SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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. Formulate relevant questions about the properties of objects, organisms, and events of the environment using observations and prior knowledge.
(See M03-S2C1-01)

PO 2. Predict the results of an investigation based on observed patterns, not random guessing.

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. Plan a simple investigation (e.g., one plant receives adequate water, one receives too much water, and one receives too little water) based on the formulated questions.

PO 3. Conduct simple investigations (e.g., related to plant life cycles, changing the pitch of a sound, properties of rocks) in life, physical, and Earth and space sciences.

PO 4. Use metric and U.S. customary units to measure objects.
(See M03-S4C4-04)

PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log).
(See W03-S3C2-01 and W03-S3C3-01)

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

Concept 3: Analysis and Conclusions
Organize and analyze data; compare to predictions.

PO 1. Organize data using the following methods with appropriate labels:
- bar graphs
- pictographs
- tally charts

(See M03-S2C1-02)

PO 2. Construct reasonable interpretations of the collected data based on formulated questions.
(See M03-S2C1-03)

PO 3. Compare the results of the investigation to predictions made prior to the investigation.

PO 4. Generate questions for possible future investigations based on the conclusions of the investigation.

PO 5. Record questions for further inquiry based on the conclusions of the investigation.

Concept 4: Communication
Communicate results of investigations.

PO 1. Communicate investigations and explanations using evidence and appropriate terminology.
(See W03-S3C2-01)

PO 2. Describe an investigation in ways that enable others to repeat it.
(See W03-S3C2-01 and LS-F1)

PO 3. Communicate with other groups to describe the results of an investigation.
(See LS-E1)

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., John Muir [naturalist], supports Strand 4; Thomas Edison [inventor], supports Strand 5; Mae Jemison [engineer, physician, astronaut], supports Strand 6,; Edmund Halley [scientist], supports Strand 6).
PO 2. Describe science-related career opportunities.

Concept 2: Nature of Scientific Knowledge Understand how science is a process for generating knowledge.
PO 1. Describe how, in a system (e.g., terrarium, house) with many components, the components usually influence one another.
PO 2. Explain why a system may not work if a component is defective or missing.

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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.
PO 1. Describe the major factors that could impact a human population (e.g., famine, drought, disease, improved transportation, medical breakthroughs). PO 2. Describe the beneficial and harmful impacts of natural events and human activities on the environment (e.g., forest fires, flooding, pesticides).

Concept 2: Science and Technology in Society Understand the impact of technology.
PO 1. Identify ways that people use tools and techniques to solve problems. PO 2. Describe the development of different technologies (e.g., communication, entertainment, transportation, medicine) in response to resources, needs, and values. PO 3. Design and construct a technological solution to a common problem or need using common materials.

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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. Describe the function of the following plant structures:
- roots – absorb nutrients
- stems – provide support
- leaves – synthesize food
- flowers – attract pollinators and produce seeds for reproduction

Concept 2: Life Cycles

Understand the life cycles of plants and animals.

PO 1. Compare life cycles of various plants (e.g., conifers, flowering plants, ferns).

PO 2. Explain how growth, death, and decay are part of the plant life cycle.

Concept 3: Organisms and Environments

Understand the relationships among various organisms and their environment.

PO 1. Identify the living and nonliving components of an ecosystem.

PO 2. Examine an ecosystem to identify microscopic and macroscopic organisms.

PO 3. Explain the interrelationships among plants and animals in different environments:
- producers – plants
- consumers – animals
- decomposers – fungi, insects, bacteria

PO 4. Describe how plants and animals cause change in their environment.

PO 5. Describe how environmental factors (e.g., soil composition, range of temperature, quantity and quality of light or water) in the ecosystem may affect a member organism's ability to grow, reproduce, and thrive.

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

Concept 4: Diversity, Adaptation, and Behavior Identify plant and animal adaptations.
PO 1. Identify adaptations of plants and animals that allow them to live in specific environments. PO 2. Describe ways that species adapt when introduced into new environments. PO 3. Cite examples of how a species' inability to adapt to changing conditions in the ecosystem led to the extinction of that species.

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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.
No performance objectives at this grade level

Concept 2: Position and Motion of Objects Understand spatial relationships and the way objects move.
No performance objectives at this grade level

Concept 3: Energy and Magnetism Investigate different forms of energy.
PO 1. Demonstrate that light can be: • reflected (with mirrors) • refracted (with prisms) • absorbed (by dark surfaces) PO 2. Describe how light behaves on striking objects that are: • transparent (clear plastic) • translucent (waxed paper) • opaque (cardboard) PO 3. Demonstrate that vibrating objects produce sound. PO 4. Demonstrate that the pitch of a sound depends on the rate of the vibration (e.g., a long rubber band has a lower pitch than a short rubber band).

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.

SCIENCE STANDARD ARTICULATED BY GRADE LEVEL
GRADE 3

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. Identify the layers of the Earth:
- crust
- mantle
- core (inner and outer)

PO 2. Describe the different types of rocks and how they are formed:
- metamorphic
- igneous
- sedimentary

PO 3. Classify rocks based on the following physical properties:
- color
- texture

PO 4. Describe fossils as a record of past life forms.

PO 5. Describe how fossils are formed.

PO 6. Describe ways humans use Earth materials (e.g., fuel, building materials, growing food).

Concept 2: Objects in the Sky
Identify objects in the sky.

No performance objectives at this grade level

Concept 3: Changes in the Earth and Sky
Understand characteristics of weather conditions and climate.

No performance objectives at this grade level

Italics denote a repetition of a performance objective (learned in an earlier grade) that is to be applied to grade level content or at a higher level of complexity.
The bulleted items within a performance objective indicate specific content to be taught.