



Shakopee Area Catholic School  
Science Standards and Benchmarks  
Grade Level: 6  
(FOSS™) Minnesota Science Standards

**HISTORY AND NATURE OF SCIENCE**

**Standard: The student will understand that science is a way of knowing about the world that is characterized by empirical criteria, logical argument, and skeptical review.**

1. Distinguish between scientific evidence and personal opinion.
2. Explain why scientists often repeat each other's investigations to be sure of their results.
3. Know that scientists assume that nature is the same everywhere and that it is understandable and predictable.
4. Define scientific facts, laws and theories.

**Standard: The student will understand that scientific inquiry is used in systematic ways to investigate the natural world.**

1. Identify questions that can be answered through scientific investigation and those that cannot.
2. Distinguish among observation, prediction and inference.
3. Use appropriate tools and System International (SI) units for measuring length, time, mass, volume and temperature.

**Standard: Students explore technological design by proposing solutions and evaluating products.**

1. Create scientific models to help them think productively about complex problems.
2. Create models to explain the relationship of parts in systems that are not accessible for example the black box idea.
3. Design and build model carts that respond to a series of engineering challenges.
4. Develop conceptual and physical models

**Standard: The student will know that science and technology are human efforts that both influence and are influenced by society.**

1. Describe the types of questions asked, the products, and the methods of investigation used to distinguish science from technology.
2. Explain why scientists may work in teams or work alone, can collaborate and, at times, compete.

**PHYSICAL SCIENCE**

**Standard: The student will understand that matter is made of small particles and this explains the properties of matter.**

1. Know that there are more than 100 different elements with unique properties.
2. Use evidence to explain that matter is made of small particles called atoms or molecules which are too small to see.
3. Know that the mass of a substance remains constant whether it is together, in parts or in a different state.
4. Describe the states of matter in terms of the space between particles.
5. Distinguish between volume, mass and density.
6. Use characteristic properties of density, melting point, boiling point and solubility to identify and distinguish mixtures and pure substances.
7. Know that atoms are the smallest unit of an element that maintains the characteristics of the element.

**Standard: The student will differentiate between chemical and physical changes.**

1. Define chemical and physical changes.

2. Observe that substances react chemically with other substances to form new substances with different characteristic properties.
3. Express examples and classify substances as mixtures or pure substances.

**Standard: Students investigate basic concepts of chemistry-properties of mixtures and solutions.**

1. Demonstrate dissolving a solid into a solvent and concentration and saturation of a solution, while learning to understand each one behavior.
2. Observe evidence of chemical reactions, evaporation, and crystal formation.
3. Experience with laboratory tools and techniques.
4. Observe solid materials in a liquid.

**EARTH AND SPACE SCIENCE**

**Standard: Describe factors that cause changes to Earth's surface over time.**

1. Comparing constructive and destructive natural processes and their effects on land formations. Examples: destructive-erosion by wind, water, and ice
2. Use stream tables to investigate the variables that influence erosion and deposition of earth materials, which include amount of water, slope and time.
3. Investigate the formation of landforms like valleys, rivers, mountains and deltas.
4. Assemble models of mountains to create a topographic map.

**Standard: Describe Earth's biomes. Examples: aquatic biomes, grasslands, deserts, chaparrals, taigas, tundra.**

1. Identify geographic factors that cause diversity in flora and fauna, including elevation, location, and climate.

**Standard: Students gain experience with environments and living and nonliving environmental factors in terrestrial and aquatic systems.**

1. Organisms contained in the classroom are used to develop the concepts of environmental factor, range of tolerance and optimum condition for survival of populations.
2. Observe how organisms respond to environmental conditions and how they change their environment.
3. Organize data and communicate results.
4. Observe and describe changes in a terrarium over time.
5. Set up and observe animal investigations along with relating the behavior of an animal to the environmental factors.
6. Relate the behavior of an animal to the environmental factor.
7. Experiment to determine the range of tolerance to salinity for brine shrimp.

**Standard: Describe the relationship of populations within a habitat to various communities and ecosystems.**

1. Describe the relationship between food chains and food webs
2. Describe symbiotic relationships

**SCIENTIFIC THINKING AND INQUIRY**

**Standard: Scientific progress is made by asking questions and conducting careful investigations. As a basis for understanding this concept and to address the content in this grade, students should develop their own questions perform investigations. Students:**

1. Give examples of different ways scientists investigate natural phenomena, and identify processes all use, such as collection of relevant evidence, the use of reasoning, the development and testing of hypotheses, and the use and construction of theory to make sense of the evidence.
2. Plan and conduct simple investigations based on student-developed questions that pertain to the content under study and write instructions others can follow in carrying out the investigations.
3. Identify dependent and independent variables in those investigations that have controls. If no controls are used, explain why.
4. Recognize and explain that hypotheses are valuable even if they turn out to be not true, but that many investigations are not hypothesis-driven.

5. Write a report of an investigation that includes the problem to be solved, the methods employed, the tests conducted, the data collected or evidence examined, and the conclusions drawn.
6. Locate information in reference books, back issues of newspapers and magazines, CD-ROMS, and online databases.
7. Draw conclusions based on scientific evidence, and indicate whether information is needed to support a specific conclusion or to discriminate among several possible conclusions.
8. Record and organize information in simple tables and graphs, and identify relationships they reveal. Use tables and graphs as examples of evidence for explanations when writing essays or writing about lab work, fieldwork, etc.
9. Read simple tables and graphs produced by others, and describe in words what they show.
10. Read a topographic map and a geologic map for evidence on the maps.
11. Construct and interpret a simple map.
12. Students will make a representation of their school on a grid map.
13. Observe and describe the types of information represented on a topographic map.
14. Interpret aerial photographs, while relating that information to actual landforms.

### **RESOURCES**

**Standard: Sources of materials differ in amounts, distribution, usefulness, and the time required for their formation. As a basis for understanding this concept, students:**

1. Explain that fresh water is limited in supply and uneven in distribution; describe why it is essential for life as we know it and also for most human activities, including industrial processes.
2. Recognize that fresh water is a resource that can be depleted or polluted, making it unavailable or unsuitable for humans.
3. Recognize that the Earth's resources for humans, such as fresh water, air, arable soil, and trees, are finite.
4. Investigate and describe how pollutants can affect weather and the atmosphere.
5. Explain that recycling, reuse, and the development of substitutes can reduce the rate of depletion of many minerals.

### **LANDFORMS**

**Standard: Students use stream tables to investigate the variables that influence erosion and deposition of earth materials, which include amount of water, slope and time.**

1. Investigate the formation of landforms like valleys, rivers, mountains and deltas.
2. Observe and measure the results of the stream table investigation.
3. Assemble models of mountains to create a topographic map.
4. Observe features of a foam mountain and compare them to a two-dimensional representation.