

Biology 1

<p>Standard #1 Scientific Investigation Students applied the process of scientific investigation and design, conducted, communicated about, and evaluated investigation.</p>
<p>Standard #2 Physical Science Students understood common properties, forms and changes in matter and energy.</p>
<p>Standard #3 Life Science Students understood the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.</p>
<p>Standard #4 Earth and Space Science Students understood the processes and interactions of Earth's systems and the structure and dynamics of Earth and other space objects.</p>
<p>Standard #5 Scientific Method Students understood that the nature of science involves a particular way of building knowledge and making meaning of the natural world.</p>

Description

This course is designed to provide an introduction to biology and scientific methodology. It begins with a study of the conditions and the unique properties of organisms which set living things apart from nonliving things. Studies range from molecular and cellular biology to reproduction and genetics leading to the study of organ variation and methods of scientific classifications. A series of laboratory investigations are incorporated into the course which emphasizes problem solving strategies, the use of laboratory equipment, and an introduction to technology.

Time Allocation
 Ninety minutes daily

Texts/References
Biology, Glencoe, 2009

Themes /Topics
 Cell Biology
 Classification of Life Forms
 Evolution
 Ecology
 Genetics
 Metabolic Processes

Assessments
 Lab Performance
 Presentation Evaluations
 Project Evaluations
 Teacher constructed tests and quizzes

Grades and Achievement Levels
 Grades are based on assignments/worksheets, class participation, projects, labs, quizzes and tests.

Essential Learning Biology 1

**Standard # 1
Scientific Investigation**
Students applied the process of scientific investigation and design, conducted, communicated about, and evaluated investigation.

- Hypothesis and research

**Standard # 2
Physical Science**
Students understood common properties, forms and changes in matter and energy.

- Atoms, elements, and compounds and their relation to physiological functions in processes such as respiration, circulation, and digestion
- Carbohydrates, proteins, nucleic acids and lipids structures and functions
- Aerobic and anaerobic processes
- Passive and active transport processes

**Standard # 3
Life Science**
Students understood the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

- Inheritance patterns in genetics
- Punnett square analysis and ratios in determining genotypes and phenotypes
- Microbiology studies with Monerans, Protists, and the comparison of plant and animal cellular structures
- Ecological and Evolutionary comparisons

**Standard # 4
Earth and Space Science**
Students understood the processes and interactions of Earth's systems and the structure and dynamics of Earth and other space objects.

- Not assessed in this course

**Standard # 5
Scientific Method**
Students understood that the nature of science involves a particular way of building knowledge and making meaning of the natural world.

- Incorporation of technology, such as power point, microscopes, and DNA fingerprinting, throughout science labs and projects

Expectations: Biology 1

<p style="text-align: center;">Standard #1</p> <ol style="list-style-type: none"> 1. Asked questions and stated hypotheses, using prior scientific knowledge to help guide their development 2. Created and defended a written plan of action for a scientific investigation 3. Selected and used appropriate technologies to gather, process, and analyze data and reported information related to an investigation 4. Identified major sources of error or uncertainty within an investigation (for example, particular measuring devices and experimental procedures) 5. Constructed and revised scientific explanations and models, using evidence, logic and experiments that included identifying and controlling variables 6. Communicated and evaluated scientific thinking that lead to particular conclusions 7. Recognized and analyzed alternative explanations and models 8. Explained the difference between a scientific theory and a scientific hypothesis 	<p style="text-align: center;">Standard #2</p> <ol style="list-style-type: none"> 1. Learned how chemical structures are related to the functions of proteins, lipids, carbohydrates, and nucleic acids 2. Differentiated between active and passive transport systems and their importance in physiology 3. Compared the processes of photosynthesis, glycolysis, and cellular respiration 	<p style="text-align: center;">Standard #3</p> <ol style="list-style-type: none"> 1. Described cellular organelles and their function 2. Differentiated among levels of organization and their roles within the whole organism 3. Explained human body functions in terms of interacting organ systems composed of specialized structures that maintain or restore health 4. Compared and contrasted characteristics of and treatments for various types of medical problems 5. Used examples to explain the relationship of structure and function in organisms 6. Described the pattern and process of reproduction and development in several organisms 7. Compared and contrasted the purpose and process of cell division (mitosis) with the production of sex cells (meiosis) 8. Cited examples of how some traits can be inherited while others are due to the interaction of genes and the environment 9. Described how DNA serves as the vehicle for genetic continuity and the source of genetic diversity upon which natural selection can act 10. Described how mutation, natural selection, and reproductive isolation can lead to new species and explain the planet's biodiversity 11. Described the general structure and function of the gene (DNA) and its role in heredity and protein synthesis 12. Calculated the probability that an individual will inherit a particular single gene trait 	<p style="text-align: center;">Standard #4</p> <ul style="list-style-type: none"> • Not assessed in this course 	<p style="text-align: center;">Standard #5</p> <ol style="list-style-type: none"> 1. Demonstrated the interrelationships between science and technology 2. Explained the use of technology in an occupation 3. Used microscopes properly with accuracy and precision
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