

Advanced Placement Biology

Unit One: Chemical and Cellular Basis of Life

Curriculum Materials Utilized: AP College Board curriculum standards

Unit Overview: This unit encompasses basic biochemistry and organic chemistry, which provide the foundation for understanding the emergent properties of cellular life.

Essential Questions:

- How do the structures of the four major organic compounds relate to their functions?
- What are the structures and functions of the smallest unit of life, the cell?
- What are the details of essential cell processes, such as, membrane regulation, reproduction, energy transfer, and cell communication?

Laboratory Component: Enzyme characteristics, Diffusion and Osmosis, Mitosis observations

Unit Two: Genetics and Gene Regulation

Curriculum Materials Utilized: AP College Board curriculum standards

Unit Overview: This unit will address the genetic basis of life. DNA structure and protein synthesis will be investigated on a molecular level. Emphasis is placed on genetic and molecular technology and modern advances in genetic engineering.

Essential Questions:

- How does the structure of DNA and RNA relate to its function in protein synthesis?
- How does the DNA self replicate?
- What are the techniques used in investigating genetic and protein properties?

Laboratory Investigations: Gel Electrophoresis and Bacterial Transformation

Unit Three: Evolution, Diversity of Life and Ecology

Curriculum Materials Utilized: AP College Board curriculum standards

Unit Overview: This unit discusses the major underlying theme of Evolution. A survey of taxonomy and relationships among the major kingdoms and phyla is explored and emphasizes the evolutionary relatedness of all living organisms.

Essential Questions:

- What are the components of Darwin's theory of Natural Selection?
- How is the Hardy-Weinberg equation utilized to explain the effects of evolution on a population?
- What are the major characteristics of the kingdoms? What are the evolutionary relationships among the phyla of the plant and animal kingdom?
- How do organisms interact in the biosphere?

Laboratory Investigation: Lab Walk (live specimens of phyla), Genetic Drift and Hardy Weinberg Activities, Behavior lab

Unit Four: Comparative Anatomy and Physiology of Plants and Animals

Curriculum Materials Utilized: AP College Board curriculum standards

Unit Overview: Major life processes are explored and applied to whole organism anatomy and physiology. The physiological processes of digestion, transport, circulation, hormonal and nervous control, and movement are discussed and compared in plants and animals.

Essential Questions:

- What structures and processes do organisms utilize to achieve the basic needs of all life?
- How do organisms obtain nutrients?
- How do multicellular organisms communicate and transport substances?
- How do multicellular organisms use nervous, endocrine and cellular communication to control life processes?

Lab Investigations: Plant Transpiration, Behavior Lab, Daphnia Circulation, Case studies