**NEW MEXICO K-4 SCIENCE STANDARDS**

Kindergarten – 4th Grade

**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.

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<tr>
<th>Grade</th>
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</table>
| K     | 1. Use observation and questioning skills in science inquiry (e.g., What happens when something is pushed or pulled?).  
      2. Ask and answer questions about surroundings and share findings with classmates.  
      3. Record observations and data with pictures, numbers, and/or symbols. |
| 1     | 1. Make observations, develop simple questions, and make comparisons of familiar situations (e.g., What does the seed look like when it starts to grow?).  
      2. Describe relationships between objects (e.g., above, next to, below) and predict the results of changing the relationships (e.g., When that block moves, what will happen to the one next to it?). |
| 2     | 1. Conduct simple investigations (e.g., measure the sizes of plants of the same kind that are grown in sunlight and in shade).  
      2. Use tools to provide information not directly available through only the senses (e.g., magnifiers, rulers, thermometers).  
      3. Make predictions based on observed patterns as opposed to random guessing.  
      4. Follow simple instructions for scientific investigation. |
| 3     | 1. Make new observations when discrepancies exist between two descriptions of the same object or phenomenon to improve accuracy.  
      2. Recognize the difference between data and opinion.  
      3. Use numerical data in describing and comparing objects, events, and measurements.  
      4. Collect data in an investigation and analyze those data.  
      5. Know that the same scientific laws govern investigations in different times and places (e.g., gravity, growing plants). |
### NEW MEXICO K-4 SCIENCE STANDARDS

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<tbody>
<tr>
<td>K</td>
<td>1. Communicate observations and answer questions about surroundings.</td>
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<tr>
<td>1</td>
<td>1. Know that simple investigations do not always turn out as planned.</td>
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</table>
| 2     | 1. Understand that in doing science it is often helpful to work with a team and share findings.  
|       | 2. Make accurate observations and communicate findings about investigations. |
| 3     | 1. Use a variety of methods to display data and present findings.  
|       | 2. Understand that predictions are based on observations, measurements, and cause-and-effect relationships. |
| 4     | 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). |

### 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 II:** Use scientific thinking and knowledge and communicate findings.
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 III: Use mathematical skills and vocabulary to analyze data, understand patterns and relationships, and communicate findings.

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<tr>
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<tr>
<td>K</td>
<td>1. Observe and describe the relative sizes and characteristics of objects (e.g., bigger, brighter, louder, smellier).</td>
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<tr>
<td>1</td>
<td>1. Use numbers and mathematical language (e.g., “addition” instead of “add to,” “subtraction” instead of “take away”) to describe phenomena.</td>
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</table>
| 2     | 1. Record observations on simple charts or diagrams.  
      2. Measure length, weight, and temperature with appropriate tools and express those measurements in accurate mathematical language. |
| 3     | 1. Use numerical data in describing and comparing objects, events, and measurements.  
      2. Pose a question of interest and present observations and measurements with accuracy.  
      3. Use various methods to display data and present findings and communicate results in accurate mathematical language. |
| 4     | 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). |
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.

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<tr>
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| K     | 1. Observe that objects are made of different types of materials (e.g., metal, plastic, cloth, wood).  
       | 2. Observe that different materials have different properties (e.g., color, odor). |
| 1     | 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).  
       | 2. Describe simple properties of matter (e.g., hardness, flexibility, transparency). |
| 2     | 1. Observe that properties of substances can change when they are mixed, cooled, or heated (e.g., salt dissolves in water, ice melts).  
       | 2. 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). |
| 3     | 1. Identify and compare properties of pure substances and mixtures (e.g., sugar, fruit juice).  
       | 2. Separate mixtures based on properties (e.g., by size or by substance; rocks and sand, iron filings and sand, salt and sand). |
| 4     | 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. |
NEW MEXICO K-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 II: Know that energy is needed to get things done and that energy has different forms.

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<td>K</td>
<td>1. Observe how energy does things (e.g., batteries, the sun, wind, electricity).</td>
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<td></td>
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<td>2. Know that heat moves more rapidly in thermal conductors (e.g., metal pan) than in insulators (e.g., plastic handle).</td>
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<td>3. Describe the usefulness of some forms of energy (e.g., electricity, sunlight, wind, sound) and how energy (e.g., heat, light,) can affect common objects (e.g., sunlight warms dark objects, heat melts candles).</td>
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<td>4. Observe that sound is made by vibrating objects and describe it by its pitch and loudness.</td>
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<td>5. Recognize that moving objects carry energy (kinetic energy).</td>
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<tr>
<td>2</td>
<td>1. Describe how heat can be produced (e.g., burning, rubbing, mixing some substances).</td>
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<td>1. Understand that light is a form of energy and can travel through a vacuum.</td>
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<td>2. Know that light travels in a straight line until it strikes an object and then it is reflected, refracted, or absorbed.</td>
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<td>3. Measure energy and energy changes (e.g., temperature changes).</td>
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<td>4. Construct charts or diagrams that relate variables associated with energy changes (e.g., melting of ice over time).</td>
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<td>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).</td>
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<td>2. Recognize that energy can be stored in many ways (e.g., potential energy in gravity or springs, chemical energy in batteries).</td>
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<td>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).</td>
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<td>4. Demonstrate how electricity flows through a simple circuit (e.g., by constructing one).</td>
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NEW MEXICO K-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 III: Identify forces and describe the motion of objects.

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| K     | 1. Observe things move in different ways (e.g., straight line, vibration, circular).  
      | 2. Know that the position and motion of an object (direction or speed) are changed by pushing or pulling it. |
| 1     | 1. Describe ways to make things move, what causes them to stop, and what causes a change of speed, or change of direction.  
      | 2. Observe that gravity makes things fall to the ground unless something holds them up. |
| 2     | 1. Describe how the strength of a push or pull affects the change in an object’s motion (e.g., how a big or small push affects how high a swing rises).  
      | 2. Observe that electrically charged materials and magnets attract and repel each other, and observe their effects on other kinds of materials. |
| 3     | 1. Recognize that magnets can produce motion by attracting some materials (e.g., steel) and have no effect on others (e.g., plastics).  
      | 2. Describe how magnets have poles (N and S) and that like poles repel each other while unlike poles attract.  
      | 3. Observe that some forces produce motion without objects touching (e.g., magnetic force on nails).  
      | 4. Describe motion on different time scales (e.g., the slow motion of a plant toward light, the fast motion of a tuning fork). |
| 4     | 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 K-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.

<table>
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<tr>
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| K     | 1. Identify major structures of common living organisms (e.g., stems, leaves, and roots of plants; arms, wings, and legs of animals).  
2. Observe that differences exist among individual living organisms (e.g., plants, animals) of the same kind. |
| 1     | 1. Know that living organisms (e.g., plants, animals) have needs (e.g., water, air, food, sunlight).  
2. Know that living organisms (e.g., plants, animals) inhabit various environments and have various external features to help them satisfy their needs (e.g., leaves, legs, claws).  
3. Describe the differences and similarities among living organisms (e.g., plants, animals).  
4. Observe that living organisms (e.g., plants, animals) have predictable but varied life cycles. |
| 2     | 1. Observe that diversity exists among individuals within a population.  
2. Observe and describe various shapes of fungi.  
3. Know that bacteria and viruses are germs. |
| 3     | 1. Know that an adaptation in physical structure or behavior can improve an organism’s chance for survival (e.g., horned toads, chameleons, cacti, mushrooms).  
2. Observe that plants and animals have structures that serve different functions (e.g., shape of animals’ teeth).  
3. Classify common animals according to their observable characteristics (e.g., body coverings, structure).  
4. Classify plants according to their characteristics (e.g., tree leaves, flowers, seeds). |
| 4     | 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. |
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 II: Know that living things have similarities and differences and that living things change over time.

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<thead>
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| **K** | 1. Observe and describe similarities and differences in the appearance and behavior of living organisms (e.g., plants, animals).  
2. Observe that living organisms (e.g., plants, animals) closely resemble their parents. |
| **1** | 1. Identify differences between living and nonliving things.  
2. Recognize the differences between mature and immature plants and animals (e.g., trees/seedlings, dogs/puppies, cats/kittens). |
| **2** | 1. Explain that stages of the life cycle are different for different animals (e.g., mouse, cat, horse, butterfly, frog).  
2. Observe that many characteristics of the offspring of living organisms (e.g., plants or animals) are inherited from their parents.  
3. Observe how the environment influences some characteristics of living things (e.g., amount of sunlight required for plant growth). |
| **3** | 1. Identify how living things cause changes to the environments in which they live, and that some of these changes are detrimental to the organism and some are beneficial.  
2. Know that some kinds of organisms that once lived on Earth have become extinct (e.g., dinosaurs) and that others resemble those that are alive today (e.g., alligators, sharks). |
| **4** | 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). |
### NEW MEXICO K-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 III:** Know the parts of the human body and their functions.

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| K     | 1. Use the senses (e.g., sight, hearing, smell, taste, touch) to observe surroundings, and describe the observations.  
2. Identify the parts of the human body (e.g., legs, arms, head, hands) and the functions of these parts. |
| 1     | 1. Describe simple body functions (e.g., breathing, eating).  
2. Describe the basic food requirements for humans.  
3. Describe how some parts of human bodies differ from similar parts of other animals (e.g., hands and feet/paws; ears). |
| 2     | 1. Identify a variety of human organs (e.g., lungs, heart, stomach, brain).  
2. Know that various nutrients are required for specific parts and functions of the body (e.g., milk for bones and teeth, protein for muscles, sugar for energy).  
3. Identify the functions of human systems (e.g., respiratory, circulatory, digestive). |
| 3     | 1. Know that bacteria and viruses are germs that affect the human body.  
2. Describe the nutrients needed by the human body. |
| 4     | 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. |
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.

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| K     | 1. Observe that there are many objects in the night sky and that some are brighter than others.  
      | 2. Describe the location and movements of objects in the sky (e.g., stars, sun, moon). |
| 1     | 1. Observe the changes that occur in the sky as day changes into night and night into day.  
      | 2. Describe the basic patterns of objects as they move through the sky:  
      |   • sun appears in the day  
      |   • moon appears at night but can sometimes be seen during the day  
      |   • sun and moon appear to move across the sky  
      |   • moon appears to change shape over the course of a month.  
      | 3. Recognize that the sun, moon, and stars all appear to move slowly across the sky. |
| 2     | 1. Observe that the phase of the moon appears a little different every day but looks the same again after about four weeks.  
      | 2. Observe that some objects in the night sky are brighter than others.  
      | 3. Know that the sun is a star. |
| 3     | 1. Describe the objects in the solar system (e.g., sun, Earth and other planets, moon) and their features (e.g., size, temperature).  
      | 2. Describe the relationships among the objects in the solar system (e.g., relative distances, orbital motions).  
      | 3. Observe that the pattern of stars stays the same as they appear to move across the sky nightly.  
      | 4. Observe that different constellations can be seen in different seasons.  
      | 5. Know that telescopes enhance the appearance of some distant objects in the sky (e.g., the moon, planets). |
| 4     | 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. |
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 II: Know the structure and formation of Earth and its atmosphere and the processes that shape them.

<table>
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| K     | 1. Observe that changes in weather occur from day to day and season to season.  
      | 2. Observe that the sun warms the land and water and they warm the air. |
| 1     | 1. Know that simple tools can be used to measure weather conditions (e.g., thermometer, wind sock, hand held anemometer, rain gauge) and that measurements can be recorded from day to day and across seasons.  
      | 2. Know that there are different climates (e.g., desert, arctic, rainforest). |
| 2     | 1. Know that rocks have different shapes and sizes (e.g., boulders, pebbles, sand) and that smaller rocks result from the breaking and weathering of larger rocks.  
      | 2. Understand that rocks are made of materials with distinct properties.  
      | 3. Know that soil is made up of weathered rock and organic materials, and that soils differ in their capacity to support the growth of plants.  
      | 4. Recognize the characteristics of the seasons. |
| 3     | 1. Know that Earth’s features are constantly changed by a combination of slow and rapid processes that include the action of volcanoes, earthquakes, mountain building, biological changes, erosion, and weathering.  
      | 2. Know that fossils are evidence of earlier life and provide data about plants and animals that lived long ago.  
      | 3. Know that air takes up space, is colorless, tasteless, and odorless, and exerts a force.  
      | 4. Identify how water exists in the air in different forms (e.g., in clouds and fog as tiny droplets; in rain, snow, and hail) and changes from one form to another through various processes (e.g., freezing/condensation, precipitation, evaporation). |
| 4     | 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). |
**NEW MEXICO K-4 SCIENCE STANDARDS**

**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.

<table>
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| K     | 1. Recognize that germs exist and may cause disease.  
2. Describe how science helps provide products we use every day (e.g., gasoline for cars; electricity for lights, refrigerators, TVs; gas or electricity for heating, cooking). |
| 1     | 1. Know that germs can be transmitted by touching, breathing, and coughing, and that washing hands helps prevent the spread of germs.  
2. Describe how science has assisted in creating tools (e.g., plows, knives, telephones, cell phones, computers) to make life easier and more efficient.  
3. Describe how tools and machines can be helpful, harmful, or both (e.g., bicycles, cars, scissors, stoves).  
4. Know that men and women of all ethnic and social backgrounds practice science and technology. |
| 2     | 1. Describe ways to prevent the spread of germs (e.g., soap, bleach, cooking).  
2. Know that science has ways to help living things avoid sickness or recover from sickness (e.g., vaccinations, medicine) and adult supervision is needed to administer them.  
3. Know that some materials are better than others for making particular things (e.g., paper, cardboard, plastic, metal, fiberglass, wood).  
4. Understand that everybody can do science, invent things, and formulate ideas.  
5. Know that science has discovered many things about objects, events, and nature and that there are many more questions to be answered. |
| 3     | 1. Describe how food packaging (e.g., airtight containers, date) and preparation (heating, cooling, salting, smoking, drying) extend food life and the safety of foods (e.g., elimination of bacteria).  
2. Know that science produces information for the manufacture and recycling of materials (e.g., materials that can be recycled [aluminum, paper, plastic] and others that cannot [gasoline]).  
3. Know that naturally occurring materials (e.g., wood, clay, cotton, animal skins) may be processed or combined with other materials to change their properties.  
4. Know that using poisons can reduce the damage to crops caused by rodents, weeds, and insects, but their use may harm other plants, animals, or the environment. |
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.