask questions, and make predictions.

PO 1. Compare common objects using multiple senses.

*PO 2. Ask questions based on experiences with objects, organisms, and events in the environment.
(See M01-S2C1-01)*

PO 3. Predict results of an investigation based on life, physical, and Earth and space sciences (e.g., animal life cycles, physical properties, Earth materials).

Concept 2: Scientific Testing (Investigating and Modeling)

Participate in planning and conducting investigations, and recording data.

PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use of instruments, materials, organisms) in all science inquiry.

PO 2. Participate in guided investigations in life, physical, and Earth and space sciences.

PO 3. Use simple tools such as rulers, thermometers, magnifiers, and balances to collect data (U.S. customary units).
(See M01-S4C4-07)

PO 4. Record data from guided investigations in an organized and appropriate format (e.g., lab book, log, notebook, chart paper).
(See W01-S3C2-01 and W01-S3C3-01)

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Concept 3: Analysis and Conclusions

Organize and analyze data; compare to predictions.

PO 1. Organize (e.g., compare, classify, and sequence) objects, organisms, and events according to various characteristics.

(See M01-S4C4-01)

PO 2. Compare the results of the investigation to predictions made prior to the investigation.

Concept 4: Communication

Communicate results of investigations.

PO 1. Communicate the results of an investigation using pictures, graphs, models, and/or words.

(See M01-S2C1-02 and W01-S3C3-02)

PO 2. Communicate with other groups to describe the results of an investigation.

(See LS-F1)

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Strand 2: History and Nature of Science

Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the inclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor

Identify individual and cultural contributions to scientific knowledge.

PO 1. Give examples of how diverse people (e.g., children, parents, weather reporters, cooks, healthcare workers, gardeners) use science in daily life.

PO 2. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Sally Ride [scientist], supports Strand 6; Neil Armstrong [astronaut, engineer], supports Strand 6).

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

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Strand 3: Science in Personal and Social Perspectives

Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world – as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

No performance objectives at this grade level

Concept 2: Science and Technology in Society

Understand the impact of technology.

PO 1. Identify various technologies (e.g., automobiles, radios, refrigerators) that people use.

PO 2. Describe how suitable tools (e.g., magnifiers, thermometers) help make better observations and measurements.

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Strand 4: Life Science

Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Characteristics of Organisms

Understand that basic structures in plants and animals serve a function.

PO 1. Identify the following as characteristics of living things:

- growth and development
- reproduction
- response to stimulus

PO 2. Compare the following observable features of living things:

- movement – legs, wings
- protection – skin, feathers, tree bark
- respiration – lungs, gills
- support – plant stems, tree trunks

PO 3. Identify observable similarities and differences (e.g., number of legs, body coverings, size) between/among different groups of animals.

Concept 2: Life Cycles

Understand the life cycles of plants and animals.

PO 1. Identify stages of human life (e.g., infancy, adolescence, adulthood).

PO 2. Identify similarities and differences between animals and their parents.
(See 1CH-F4)

Concept 3: Organisms and Environments

Understand the relationships among various organisms and their environment.

PO 1. Identify some plants and animals that exist in the local environment.

PO 2. Compare the habitats (e.g., desert, forest, prairie, water, underground) in which plants and animals live.

PO 3. Describe how plants and animals within a habitat are dependent on each other.

Concept 4: Diversity, Adaptation, and Behavior

Identify plant and animal adaptations.

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Strand 5: Physical Science

Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in a system, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties of Objects and Materials

Classify objects and materials by their observable properties.

PO 1. Classify objects by the following observable properties:

- shape
- texture
- size
- color
- weight

PO 2. Classify materials as solids or liquids.

Concept 2: Position and Motion of Objects

Understand spatial relationships and the way objects move.

PO 1. Demonstrate the various ways that objects can move (e.g., straight line, zigzag, back-and-forth, round-and-round, fast, slow).

Concept 3: Energy and Magnetism

Investigate different forms of energy.

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Strand 6: Earth and Space Science

Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understandings of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, students can make informed decisions about issues affecting the planet on which they live.

Concept 1: Properties of Earth Materials

Identify the basic properties of Earth materials.

PO 1. Describe the following basic Earth materials:

- rocks
- soil
- water

PO 2. Compare the following physical properties of basic Earth materials:

- color
- texture
- capacity to retain water

PO 3. Identify common uses (e.g., construction, decoration) of basic Earth materials (i.e., rocks, water, soil).

PO 4. Identify the following as being natural resources:

- air
- water
- soil
- trees
- wildlife

PO 5. Identify ways to conserve natural resources (e.g., reduce, reuse, recycle, find alternatives).

Concept 2: Objects in the Sky

Identify objects in the sky.

PO 1. Identify evidence that the Sun is the natural source of heat and light on the Earth (e.g., warm surfaces, shadows, shade).

PO 2. Compare celestial objects (e.g., Sun, Moon, stars) and transient objects in the sky (e.g., clouds, birds, airplanes, contrails).

PO 3. Describe observable changes that occur in the sky, (e.g., clouds forming and moving, the position of the Moon).

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Concept 3: Changes in the Earth and Sky

Understand characteristics of weather conditions and climate.

PO 1. Identify the following characteristics of seasonal weather patterns:

- temperature
- type of precipitation
- wind

PO 2. Analyze how the weather affects daily activities.

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