

Options EHS Biology B 2020		Scope and Sequence
Unit	Lesson	Objectives
Genetics		
	Population Genetics	<p>Describe the effect of genetics on the growth rate and carrying capacity of a population.</p> <p>Evaluate the effects of events on gene flow.</p> <p>Skills used: interpreting data, understanding cause and effect</p>
	Lab: Mouse Genetics (Two Traits)	<p>Demonstrate how alleles are passed independently of one another.</p> <p>Use the laws of inheritance to describe how two separate traits are inherited in an organism.</p> <p>Science Practice: Evaluate data to formulate a conclusion.</p>
	Introduction to Heredity	<p>Examine the contributions made by Gregor Mendel to the field of genetics.</p> <p>Explain how traits are inherited.</p> <p>Distinguish dominant and recessive alleles.</p> <p>Differentiate between genotype and phenotype.</p>
	Introduction to Genetics	<p>Explain the importance of Gregor Mendel to the field of genetics.</p> <p>Describe the role of nucleic acids in transmitting genetic information.</p> <p>Science Practice: Give examples of how hypotheses lead to new experimental methods.</p>
	Applied Genetics	<p>Describe the process for selective breeding.</p> <p>Analyze a pedigree to identify desired traits for breeding.</p> <p>Science Practice: Evaluate the impact of science and technology on society.</p>

Unit Lesson**Objectives**

Advances in Genetics

Compare the processes of selective breeding, cloning, and genetic engineering.

Describe the impact of genetic technologies on society and the environment.

Examine the use of gene therapy to treat disease.

Acquired and Inherited Traits

Distinguish between inherited and acquired traits.

Discuss the influence of genetics and the environment on heredity.

Science Practice: Assess how science and society impact each other.

Test

Evolution of Life

Darwin's Theory

Summarize the main points of Darwin's theory.

Summarize the major concepts of natural selection.

Explain how natural selection acts as a mechanism of evolution.

Science Practice: Describe how scientific investigations lead to new scientific questions.

Factors Affecting Genetic Variation

Give examples of how environmental factors affect genetic variation and influence natural selection.

Describe genetic drift and gene flow as mechanisms of evolution.

Science Practice: Predict trends and outcomes based on a given set of data.

Lab: Natural Selection

Identify natural selection as a mechanism for the evolution of a population.

Science Practice: Decide whether specific questions can be answered using scientific investigation.

Unit Lesson**Objectives**

Hardy-Weinberg Principle

Identify the conditions that are necessary for a population to be in Hardy-Weinberg equilibrium.

Use the Hardy-Weinberg equation to predict the frequency of genotypes in a population given the frequency of phenotypes.

Science Practice: Describe how scientific investigations lead to new scientific questions.

Factors Affecting Biological Diversity

Explain how new or varied species originate via natural selection.

Examine how directional, disruptive, and stabilizing selection affect biological diversity.

Science Practice: Judge claims made by scientific explanations, data, or arguments.

Biogeographic Isolation

Explain the concept of biogeographic isolation.

Analyze how new species are formed by reproductive and geographic isolation.

Analyze the relationship between biogeographic isolation and the theory of evolution.

Science Practice: Give examples of how hypotheses lead to new experimental methods.

Biological Evidence and the Fossil Record

Distinguish scientific evidence that supports the theory of evolution.

Assess the comparative anatomies among organisms.

Describe how the fossil record shows common ancestry between organisms.

Science Practice: Explain the role of scientific argumentation in evaluating the validity of data, claims, hypotheses, and observations.

Evolutionary Relationships

Analyze the relationships among organisms based on a variety of shared characteristics.

Unit Lesson**Objectives**

Interpret evolutionary relationships among organisms on a cladogram.

Explain how understanding evolutionary history impacts classification of organisms.

Science Practice: Describe various ways evidence can be interpreted or explained.

Unit Test

Taxonomy

Methods of Classification

Explain the purpose of biological taxonomy.

Describe how organisms are classified.

Explain reasons why systems of classification may change.

Science Practice: Organize data using specific grouping methods.

The Kingdoms

Distinguish the six kingdoms of living organisms.

Summarize the levels of biological classification.

Compare characteristics of taxonomic groups.

Science Practice: Organize data using specific grouping methods.

Types of Plants

Summarize the origin and evolution of land plants.

Distinguish ways that plants are grouped.

Differentiate between gymnosperms and angiosperms.

Science Practice: Organize data using specific grouping methods.

Plant Structures

Identify the three types of plant tissue.

Unit Lesson**Objectives**

Relate the structures of major plant organs and tissues to their functions.

Describe the interactions among plant systems that allow transport, reproduction, and response.

Science Practice: Give examples of how research affects science, society, and the environment.

Protists and Fungi

Characterize the three common types of protists.

Distinguish between the five phyla of fungi.

Relate the structures found in protists and fungi to their functions.

Science Practice: Show how scientific evidence can affect societal decisions.

Bacteria

Characterize three common forms of bacteria.

Compare modes of bacterial reproduction.

Explain how bacteria infects other organisms.

Science Practice: Examine the contributions of scientists from various scientific disciplines.

Viruses

Compare the structure of a virus to a cell.

Describe how the structure of a virus contributes to its ability to cause infection.

Differentiate between the lytic and lysogenic cycles of viral reproduction.

Science Practice: Use scientific evidence to support an argument.

Identifying Unknown Organisms

Describe the purpose for using a dichotomous key.

Explain the process of identifying an organism using a dichotomous key.

Science Practice: Distinguish between and give examples of observation and inference.

Unit Lesson**Objectives**

Unit Test

Human Body I

Types of Tissue

Differentiate the four types of human tissue.

Explain the functions of each type of human tissue.

Describe the role of skin.

Science Practice: Give examples of how research affects science, society, and the environment.

The Human Skeleton

Differentiate between the axial and appendicular skeleton.

Describe the functions of the skeletal system.

Illustrate bone markings and joint types.

Science Practice: Compare and contrast different scientific disciplines.

Muscle Structure and Function

Illustrate the major structures and functions of the muscular system.

Differentiate skeletal, smooth, and cardiac muscles by structure and function.

Describe the physiological process of a muscle contraction.

Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.

The Endocrine and Exocrine Systems

Illustrate the different structures of the endocrine and exocrine systems.

Explain the functions of the endocrine and exocrine systems.

Describe the role of hormones in maintaining homeostasis.

Science Practice: Conduct research using a variety of sources.

Unit Lesson**Objectives**

The Central Nervous System

Illustrate the major structures and functions of the central nervous system.

Examine the different parts of the brain and spinal cord, and their functions.

Science Practice: Describe various ways evidence can be interpreted or explained.

The Peripheral Nervous System

Illustrate the major structures and functions of the peripheral nervous system.

Identify the roles of sensory neurons, interneurons, and motor neurons.

Identify the major functions associated with the sympathetic and parasympathetic nervous systems.

Science Practice: Analyze how new technologies and experiments affect previous scientific explanations.

Unit Test

Cumulative Exam

Cumulative Exam Review

Cumulative Exam