

**Bethlehem Lutheran School, Lakewood, CO**  
**Science Curriculum Grade 4 (revised 4/01)**

*God created, rules and orders His universe. Science is the framework through which we discover, observe, analyze and synthesize the natural laws of God's creation. Understanding these laws and the systematic nature of the world assists and enhances the student's awareness and ability to be a better steward of God's earth and universe.*

*Science provides a conceptual framework for the understanding of natural phenomena and their causes and effects. Science study develops students who are scientifically literate, able to recognize that science is not value-free, and are capable of making ethical and moral judgments regarding science, social and technological issues.*

*To provide the student with an understanding of God's creation in the areas of Life Science, Physical Science, and Earth Science through facts, observation, and experimentation.*

**State Standard 1**

*Students understand the processes of scientific investigation and design, conduct, communicate about and evaluate such investigations.*

**Classroom objectives**

- 1.1 Develop the skills of collecting and organizing information to solve problems by using bar and line graphs, flow diagrams, metric rulers and grids, thermometers, graduated cylinders, light meters, tables, balances, hydrometers, and clocks.

**State Standard 2**

*Physical Science: Students know and understand common properties, forms, and changes in matter and energy.*

**Classroom objectives**

- 2.1 Understand about light energy and its relationship to sound: observe light energy as seen in the visible spectrum and describe its colors; distinguish between reflection, absorption, and transmission of light and explain how light affects an object's appearance; understand how flat and curved mirrors reflect light to form images, that light bends when it moves from one material to another, and identify objects that can bend light; describe how light waves are different from sound waves.

- 2.1 Examine what matter is made of and how it is measured; learn that matter has mass, takes up space, and is found in three states: solid, liquid, or gas; learn that matter is composed of atoms, molecules, elements, and compounds and to distinguish among those terms, learn the differences between mixtures and solutions; become aware that the physical properties of matter are observable and can be measured; and will distinguish between measuring mass and measuring density.
- 2.2 Understand that force makes things move and the effect that friction has on motion; learn the scientific definition of work and give examples of work being done; learn to distinguish between kinetic and potential energy; identify six simple machines and explain how each functions; give examples of compound and complex machines.
- 2.3 Explore the electrical and magnetic nature of matter and how the two are related: observe examples of electrical charges and explain how these charges build up; learn that electricity can move only through a closed circuit; distinguish between conductors and insulators of electricity; understand that the earth is a magnet and use that information to interpret compass directions; describe how a magnet can be used to make electricity, and how electricity can be used to make a magnet.

### State Standard 3

*Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.*

#### Classroom objectives

- 3.1 Explore the classification and functions of flowering plant parts and learn that plants can be divided into two groups as those that make seeds and those that do not; identify and explain the function of each part of a typical flower; learn how seeds and fruits develop and how seeds are scattered.
- 3.2 Learn how members of an animal group cooperate to aid the survival of the group: compare young animals that can take care of themselves with those that need care from adults; become familiar with behaviors that animals are born with (instincts and reflexes) and behaviors that are learned.
- 3.3 Learn about the interdependence of plants and animals: learn that green plants are producers and can change energy from the sun into a form that can be used and stored; identify animals as consumers-herbivores, carnivores, or omnivores-based on their food sources; trace that path of energy and materials from one living thing to another in a land or water food chain; understand the interdependence of organisms when food chains overlap to form food webs.
- 3.4 Learn how plants and animals are suited to life in their surroundings; learn what an adaptation is and how adaptations help organisms meet their needs.
- 3.5 Understand how the digestive and circulatory systems function: learn how the organs of the digestive system work together to break down food so it can be used by the body; learn how the circulatory system carries oxygen and nutrients to body cells, carries wastes away from the cells, and helps the body fight infections; learn how to keep their body systems healthy, by eating good foods, exercising regularly, and avoiding harmful drugs.
- 3.6 Understand how the brain receives and interprets information from the sense organs: trace the path of light through the eye and

describe the function of each part of the eye; learn about the path sound waves take through the ear and how these waves stimulate the auditory nerve; learn how the tongue and nose work together to provide the senses of taste and smell; describe how the skin helps us detect touch, pressure, pain, heat, and cold.

- 3.7 Understand about the social-psychological and physiological aspects of human sexuality from a distinctively Christian point of view in the context of our relationship to God: learn that sex is another good gift from God to be used responsibly; obtain answers to questions about sex which typical middle elementary students raise and to do so in a Christian context; develop a sense of reverence and thanks for the system of reproduction.

### State Standard 4

*Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.*

#### Classroom objectives

- 4.1 Explore what causes weather and how weather conditions are measured: learn how the angle of sunlight hitting the earth affects air pressure and wind; explore the relationship between temperature and the three major types of clouds; identify four kinds of precipitation that result from changes in the air; understand how meteorologists obtain information about current weather conditions and how this information is used to predict weather.
- 4.2 Understand the composition of the earth and how changes in landforms occur: learn about three kinds of landforms; mountains, plains, and plateaus, and the three layers of the earth-the crust, mantle, and core; identify igneous, sedimentary, and metamorphic rocks and describe how these rocks are formed; explore how volcanoes and earthquakes change the shape of the land and describe how scientists try to predict these events; learn how weathering and erosion change the earth's surface.
- 4.3 Understand the importance of oceans in the environment: learn the names and locations of the four main oceans, as well as the resources that come from the oceans; learn three ways that ocean water moves-currents, waves and tides, and describe how this

movement of water affects beaches; describe the many ways that oceanographers study the ocean bottom to obtain valuable information about the earth.

- 4.4 Learn about the forces that cause movement of the planets, moon, and other objects in our solar system: learn the cause of the earth's days, nights, years, and seasons; observe how sunlight affects the earth as the earth rotates and revolves; become aware that the revolution of the moon around the earth causes the phases of the moon as well as lunar and solar eclipses; compare the characteristics of each of the nine planets; differentiate between asteroids, comets, and meteors; learn about the forces of rocket flight-thrust, drag, and guidance, by building and launching rockets.

### **State Standard 5**

*Students know and understand interrelationships among science, technology and human activity and how they can affect the world.*

#### **Classroom objectives**

- 5.1 Learn about various careers in the four major areas of science.

### **State Standard 6**

*Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.*

#### **Classroom objectives**

- 6.1 Explain how scientists decide what to believe, especially in relation to the Biblical perspective.
- 6.2 Relate science to others ways of knowing.
- 6.3 Explain how people of diverse cultures have contributed to and influenced developments in science