

Bethlehem Lutheran School, Lakewood, CO
Science Curriculum Grade 5 (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 The student will be able to identify variables in an experiment; set up a control in an experiment; collect data from an experiment; set up an experiment to test a hypothesis; predict an outcome; identify variables in an experiment; make conclusions from an experiment; and use a model to test a hypothesis.

State Standard 2

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

Classroom objectives

- 2.1 The student will be able to list four physical properties of matter; explain that a chemical property can only be observed by changing the identity of a substance; describe an atom; list and describe the parts of an atom; describe an element; contrast metals and nonmetals; explain how elements are organized in the periodic table; contrast a molecule of an element with a molecule of a compound; translate a chemical formula; contrast the properties of a

compound with the properties of its elements; describe three types of solutions; explain how solutions differ from other kinds of mixtures; and contrast solutions and suspensions.

- 2.2 The student will be able to contrast heat and temperature; state the direction of heat flow; identify radiation as energy that can travel through empty space; describe how molecules react to an increase and decrease in temperature.

- 2.3 The student will be able to compare and contrast kinetic and potential energy; list and describe six forms of energy; describe how energy changes form; explain how the movement of electrons causes electricity; describe how batteries and generators change other forms of energy into electric energy; list the three parts of a circuit; describe how electrical energy can be changed into thermal, radiant, and mechanical energy; identify kilowatt-hour as a unit for measuring electric energy and watt as a unit for measuring electric power; list many ways to use electricity safely; define force; and identify the newton as the unit for measuring force and the joule as the unit for measuring work. The student will be able to list sources of energy.

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 The student will be able to explain how adaptations affect a species survived.
- 3.2 The student will be able to describe the relationship between cells, tissues, organs and systems; list the life processes of all living things; describe how scientists classify organisms into kingdoms; list the five kingdoms of scientific classification; describe how scientists use traits to divide kingdoms into smaller groups; explain the function of scientific names; and explain why the classification system changes.
- 3.3 The student will be able to describe how most plants take in water; describe how water gets from the roots to the leaves; describe how a plant takes in light and carbon dioxide; identify chloroplasts as the food-making parts of a plant cell; describe the process of photosynthesis and respiration; explain how plants get rid of wastes; list the main parts of flower and describe the function of each part; describe how conifers produce seeds; describe how seedless plants reproduce with spores; and list ways plants can reproduce without seeds or spores.
- 3.4 The student will be able to relate an animal's cell structure to its need to eat other organisms; describe the difference between vertebrates and invertebrates; list the characteristics of sponges, invertebrates with stinging cells, flatworms, roundworms, segmented worms, spiny-skinned invertebrates, mollusks and arthropods; list the characteristics of crustaceans, arachnids, insects, millipedes, and centipedes; and list the characteristics of fish, amphibians, reptiles, birds, and mammals.
- 3.5 The student will be able to describe a population and community; define habitat; compare a habitat to a niche; describe how nutrients and energy flow through a community; explain how organisms compete for food and space; list some factors that cause changes in population size explain how people affect other populations; compare and contrast the concepts of endangered and extinct; explain how succession repairs a damaged community; and explain how succession changes a community.

- 3.6 The student will be able to list nutrients that help keep bones and muscles healthy; how exercise and rest keep bones and muscles healthy.
- 3.7 The student will be able to explain how the nose prepares air for the lungs; explain how the lungs exchange oxygen for carbon dioxide; explain how muscles help the lungs; explain how oxygen gets to the body cells; explain how cells get rid of carbon dioxide; explain how skin cells get rid of wastes in the form of sweat; explain how urine forms; and list practices that help keep the respiratory and excretory system healthy.
- 3.8 The student will be able to identify the two sexes as God's plan for continuing life; identify children as one of the blessings of marriage; identify the sperm from the father and the egg from the mother as being necessary to start a new life; list female and male sex organs; describe the work of the uterus during pregnancy and delivery; list changes of language, feelings, and customs during adolescence; list body changes for boys and girls during adolescence; and understand the privilege of working with God to create a new live.

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 The student will be able to explain how physical and chemical weathering changes the crust; describe how streams and waves cause erosion and deposition; explain how igneous, sedimentary, and metamorphic rocks form and change; list ways fossils form in sediments; and explain how fossils help people understand changes in the earth's crust.
- 4.2 The student will be able to list sources of water pollution; describe how water resources can be cleaned and protected from future pollution; list sources of air pollution; describe how air can be protected from pollution; list sources of land pollution; describe how land can be cleaned and protected from further pollution; describe how communities can control noise pollution; and describe how planning for future growth protects people.

- 4.3 The student will be able to contrast climate and weather; list the weather factors described by climate; describe how the earth's atmosphere is heated; describe how the curve of the earth's surface and the tilt of the earth affect the heating of the atmosphere; describe how land and water affect temperature and humidity; describe how ocean currents can affect climate; explain how elevation affects temperature; explain how mountains affect precipitation; describe natural events that can change climates; and describe how people can cause changes in climates.
- 4.4 The student will be able to explain how telescopes help people learn about the universe; explain how scientists use satellites and spacecraft; contrast astronomical unit and light year; explain how scientists measure the distance to nearby stars; describe what constellations are; identify the Milky Way as the galaxy containing our solar system; describe how distance from earth affects a star's brightness; and describe how temperature and size affect a star's brightness.

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 Compare present day technologies to those of the past (e.g. refrigerator to ice box; horse drawn carriage to automobile:); and discuss the impact these differences have on the quality of life.
- 5.2 Recognize that technologies consume and generate energy.
- 5.2 Recognize that conservation is a method of preventing depletion of energy.

State Standard 6

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

Classroom objectives

- 6.1 Know that scientific knowledge is subject to modification as new information.

- 6.2 Challenge prevailing theories and new theories lead to looking at old observations in a new way.
- 6.3 Know that the study of the events that led scientist to discoveries can provide information about the inquiry process and its effects.
- 6.4 Know that a change in one or more variables may alter the outcome of an investigation.
- 6.5 Recognize the scientific contributions that are made by individuals of diverse backgrounds, interests, talents, and motivations.