

Springfield Public Schools
SECONDARY SCIENCE

EIGHTH GRADE SCIENCE
COURSE DESCRIPTION

Eighth grade science provides students of all ability levels with hands-on learning opportunities to acquire and enhance a solid in-depth foundation of knowledge and skills in the areas of introductory chemical and earth/space science concepts. An integrated approach will be used to investigate and measure the properties of matter and energy, the processes and interactions of Earth's spheres, the composition and structure of the universe, and the motions of the objects within it. Applications to everyday experiences such as weather and environmental concerns will be utilized to engage students in investigative processes and scientific inquiry.

EIGHTH 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. Construct and interpret data, charts, graphs and maps. (SC7; 1.6, 1.8)
 - b. Measure units of the metric system: mass, length, volume, density and temperature with appropriate laboratory equipment. (SC7; 1.2, 1.4).
 - c. Conduct laboratory investigations utilizing the steps of the scientific method. (SC7; 1.2, 1.3)
 - d. Apply knowledge of laboratory safety rules and regulations. (SC7; 3.1, 4.7)
 - e. Apply and use basic principles, formulas, and laws. (SC7; 1.6, 1.8)
 - f. Utilize scientific data to form conclusions and answer questions. (SC7; 1.2, 1.10)

2. Demonstrate an understanding of the influence of technology, scientific discoveries and scientific theories on society.
 - a. Illustrate how social and economic forces, regulations, and economic competition influence the progress of science and technology. (SC8; 1.10, 4.3)
 - b. Investigate and discuss careers and issues in science. (SC8; 1.10, 2.6)
 - c. Analyze the impact of technology on space exploration. (SC8; 1.5, 1.8)

3. Apply the properties and principles of matter and energy.
 - a. Compare the properties of density for different samples of matter. (SC1; 1.6)
 - b. Describe how chemical and physical changes involve energy transfers. (SC1; 1.8, 3.5)
 - c. Organize example of mixtures into heterogenous & homegenous (solution) categories. (SC1; 1.8)
 - d. Compare and contrast the types and concentrations of solute and solvent that affect the rate of solubility, acidity, and viscosity of a solution. (SC1; 1.6, 1.8)
 - e. Construct models to represent elements, compounds, and ions. (SC1; 1.5, 1.8, 2.2, 3.5)
 - f. Construct a model of an electrically neutral atom. (SC1; 2.1, 1.8)
 - g. Construct a model of the Periodic Table of Elements according to their physical properties and chemical reactivity. (SC1; 1.6, 1.8)

- h. Compare and contrast the properties of acid, basic, and neutral solutions.(SC1; 1.6)
4. Analyze processes (such as plate movement, water cycle, and air flow) and interactions of the Earth's biosphere, atmosphere, lithosphere and hydrosphere.
- a. Show the movement of matter and elements through the four spheres as driven by earth's external and internal sources of energy. (SC5; 1.2, 1.6)
 - b. Explain how our weather and climate are caused by organizing information and ideas related to solar radiation, air circulation, and water circulation. (SC5; 1.4, 1.6, 1.8)
 - c. Demonstrate how science technology has enhanced our ability to detect atmospheric changes resulting from the interaction of the earth's systems. (SC5; 1.4, 3.2)
 - d. Evaluate how rock origin, climate, deposition, and biological activities determine physical and chemical composition of the soil. (SC5; 1.6)
 - e. Demonstrate how natural or human activities affect the atmosphere, and how those changes can cause changes in the weather. (SC5; SC8; 1.7, 3.1, 3.2)
 - f. Examine the impact of global plate movement on Earth's topography. (SC5; 1.6, 3.2, 4.1)
 - g. Interpret evidence to give support for the geologic time scale. (SC5; 3.1)
 - h. Apply radiation, conduction and convection to atmospheric and oceanic circulation weather changes. (SC5; 1.1, 1.6)
5. Analyze and show a relationship between the composition and structure of the universe and the motion of the objects within it.
- a. Diagram a star through a cycle of birth, development, and death. (SC6; 1.6, 2.1)
 - b. Analyze mathematical models to show the impact of vast distances in the universe (light years). (SC6; 1.4)
 - c. Explain planetary motion and tides using gravitational laws. (SC6; 1.6, 1.8)