



Shakopee Area Catholic School
Science Standards and Benchmarks
Grade Level: 4
(FOSS™) Minnesota Science Standards

HISTORY AND NATURE OF SCIENCE

Standard: The student will understand how science is used to investigate interactions between people and the natural world.

1. Explore the uses and effects of science in interaction with the natural world.
2. Discuss the responsible use of science.
3. Recognize the impact of scientific and technological activities on the natural world.
4. Recognize and describe how results of similar scientific investigations may turn out differently.
5. Explain that clear communication is an essential part of the process of scientific inquiry.
6. Use numerical data to describe and compare objects and events.
7. Write descriptions of investigations by using observations as support for explanations.
8. Identify better reasons for believing something rather than citing comments.
9. Explain how scientific thinking can be distorted by strong feelings, and explain why and when it is appropriate or necessary to separate emotions from reasoning process.

Standard: The students will participate in controlled scientific investigations.

1. Recognize when comparisons might not be fair because some conditions are not kept the same.
2. Collect, organize, analyze and present data from a controlled experiment.
3. Recognize that evidence and logic are necessary to support scientific understandings.

Standard: The student understands that most natural events occur in comprehensible, consistent patterns.

1. Know that natural events are often predictable and logical.
2. Make predictions based on data from pictures graphs, and line graphs.
3. Know basic patterns, sequences, and cycles occurring in nature.

Standard: The student understands that science, technology, and society are interwoven and interdependent.

1. Understand that people, alone or in groups, invent new tools to solve problems and do work that affects aspects of life outside of science.
2. Know that technologies often have costs, as well as benefits, and can have an enormous effect on people and other living things.
3. Know that data are collected and interpreted in order to explain an event or concept.
4. Construct and analyze graphs, tables, maps, and charts to organize, examine, and evaluate information.
5. Use criteria to understand and analyze the impact of scientific discoveries (for example, determines whether or not scientific claims are backed by sufficient evidence and logical arguments).
6. Know that through the use of science processes and knowledge, people can solve problems, make decisions, and form new ideas.

PHYSICAL SCIENCE

Standard: The student will understand basic electricity and its application in everyday life.

1. Explore simple electrical circuits using components such as wires, batteries and bulbs.
2. Investigate static electricity.
3. Identify objects and materials that conduct electricity and those that are insulators.

Standard: The student will understand that a relationship exists between electricity and magnetism along with its useful applications.

1. Demonstrate how a wire and magnets can be used to generate electric current.
2. Demonstrate how an electric current can make an iron object magnetic.
3. Understand magnets attract and repel each other and certain kinds of other materials.
4. Recognize that some materials are electrical conductors and others are electrical insulators.
5. Demonstrate that magnets attract objects made of iron and a few other substances (called magnetic materials), but they do not attract objects made of most other substances.
6. Investigate and describe that a magnet does not have to touch an object made of magnetic material to exert a force on it.
7. Describe that magnets have poles; unlike poles of two magnets attract each other while like poles repel.
8. Explain how an electrically charged object does not have to touch another object to exert a force - called the electrostatic force – on it.
9. Recognize that there are two types of electrical charge: positive and negative.
10. Explain how the electrostatic force and the magnetic force are not the same thing.

LIFE SCIENCE

Standard: The student will know that living things can be sorted into groups in many ways according to their varied characteristics and structures.

1. Classify plants and animals according to their physical characteristics.
2. Learn that characteristics used for grouping depend on the purpose of the grouping.

Standard: The student will learn to identify properties of plants and animals and to sort and group organisms on the basis of observable properties along with structures of the organisms and learn how some of the structures function in growth and survival.

1. Develop an attitude of respect for life.
2. Gain experience with organisms, both plants and animals.
3. Observe and compare properties of seeds and fruits.
4. Investigate the effect of water on seeds.
5. Observe, describe, and record properties of germinated seeds.
6. Compare different kinds of germinated seeds.
7. Grow plants hydroponically and observe the life cycle of a bean plant.
8. Observe and record crayfish and beetle structures and behavior.
9. Use knowledge of crayfish and beetle life requirements to maintain the organisms in the classroom.
10. Organize data about crayfish territorial behavior.
11. Develop responsibility for the care of organisms.

Standard: Students will know that all organisms need energy and matter to live and grow.

1. Explain that organisms interact with one another in various ways.
2. Observe and recognize that some source of energy is needed for all organisms to stay alive and grow.
3. Describe how energy derived from the sun is used by green plants to produce chemical energy in the form of sugars (photosynthesis) and this energy is transferred along a food chain from producers (plants) to consumers to decomposers.
4. Observe and explain that most plants produce far more seeds than actually grow into new plants.
5. Describe the structures in plants that are responsible for food production, support, water transport, growth, and protection.
6. Describe the many beneficial attributes of plants.
7. Explain how in all environments, organisms grow, die, and decay, as new organisms are produced by the older ones.
8. Recognize that there are microorganisms too small to see with the naked eye, but they can be easily seen with the aid of various kinds of microscopes.

9. Explain how dead plants and animals are the food source for many microorganisms.

Standard: Students will understand that plants and animals have predictable life cycles.

1. Recognize that plants and animals go through predictable life.
2. Describe the life cycle of some living things.
3. Compare and contrast how life cycles vary for different living things.

THE NATURE OF MATTER

Standard: The student understands the basic principles of atomic theory.

1. Know that materials may be made of parts too small to be seen without magnification.
2. Use a variety of tools to observe and study minute details of objects.

ENERGY

Standard: The student recognizes that energy may be changed in form with varying efficiency.

1. Know how to trace the flow of energy in a system.
2. Know that most living things use energy from the Sun to live and grow.
3. Recognize various forms of energy.
4. Know that there are a variety of sources for electricity.
5. Know that most things that emit light also emit heat.
6. Know that most objects that emit light also emit heat.
7. Know ways that energy can be transformed.
8. Know that moving electrical charges produce magnetic forces and moving magnets produce electric currents.
9. Know ways that heat can move from one object to another.

SCIENCE AND TECHNOLOGY

Standard: Students understand that although each of the human enterprises of science and technology has a character and history of its own, each is dependent on and reinforces the other.

1. Demonstrate how scientific tools can be used to gather accurate information for making scientific comparisons of objects and events.
2. Discuss and give examples of how technologies have improved the lives of people.
3. Describe how human beings have made tools and machines to observe and do things that they could not otherwise sense or do at all, or as quickly or efficiently.
4. Make simple and safe electrical circuits with battery and various plugs, sockets, and terminals.

Standard: Students will explore creativity and inventiveness.

1. Use techniques to see details about the world that would otherwise be difficult to observe.
2. Explore the techniques of chromatography, rubbing, carbon printing, and mirror imagery.
3. Solve problems using the techniques of chromatography and carbon printing.
4. Record and compare patterns observed in leaf veins, fingerprints, and ink pigments.
5. Gain experience with texture and pattern in a variety of materials.
6. Express individual and group creativity through open-ended discoveries and inventions.
7. Invent applications to extend the use of specific techniques.
8. Acquire the vocabulary associated with texture and patterns of materials and exercise language in the context of science.