

6th Grade

Science as Inquiry

Traditional laboratory experiences provide opportunities to demonstrate how science is constant, historic, probabilistic, and replicable. Although there are no fixed steps that all scientists follow, scientific investigations usually involve collections of relevant evidence, the use of logical reasoning, the application of imagination to devise hypotheses, and explanations to make sense of collected evidence. Student engagement in scientific investigation provides background for understanding the nature of scientific inquiry. In addition, the science process skills necessary for inquiry are acquired through active experience. The process skills support development of reasoning and problem-solving ability and are the core of scientific methodologies.

Forces and Motion

	Essential Standard	Clarifying Objectives	
6.P.1	Understand the properties of waves and the wavelike property of energy in earthquakes, light and sound waves.	6.P.1.1	Compare the properties of waves to the wavelike property of energy in earthquakes, light and sound.
		6.P.1.2	Explain the relationship among visible light, the electromagnetic spectrum, and sight.
		6.P.1.3	Explain the relationship among the rate of vibration, the medium through which vibrations travel, sound and hearing.

Matter: Properties and Change

	Essential Standard	Clarifying Objectives	
6.P.2	Understand the structure, classifications and physical properties of matter.	6.P.2.1	Recognize that all matter is made up of atoms and atoms of the same element are all alike, but are different from the atoms of other elements.
		6.P.2.2	Explain the effect of heat on the motion of atoms through a description of what happens to particles during a change in phase.
		6.P.2.3	Compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point, and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.

Energy: Conservation and Transfer

	Essential Standard	Clarifying Objectives	
6.P.3	Understand characteristics of energy transfer and interactions of matter and energy.	6.P.3.1	Illustrate the transfer of heat energy from warmer objects to cooler ones using examples of conduction, radiation and convection and the effects that may result.
		6.P.3.2	Explain the effects of electromagnetic waves on various materials to include absorption, scattering, and change in temperature.
		6.P.3.3	Explain the suitability of materials for use in technological design based on a response to heat (to include conduction, expansion, and contraction) and electrical energy (conductors and insulators).

Earth in the Universe

	Essential Standard	Clarifying Objectives	
6.E.1	Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.	6.E.1.1	Explain how the relative motion and relative position of the sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses.
		6.E.1.2	Explain why Earth sustains life while other planets do not based on their properties (including types of surface, atmosphere and gravitational force) and location to the Sun.
		6.E.1.3	Summarize space exploration and the understandings gained from them.

Earth Systems, Structures and Processes

	Essential Standard	Clarifying Objectives	
6.E.2	Understand the structure of the earth and how interactions of constructive and destructive forces have resulted in changes in the surface of the Earth over time and the effects of the lithosphere on humans.	6.E.2.1	Summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.
		6.E.2.2	Explain how crustal plates and ocean basins are formed, move and interact using earthquakes, heat flow and volcanoes to reflect forces within the earth.
		6.E.2.3	Explain how the formation of soil is related to the parent rock type and the environment in which it develops.
		6.E.2.4	Conclude that the good health of humans requires: monitoring the lithosphere, maintaining soil quality and stewardship.

Structures and Functions of Living Organisms

	Essential Standard	Clarifying Objectives	
6.L.1	Understand the structures, processes and behaviors of plants that enable them to survive and reproduce.	6.L.1.1	Summarize the basic structures and functions of flowering plants required for survival, reproduction and defense.
		6.L.1.2	Explain the significance of the processes of photosynthesis, respiration, and transpiration to the survival of green plants and other organisms.

Ecosystems

	Essential Standard	Clarifying Objectives	
6.L.2	Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.	6.L.2.1	Summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred within food chains and food webs (terrestrial and aquatic) from producers to consumers to decomposers.
		6.L.2.2	Explain how plants respond to external stimuli (including dormancy and forms of tropism) to enhance survival in an environment.
		6.L.2.3	Summarize how the abiotic factors (such as temperature, water, sunlight, and soil quality) of biomes (freshwater, marine, forest, grasslands, desert, Tundra) affect the ability of organisms to grow, survive and/or create their own food through photosynthesis.