

General Biology/Survey/AP Biology

I. Enduring Understanding:

Organisms interact and transfer energy and matter in a dynamic web of life. (1-8)

Essential Questions:

How do matter and energy flow through ecosystems?

How do communities and populations develop and change?

How are organisms ordered in the biosphere?

Student Outcomes: Students will:

- A. Understand that energy flows through ecosystems and matter cycles.
 - 1. Diagram the levels of organization
 - 2. *Distinguish between biotic and abiotic factors*
 - 3. *Differentiate between relationships in the ecosystems*

- B. Realize that populations change in predictable models
 - 1. *Draw the major cycles of matter and identify the processes*
 - 2. *Trace the history and impact of human population growth*
 - 3. *Interpret and predict changes in populations overtime*

II. Enduring Understanding:

The cell is the fundamental unit of structure and function in all organisms. (1, 2, 5, 6, 8, 9)

Essential Questions:

What do all cells have in common?

How do prokaryotic and eukaryotic cells differ?

How do substances move in and out of cells?

How do cells capture and utilize energy?

What is the structure and function of organic compounds in organisms?

Student Outcomes: Student will:

- A. Understand all organisms use the same inorganic molecules for life
 - 1. *Identify inorganic molecules that are necessary for life*
 - 2. *Describe how macromolecules are built and how they function together*
 - 3. *Generalize how buffers and enzymes maintain homeostasis*

- B. Know all cells have common structures and function
 - 1. Be able to locate a cell under the microscope
 - 2. *Identify notable cell structures and their functions*
 - 3. *Distinguish between prokaryotes and eukaryotes*
 - 4. *Predict how and why substances move into and out of cells*
 - 5. List, describe, and recognize the characteristics of life

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- C. Understand that cells gather and / or utilize energy
 - 1. *Memorize the equation for photosynthesis and respiration*
 - 2. *Contrast the light and dark reactions of photosynthesis*
 - 3. *Describe the production of ATP in anaerobic and aerobic respiration*

III. Enduring Understanding:

Reproductive processes deliver genetic information from parent to offspring. (1-4, 7-9)

Essential Questions:

How do cells reproduce?

What are the principles of Mendelian genetics?

What are the inheritance patterns of human genetics?

What is the mechanism for inheritance of traits?

Student Outcomes: Students will:

- A. Understand the cell cycle and what precipitates reproduction.
 - 1. *Identify the different parts of the cell cycle.*
 - 2. *Draw the phases of mitosis in both animal and plant cells.*
 - 3. *Identify the differences between mitosis and meiosis.*
 - 4. List the sources of genetic variation and the differences between sexual and asexual reproduction.
 - 5. *Determine why meiosis is a reduction division.*

- B. Know that characteristics of organisms are inherited.
 - 1. *Apply the laws that were developed from Mendel's work.*
 - 2. *Explain sex determination.*
 - 3. *Describe changes in chromosomes and the effects on inheritance.*
 - 4. *Identify the structure and DNA and RNA.*
 - 5. *Describe the difference between replication, transcription, and translation.*
 - 6. Discuss the mechanisms for chromosome changes.
 - 7. *Outline the development of our knowledge of DNA structure and function.*

IV. Enduring Understanding:

Organisms have and continue to adapt to survive in an ever-changing environment. (1-9)

Essential Questions:

What mechanism promotes change in organisms?

What evidence supports that life on earth has changed?

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Student Outcomes: Students will:

- A. Understand the process for change in populations over time.
 - 1. *Identify the evidences for the development of the earth.*
 - 2. *Explain Darwin's theory for change*
 - 3. *Discuss the ancestry and traits of hominids.*
 - 4. Name the criteria for modern taxonomy.

V. Enduring Understanding:

Human application of technology has allowed us to manipulate living systems. (1-4, 7-9)

Essential Questions:

How do humans solve problems?

How do advances in technology affect day to day life?

Student Outcomes: Students will:

- A. Understand how the science method and the science way of thinking are used to solve problems.
 - 1. *Utilize the science method to solve problems.*
 - 2. Identify equipment and techniques used by biologists.
 - 3. *Recall the history and development of microscopes*
 - 4. *Explain how biotechnology affects our lives today and in the future.*