

Springfield Public Schools
SECONDARY SCIENCE

SIXTH GRADE SCIENCE
COURSE DESCRIPTION

Sixth grade science will provide an opportunity for students to investigate objectives within the subject content areas of physical and earth/space science. Within these areas, students will explore the relevance of science and technology to society. Objectives will be achieved through a hands-on approach to learning and scientific inquiry.

SIXTH GRADE SCIENCE
MAJOR INSTRUCTIONAL GOALS

The intent of the Springfield R-12 Secondary Science Program is to provide a solid science education. Students will:

1. Apply concepts of scientific inquiry.
 - a. Create basic tables and graphs from sets of data. (SC7; 1.8, 2.1)
 - b. Become familiar with units of measurement commonly used in science. (SC7; 1.2, 1.4)
 - c. Observe experiments being performed and discuss what was done and why. (SC7; 1.1, 1.2)
 - d. Use appropriate tools to gather data. (SC7; 1.2, 1.4)
 - e. Apply knowledge of safety rules and regulations by exploring risks associated with natural and chemical hazards. (SC7; 3.1, 4.7)
 - f. Define hypothesis and conclusion and discuss how they are different from each other. (SC7; 1.6, 3.5, 4.1)

2. Demonstrate an understanding of the influence of scientific discovery on society.
 - a. Understand how science and technology can contribute to society. (SC8; 1.10, 4.3)
 - b. Describe how the history of scientific thought spanned many cultures and centuries. (SC8; 1.4, 1.8)
 - c. Examine the use of Earth's natural resources to improve our lives. (SC8; 3.2, 4.7)
 - d. Explore the variety of settings in which scientists and engineers work. (SC8; 2.6, 4.8)
 - e. Discuss limitations of science and technology in solving human problems. (SC8; 1.6, 3.5, 4.1)

3. Investigate and understand the properties and structures of matter.
 - a. State that all matter is made of invisible parts called atoms; diagram and label the nucleus, neutrons, protons and electrons. (SC1; 1.8)
 - b. Identify various changes of matter as physical or chemical. (SC1; 1.3, 1.6)
 - c. Identify the physical properties of a substance including volume, mass, density, boiling point and melting point. (SC1, 1.4)
 - d. Apply the law of conservation of matter to a chemical or physical change of matter. (SC 1; 1.10)

- e. Identify chemical properties of matter. (SC1; 1.3)
 - f. Using appropriate tools, separate a mixture using different methods. (SC1; 1.6)
 - g. Describe the variables that affect dissolving rate and saturation of a solution.(temperature) (SC1; 1.6)
4. Identify sources of energy and their interaction with matter.
- a. Design and create parallel and series circuits. (SC1; 1.3, 1.4, 1.6)
 - b. Compare the efficiency of difference sources of energy for generating electrical power. (SC1; 1.10)
 - c. Predict the conditions required for static electricity. (SC1, 1.3, 3.5)
 - d. Categorize substances as conductors or insulators for electricity and heat. (SC1; 1.3, 1.8, 3.5)
 - e. Investigate how transformations of energy release heat. (SC1; 1.3, 1.6, 3.5)
 - f. Explain how a change of energy such as heat, light, electricity can cause changes in matter. (motion of molecules, change of state of matter) SC1 1.3, 1.6, 3.5
 - g. Using the electromagnetic spectrum, describe the relationship between wavelength, energy, and frequency. (SC1; 1.2, 1.6)
 - h. Explain that heat energy can be transferred by conduction convection or radiation. SC 1; 1.3
5. Investigate relationships between force, motion, and energy.
- a. Graph data to demonstrate the relationship between distance, speed, and time. (SC2; 1.6, 1.8)
 - b. Apply Newton’s three laws of motion to everyday examples. (SC2; 1.6)
 - c. Explain the gravitational force between objects using mass and distance. (SC2; 1.6, 3.5)
 - d. Calculate the amount of work done when a force is used to move an object. (SC2; 1.6, 3.5)
 - e. Interpret and explain the relationship among kinetic energy, potential energy and mechanical advantage. (SC 2; 1.6)
 - f. Illustrate the six simple machines and describe the mechanical advantage of each. (SC2; 1.6, 1.8)
6. Understand the characteristics and changes of the Earth’s lithosphere.
- a. Identify minerals based on their chemical and physical properties. (SC5; 1.2, 1.3)
 - b. Describe the process of plate tectonics. (earthquake, mountain building, volcanoes). (SC5; 1.4, 1.6)
 - c. Explain the rock cycle. (SC5; 1.6)
7. Understand the earth’s physical properties and its relationship with other celestial objects in our solar system.
- a. Illustrate the location of our solar system in the Milky Way galaxy. (SC6; 1.8)
 - b. Compare and contrast the physical properties of different planets. (SC6; 1.2)
 - c. Estimate astronomical distances using scaled drawings. (SC6; 1.8)

- d. Summarize how planetary orbits are affected by gravitational forces from other planets and the sun. (SC6; 1.6)
- e. Explain how changes in the angle from which we view the moon results in lunar and solar eclipses. (SC6; 1.8, 3.1)