

Course/Grade Level: Sixth Grade Life Science Curriculum

S.6.1 Students will demonstrate a working knowledge of science using inquiry, history, and the nature of science.

Students will...

- S.6.1.1 ▲ identify questions that can be answered through scientific investigations. (5-7.1.1.1)

Instructional Example: generate testable questions to investigate.

- S.6.1.2 ▲ design and conduct scientific investigations safely using appropriate tools (including microscopes), mathematics, technology, and techniques to gather, analyze, and interpret data. (5-7.1.1.2)

Instructional Example: components may include hypothesis, independent and dependent variables and constants, materials, procedures, collecting and analyzing data, and conclusions.

- S.6.1.3 ▲ identify the relationship between evidence and logical conclusions. (5-7.1.1.3)

Instructional Example: check data to determine: Was the hypothesis supported? Did this design work? How could this experiment be improved? What other questions could be investigated?

- S.6.1.4 ▲ communicate scientific procedures, results, and explanations. (5-7.1.1.4)

Instructional Example: present a report of their investigations

- S.6.1.5 ▲ evaluate the work of others to determine evidence, which scientifically supports or contradicts the results, identify reasoning or conclusions that go beyond evidence and/or are not supported by data. (5-7.1.3.2)

Instructional Example: explain how a reasonable conclusion is supported and analyze evidence and data that supports or contradicts various theories.

- S.6.1.6 ▲ recognize that new knowledge leads to new questions and new discoveries, replicate historic experiments to understand principles of science, and relate contributions of men and women to the fields of science. (5-7.7.2.1)

Instructional Example: discuss discoveries that replaced previously held knowledge such as the safety of saccharine or Pluto's status as a planet. Researches the contributions of men and women in science: i.e. Galileo, Newton, Pasteur, Wegner, Mendel, Dawrin, Einstein, and the Curies.

S.6.2 Students will comprehend the development of cells and the cell theory.

Students will...

- S.6.2.1 ▲ evaluate the cell theory: that all organisms are composed of one or more cells, cells are the basic unit of life, and that cells come from other cells. (5-7.3.1.1)

Instructional Example: observe plant and animal cells by using a microscope.

- S.6.2.2 ▲ relate the structure of cells, organs, tissues, organ systems, and whole organisms to their functions. (5-7.3.1.2)

Instructional Example: identify human body organs and functions, maps human body systems and functions, compare plant and animal cells; compare and contrast prokaryotes and eukaryotes.

- S.6.2.3 compare organisms of single cells with organisms that are multi-cellular. (5-7.3.1.3)

Instructional Example: compare major parts and functions of a single-cell organism to a multi-cellular organism.

- S.6.2.4 conclude that breakdowns in structure or function may be caused by disease, damage, heredity, or aging. (5-7.3.1.4)

Instructional Example: compare lung capacity of smokers with that of non-smokers and graph the results.

S.6.3 Students will demonstrate knowledge of heredity and reproduction.

Students will...

- S.6.3.1 ▲ differentiate between asexual and sexual reproduction of organisms. (5-7.3.2.1)

Instructional Example: compare the reproduction of a unicellular organism to a multi-cellular organism.

- S.6.3.2 relate how hereditary information of each cell is passed from one generation to the next. (5-7.3.2.2)

Instructional Example: use Punnett squares to show passing of traits from parents to offspring. Use a coin toss to predict probabilities of traits being passed on; compare mitosis and meiosis.

- S.6.3.3 infer that the characteristics of an organism result from heredity and interactions with the environment. (5-7.3.2.3)

Instructional Example: choose an organism, research its characteristics, infer if these characteristics result from heredity, environment, or both.

S.6.4 Students will distinguish and explain the different aspects of ecology.
Students will...

- S.6.4.1 ▲ comprehend that internal and/or environmental conditions affect an organism's behavior and/or response in order to maintain and regulate stable internal conditions to survive in a continually changing environment. (5-7.3.3.1)
Instructional Example: select a variable to alter the environment of an organism and observe the effects on an organism, movement of particles into and out of a cell: osmosis/diffusion, endocytosis and exocytosis, active and passive transport.
- S.6.4.2 recognize that the survival of all organisms require the ingestion of materials, the intake and release of energy, growth, release of wastes and responses to environmental change. (5-7.3.3.2)
- S.6.4.3 ▲ recognize that all populations living together (biotic resources) and the physical factors (abiotic resources) with which they interact, compose an ecosystem. (5-7.3.4.1)
Instructional Example: participate in a field study examining the living and nonliving parts of a community.
- S.6.4.4 relate how limiting factors determine the carrying capacity of an ecosystem. (5-7.3.4.2)
Instructional Example: change variables such as wheat crop yields, mice, or a predator, and chart the possible outcomes.
- S.6.4.5 ▲ trace the energy flow from the sun (source of radiant energy) to producers (via photosynthesis-chemical energy) to consumers and decomposers in food webs. (5-7.3.4.3)
- S.6.4.6 ▲ investigate the effects of human activities on the environment and analyze decisions based on the knowledge of benefits and risks. (5-7.6.2.1)
Instructional Example: evaluate the benefits of burning fossil fuels to meet energy needs against the risks of increased air pollution, etc.

S.6.5 Students will examine how species are classified and relate how evolution can contribute to biological diversity.

Students will...

- S.6.5.1 conclude that species of animals, plants, and microorganisms may look dissimilar on the outside but have similarities in internal structures, developmental characteristics, chemical processes, and genomes. (5-7.3.5.1)

Instructional Example: use a field guide or dichotomous key to identify organisms

- S.6.5.2 ▲ recognize that adaptations of organisms (changes in structure, function, or behavior that accumulate over successive generations) contribute to biological diversity. (5-7.3.5.2)

Instructional Example: compare characteristics of birds such as beaks, wings, and feet, with how a bird behaves in its environment.

- S.6.5.3 ▲ associate extinction of species with environmental changes and insufficient adaptive characteristics. (5-7.3.5.3)

S.6.6 Students will create an individual nutrition and exercise model.

Students will...

- S.6.6.1 ▲ identify individual nutrition, exercise, and rest needs based on science and use a scientific approach to thinking critically about personal health, lifestyle choices, risks, and benefits. (5-7.6.1.1)

Instructional Example: evaluate the risks and benefits of foods, medicines, and personal products; compare the nutritional and toxic properties of foods