

Science Courses

6th Grade

Physical Science: Energy and Changes in Matter

Students enter the sixth grade with the knowledge of different forms of energy (sound, light, heat, electrical, and magnetic). They have had the opportunity to explore properties of sound and light, observe heat transfer, construct a simple circuit, observe the interaction between magnetic and non-magnetic material, and finally make an electro-magnetic motor. Sixth grade students deepen their understanding of energy through investigations into kinetic and potential energy and the demonstration of the transformation of kinetic energy. Through the investigation of energy transfer by radiation, conduction, or convection, students are introduced to the concept that energy can be transferred while no energy is lost or gained. Students begin to see the connections among light, heat, sound, electricity, and magnetism. They gain an understanding that energy is an important property of substances and that most changes observed involve an energy transfer. Students will understand energy by observing multiple forms of energy transfer and begin to dispel the misconception that energy is linked to fuel or something that is stored, ready to use, and gets consumed.

Sixth grade students also build on their understanding of changes in matter by exploring states in terms of the arrangement and motion of atoms and molecules. They are given the opportunity to design investigations that provide evidence that mass is conserved as it changes from state to state.

Life Science: Organization of Living Things and Ecosystems

The study of life science in the elementary curriculum has introduced students to roles organisms play in a food web, their needs to survive, and the physical and behavioral characteristics that help them survive. The elementary student has a beginning understanding of the dependency of organisms on one another and balance in an ecosystem's food web. Sixth grade students build on their prior knowledge by exploring classifications of organisms based on their source of energy (producers, consumers, and decomposers) and distinguish between ways in which organisms obtain energy. The study of ecosystems at this level includes interactions of organisms within populations, communities, and ecosystems including examples in the Great Lakes region. Students recognize patterns in ecosystems and broaden their understanding from the way one species lives in an environment to how populations and communities interact. They explore how populations can be mutually beneficial and how that relationship can lead to interdependency.

The final course of study in ecosystems for the sixth grader includes biotic and abiotic factors in an ecosystem that influence change. Included is the consequence of overpopulation of a species, including humans. Students explore how humans affect change, purposefully and accidentally, and recognize possible consequences for activity and development.

Earth Science: Solid Earth, Earth in Space and Time

Sixth grade students develop a deeper understanding of the Earth through the exploration of the rock cycle, phenomena that shape the Earth, and Earth's history. In the elementary curriculum, students observed a variety of Earth materials and identified different properties that help sustain life. Sixth grade students explore the formation and weathering of rocks and how different soil types are formed. Their knowledge continues through study of movement of lithospheric plates, major geological events, and layers of the Earth. Students are introduced to the concept of the Earth as a magnet.

7th Grade

Physical Science: Energy, Properties of Matter, Changes in Matter

Seventh grade students continue their exploration into the concept of energy through the exploration of light energy and solar energy effects. Students gain a greater understanding of the role of the sun's warming and lighting of the Earth, and how light energy is transferred to chemical energy through photosynthesis. The transfer of energy is studied through examples of waves (sound, seismic, and water) and how waves transfer energy when they interact with matter.

Their earlier studies of properties of matter emphasized observable physical properties. Seventh grade students explore a more in-depth study of physical properties (boiling point, density, and color) and chemical properties of matter (flammability, pH, acid-base indicators, and reactivity). Students are introduced to organization of the Periodic Table of the Elements and recognize the atom as the smallest component that makes up an element.

Seventh grade students draw upon their knowledge of properties of matter and use evidence to describe physical and chemical change. They recognize that when a chemical change occurs, a new substance is produced and that the new substance has different physical and chemical properties than the original substance. Students describe evidence of chemical change as a change in color, gas formation, solid formation, and temperature change.

Life Science: Organization of Living Things and Heredity

Seventh grade students expand their investigations of living things to include the study of cells. They demonstrate that all organisms are composed of cells and that multi-cellular organisms and single cellular organisms exist in ecosystems. The seventh grade study of cells includes how cells make up different body tissues, organs, and organ systems and are specialized in their functions. Cell division is explored to help the students describe growth and development. Seventh grade students have the fine motor skills and conceptual development to use a light microscope and accurately interpret what they see. This enhances their introduction to cells and microorganisms, establishing a foundation for molecular biology at the high school level.

In the seventh grade content expectations, students expand their knowledge to include how characteristics of living things are passed on through generations, both asexually and sexually. Seventh grade students are able to understand that genetic material carries information. They compare and contrast the advantages of sexual vs. asexual reproduction, and recognize that reproduction is a characteristic of all living things and necessary for the continuation of every species.

Earth Science: Earth Systems and Fluid Earth

The primary focus of the Earth science content expectations understands the relationship between the sun's warming of the Earth, the water cycle, and weather and climate. In the sixth grade Earth science curriculum, students studied the rock cycle and physical and chemical weathering. The seventh grade units of study explore another Earth cycle in the context of the water cycle and the composition of the atmosphere. Students investigate the sun's warming of the atmosphere, land, and water, and how it affects the movement of water through the atmosphere, weather, and climate. Their knowledge of weather goes beyond the more basic observations of weather from the elementary curriculum to include the frontal boundaries, major air masses, and the jet stream. The reflection of their knowledge is applied to how human activities have changed the land, oceans, and atmosphere, and the implications of pollution, climate change, and threatening or endangering species.

8th Grade Earth Science

Required for students in grade 8

Credit: Successful completion of this course will result the opportunity to earn 1 high school Science credit.

Earth Science is a detailed look at our planet and the processes that have shaped it. During the course students will be exposed to important concepts in astronomy, meteorology, geology and physical oceanography.

Students will engage in learning activities and laboratory experiments related to the study of the structure, dynamics and history of the earth. Topics include: the earth as a member of the solar system, interaction with other members of the solar system, structure of the atmosphere, meteorology, geology, glaciers, deserts, seashores, rocks and minerals, plate tectonics, erosive processes, and ocean features and dynamics.