

Teaching Unit: *What is Biology*

Essential Understandings

Life Characteristics

Stimulus/Response

Adaptations/Survival

How Scientific Methods are Used to Study Living Things

Technology Changes in Science Over Time.

Sub Topic: *Methods of Biology*

Knowledge and Skills

Identify benefits of studying Biology

Summarize characteristics of life

Compare different scientific methods

Compare and contrast quantitative and descriptive research

Explain why science and technology can't solve all problems

Teaching Unit: *Principles of Ecology*

Essential Understandings

Cycles of matter and explain their interrelationship.

Factors that affect population size.

impact of human and other activities on ecosystems.

Sub Topic: *Nutrition and Energy Flow*

Knowledge and Skills

Distinguish between biotic and abiotic factors

Compare and Contrast different levels of biological organization

Trace the path of energy and matter in an ecosystem

Analyze how nutrients are cycled in the biosphere

Teaching Unit: *Communities and Biomes*

Essential Understandings

Biological Organizational Levels

Ecological Succession

Biomes

Sub Topic:

Knowledge and Skills

Explain how limiting factors and ranges of tolerance affect distribution of organisms

Sequence the stages of ecological succession

Identify the major limiting factors that affect distribution of terrestrial biomes.

Compare and contrast various biomes.

Teaching Unit: ***Population Biology***

Essential Understandings

Population Growth

Factors that Affect Population Growth

Issues Related to Human Population Growth

Sub Topic: ***Human Population Growth***

Knowledge and Skills

Compare and contrast exponential and linear population growth

Predict effects of environmental factors on population growth

Relate population characteristics to population growth

Compare and contrast human population growth characteristics and their effects.

Teaching Unit: ***Biological Diversity and Conservation***

Essential Understandings

Biological Diversity

Threatened & Endangered Species

Extinction

Sub Topic: ***Vanishing Species Conservation of***

Knowledge and Skills

Explain biodiversity and its importance to an ecosystem

Relate various threats to loss of biodiversity

Describe strategies used in conservation biology including protecting threatened and endangered species

Teaching Unit: ***View of a Cell***

Essential Understandings

Eukaryotic and Prokaryotic Cells

Structure and Function of Plasma Membrane

Relate structure of Cell Organelles to their Function

Sub Topic: ***The Plasma Membrane***

Knowledge and Skills

Identify the main ideas of the cell theory

Explain how cell's plasma membrane functions

Understand the structure and function of the parts of an eukaryotic cell

Compare and contrast the structures of plant and animal cells

Teaching Unit: ***Cellular Transport and the Cell Cycle***

Essential Understandings

Movement of materials into and out of a cell.

Somatic Cell Reproduction - Mitosis

Controls of the Cell Cycle.

Abnormal Cell Cycle (Cancer)

Sub Topic:

Knowledge and Skills

Explain how diffusion, passive and active transport are important to cells

Predict the effects of hypertonic, hypotonic and isotonic solution on a cell

Sequence the events of the cell cycle (Mitosis)

Distinguish between the events of a normal cell cycle and an abnormal cell cycle that can result in cancer

Teaching Unit: ***Genetics - Mendel's Laws***

Essential Understandings

Analyze the results of Gregor Mendel in his experiments

Predict possible offspring of genetic crosses by using Punnett squares.

(Monohybrid cross, dihybrid cross)

Sub Topic:

Knowledge and Skills

Predict the possible offspring of a genetic cross using a Punnett square

Explain Mendel's Laws

Explain Genetic Engineering

Debate the principles of genetically engineered food.

Identify the basic concepts of genetics

Be able to perform monohybrid and dihybrid crosses using Mendel's laws of segregation and independent assortment

Teaching Unit: ***DNA and Genes***

Essential Understandings

Structure and Function of DNA

DNA Reproduction

DNA Mutations

Sub Topic:

Knowledge and Skills

Analyze the structure of DNA

Determine how the structure of DNA enables it to reproduce itself accurately

Relate the concept of the gene to the sequence of nucleotides in DNA

Sequence the steps involved in protein synthesis

Categorize the different kinds of mutations that can occur in DNA

Compare the effects of different kinds of mutations on cells and organisms

Teaching Unit: ***History of Life***

Essential Understandings

Different types of fossils.

Major Events of the Geologic Time Scale

Sub Topic:

Knowledge and Skills

Identify different types of rocks and fossils and how they are formed

Summarize the major events of the Geologic Time Scale

Teaching Unit: ***Natural Selection and Adaptations***

Essential Understandings

Darwin's theory of natural selection

Structural and Physical Adaptations over time

Sub Topic:

Knowledge and Skills

Summarize Darwin's Theory of natural selection

Explain how the structural and physiological adaptations of organisms relate to natural selection

Teaching Unit: ***Primate Adaptations***

Essential Understandings

Primate Adaptations

Human Ancestry

Sub Topic:

Knowledge and Skills

Recognize the adaptations of primates

Compare and contrast the diversity of living primates

Summarize the major anatomical changes in hominids over time
