

**New Mexico Science Content Standards, Benchmarks,**

**Strands and Benchmarks**

**Kindergarten – 4th Grade**

**Strand II: Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**K-4 Benchmark I:** Recognize that matter has different forms and properties.

**Grade                      Performance Standards**

**K**        Observe that different materials have different properties (e.g., color, odor).

**1**        Observe that the three states of matter (i.e., solids, liquids, and gases) have different properties (e.g., water can be liquid, ice, or steam).

Describe simple properties of matter (e.g., hardness, flexibility, transparency).

**2**        Observe that properties of substances can change when they are mixed, cooled, or heated (e.g., salt dissolves in water, ice melts).

Describe the changes that occur when substances are heated or cooled and change from one state of matter to another (i.e., solid, liquid, and gas).

**4**        Know that changes to matter may be chemical or physical and when two or more substances are combined, a new substance may be formed with properties that are different from those of the original substances.

### 5th – 8th Grade

#### **Strand II: Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**5-8 Benchmark I:** Know the forms and properties of matter and how matter interacts.

#### **GradePerformance Standards**

**5** Describe properties (e.g., relative volume, ability to flow) of the three states of matter. Describe how matter changes from one phase to another (e.g., condensation, evaporation).

#### **8 Changes in Matter**

Know that phase changes are physical changes that can be reversed (e.g., evaporation, condensation, melting).

Describe various familiar physical and chemical changes that occur naturally (e.g., snow melting, photosynthesis, rusting, burning).

#### **Strand II: Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**5-8 Benchmark II:** Explain the physical processes involved in the transfer, change, and conservation of energy.

#### **GradePerformance Standards**

**5** Know that heat is transferred from hotter to cooler materials or regions until both reach the same temperature.

**6** Understand that heat energy can be transferred through conduction, radiation and convection.

#### **Strand II: Content of Science**

**Standard II (Life Science):** Understand the properties, structures, and processes of living things and the interdependence of living things and their environments.

**5-8 Benchmark III:** Understand the structure of organisms and the function of cells in living systems.

#### **GradePerformance Standards**

**5** Understand that all living organisms are composed of cells from one to many trillions, and that cells are usually only visible through a microscope.

#### **7 Structure of Organisms**

Understand that organisms are composed of cells and identify unicellular and multicellular organisms.

Explain how organs are composed of tissues of different types of cells (e.g., skin, bone, muscle, heart, intestines).

**9th – 12th Grade**

**Strand II: The Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**9-12 Benchmark I:** Understand the properties, underlying structure, and reactions of matter.

1. Grade      **Performance Standards**

**9-12 Structure of Matter**

8. Understand how the type and arrangement of atoms and their bonds determine macroscopic properties (e.g., boiling point, electrical conductivity, hardness of minerals).
9. Know that states of matter (i.e., solid, liquid, gas) depend on the arrangement of atoms and molecules and on their freedom of motion.

**Strand II: The Content of Science**

**Standard I (Physical Science):** Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy.

**9-12 Benchmark II:** Understand the transformation and transmission of energy and how energy and matter interact.

Grade      **Performance Standards**

9-12      **Energy Transformation and Transfer**

1. Explain how thermal energy (heat) consists of the random motion and vibrations of atoms and molecules and is measured by temperature.
2. Understand how heat can be transferred by conduction, convection, and radiation, and how heat conduction differs in conductors and insulators.
3. Explain how heat flows in terms of the transfer of vibrational motion of atoms and molecules from hotter to colder regions.

**Strand III: Science and Society**

**Standard I:** Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies.

**9-12 Benchmark I:** Examine and analyze how scientific discoveries and their applications affect the world, and explain how societies influence scientific investigations and applications.

Grade      **Performance Standards**

9-12

**Science and Technology**

1. Know how science enables technology but also constrains it, and recognize the difference between real technology and science fiction.
2. Understand how advances in technology enable further advances in science.

Cryogenics ~ Museum Explorations 2006-2007  
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3. Understand the scientific foundations of common technologies (e.g., kitchen appliances, radio, television, aircraft, rockets, computers, medical X-rays, selective breeding, fertilizers and pesticides, agricultural equipment).

**Science and Society**

9. Describe major historical changes in scientific perspectives (e.g., atomic theory, germs, cosmology, relativity, plate tectonics, evolution) and the experimental observations that triggered them.
10. Know that societal factors can promote or constrain scientific discovery.

**Science and Individuals**

Understand that reasonable people may disagree about some issues that are of interest to both science and religion (e.g., the origin of life on Earth, the cause of the Big Bang, the future of Earth).

Identify important questions that science cannot answer (e.g., questions that are beyond today's science, decisions that science can only help to make, questions that are inherently outside of the realm of science).