

# NEW MEXICO Grade 4 SCIENCE STANDARDS

## **Strand I: Scientific Thinking and Practice**

**Standard I:** Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting and validating to think critically.

**K-4 Benchmark I:** Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data.

1. Use instruments to perform investigations (e.g., timers, balances) and communicate findings.
2. Differentiate observation from interpretation and understand that a scientific explanation comes in part from what is observed and in part from how observation is interpreted.
3. Conduct multiple trials to test a prediction, draw logical conclusions, and construct and interpret graphs from measurements.
4. Collect data in an investigation using multiple techniques, including control groups, and analyze those data to determine what other investigations could be conducted to validate findings.

**K-4 Benchmark II:** Use scientific thinking and knowledge and communicate findings.

1. Communicate ideas and present findings about scientific investigations that are open to critique from others.
2. Describe how scientific investigations may differ from one another (e.g., observations of nature, measurements of things changing over time).
3. Understand how data are used to explain how a simple system functions (e.g., a thermometer to measure heat loss as water cools).

**K-4 Benchmark III:** Use mathematical skills and vocabulary to analyze data, understand patterns and relationships, and communicate findings.

1. Conduct multiple trials using simple mathematical techniques to make and test predictions.
2. Use mathematical equations to formulate and justify predictions based on cause-and-effect relationships.
3. Identify simple mathematical relationships in a scientific investigation (e.g., the relationship of the density of materials that will or will not float in water to the density of water).

# NEW MEXICO Grade 4 SCIENCE STANDARDS

## **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.

1. 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 (e.g., white glue and borax, cornstarch and water, vinegar and baking soda).
2. Know that materials are made up of small particles (atoms and molecules) that are too small to see with the naked eye.
3. Know that the mass of the same amount of material remains constant whether it is together, in parts, or in a different state.

### **K-4 Benchmark II:** Know that energy is needed to get things done and that energy has different forms.

1. Identify the characteristics of several different forms of energy and describe how energy can be converted from one form to another (e.g., light to heat, motion to heat, electricity to heat, light, or motion).
2. Recognize that energy can be stored in many ways (e.g., potential energy in gravity or springs, chemical energy in batteries).
3. Describe how some waves move through materials (e.g., water, sound) and how others can move through a vacuum (e.g., x-ray, television, radio).
4. Demonstrate how electricity flows through a simple circuit (e.g., by constructing one).

### **K-4 Benchmark III:** Identify forces and describe the motion of objects.

1. Know that energy can be carried from one place to another by waves (e.g., water waves, sound waves), by electric currents, and by moving objects.
2. Describe the motion of an object by measuring its change of position over a period of time.
3. Describe that gravity exerts more force on objects with greater mass (e.g., it takes more force to hold up a heavy object than a lighter one).
4. Describe how some forces act on contact and other forces act at a distance (e.g., a person pushing a rock versus gravity acting on a rock).

# NEW MEXICO Grade 4 SCIENCE STANDARDS

## **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.

### **K-4 Benchmark I:** Know that living things have diverse forms, structures, functions, and habitats.

1. Explain that different living organisms have distinctive structures and body systems that serve specific functions (e.g., walking, flying, swimming).
2. Know that humans and other living things have senses to help them detect stimuli, and that sensations (e.g., hunger) and stimuli (e.g., changes in the environment) influence the behavior of organisms.
3. Describe how roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight (photosynthesis).
4. Describe the components of and relationships among organisms in a food chain (e.g., plants are the primary source of energy for living systems).
5. Describe how all living things are made up of smaller units that are called cells.

### **K-4 Benchmark II:** Know that living things have similarities and differences and that living things change over time.

1. Know that in any particular environment some kinds of plants and animals survive well, some survive less well, and others cannot survive at all.
2. Know that a change in physical structure or behavior can improve an organism's chance of survival (e.g., a chameleon changes color, a turtle pulls its head into its shell, a plant grows toward the light).
3. Describe how some living organisms have developed characteristics from generation to generation to improve chances of survival (e.g., spines on cacti, long beaks on hummingbirds, good eyesight on hawks).

### **K-4 Benchmark III:** Know the parts of the human body and their functions.

1. Know that the human body has many parts that interact to function as systems (e.g., skeletal, muscular) and describe the parts and their specific functions in selected systems (e.g., the nose, lungs, and diaphragm in the respiratory system).
2. Recognize that the human body is organized from cells, to tissues, to organs, to systems, to the organism.

# NEW MEXICO Grade 4 SCIENCE STANDARDS

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

**Standard III (Earth and Space Science):** Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth's systems.

### **K-4 Benchmark I:** Know the structure of the solar system and the objects in the universe.

1. Understand that the number of stars visible through a telescope is much greater than the number visible to the naked eye.
2. Know that there are various types of telescopes that use different forms of light to observe distant objects in the sky.
3. Know that the pattern of stars (e.g., constellations) stays the same although they appear to move across the sky nightly due to Earth's rotation.

### **K-4 Benchmark II:** Know the structure and formation of Earth and its atmosphere and the processes that shape them.

1. Know that the properties of rocks and minerals reflect the processes that shaped them (i.e., igneous, metamorphic, and sedimentary rocks).
2. Describe how weather patterns generally move from west to east in the United States.
3. Know that local weather information describes patterns of change over a period of time (e.g., temperature, precipitation symbols, cloud conditions, wind speed/direction).

## **Strand III: Science and Society**

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

### **K-4 Benchmark I:** Describe how science influences decisions made by individuals and societies.

1. Know that science has identified substances called pollutants that get into the environment and can be harmful to living things.
2. Know that, through science and technology, a wide variety of materials not appearing in nature have become available (e.g., steel, plastic, nylon, fiber optics).
3. Know that science has created ways to store and retrieve information (e.g., paper and ink, printing press, computers, CD ROMs) but that these are not perfect (e.g., faulty programming, defective hardware).
4. Know that both men and women of all races and social backgrounds choose science as a career.