

Science Biology

Properties and Principles of Matter and Energy

1. The student will be learn and understand the chemical and physical changes involved in the nitrogen, water, carbon dioxide cycle, and decomposition involved in the food web of an ecosystem.

ASSESSMENT: Identify the steps of each cycle and explain how this is important to the balance of an ecosystem

Characteristics and Interactions of Living Organisms

1. The student will recognize that cells will increase in size and number, and that they will differentiate and become specialized in structure and function during and after embryonic development.
2. The student will identify factors that affect differentiation and growth of cells. (moisture and temp)
3. The student will recognize and describe the parts of both animal and plants cells, their function and differentiation and their function to the survival of the cell.

ASSESSMENT: The student will identify the parts of both a plant cell and animal cell and their function to the survival and growth of the cell

4. The student will understand and explain how similarities are used to classify groups of living organisms.
5. The student will explain how new species are placed in certain taxa based on physical and genetic characteristics.
6. The student will explain the inter-relationship of photosynthesis and cellular respiration and the factors that affect these processes.

ASSESSMENT: Provided by resource material using matching, word bank, multiple choice and short answer.

Cells Carry out Chemical Transformation that use Energy for the synthesis or breakdown of organic Compounds

- 1. The student will summarize how energy transfer occurs during photosynthesis and respiration and how it is stored and release through the use of ATP.**
 - 2. The student will understand the structure of compounds and their role in living systems.**
 - 3. The student will explain how the DNA code determines the sequence of aminos acids necessary for protein synthesis.**
- The student will recognize the importance of proteins in the cells structure and function.**

ASSESSMENT: The student will explain why ATP is the universal currency of all living organisms and how the ATP cycle is important to the organism.

Cellular activities and responses can maintain stability internally while external condition are changing

- 1. The student will explain the importance of a semi permeable membrane to the transport of molecules.**
- 2. The student will be able to differential the molecules that move through a semi-permeable membrane.**
- 3. The student will explain the importance of water to cells. (buffer for temperature, use for chemical reactions, provides hydration)**

ASSESSMENT: Draw a cell showing a cell in a hypotonic solution, a hypertonic solution and isotonic solution. Show which direction the water will flow and how it affects the size and solute concentration inside and outside of the cell.

There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes

- 1. The student will recognize that reproduction can occur both asexually and sexually and the advantages and disadvantages of each regarding the population of a species.**
- 2. The student will understand that all living organisms have genetic material (DNA) that carries hereditary information.**
- 3. The student will describe chromosomes as components of cells that carry hereditary information from one cell to a daughter cell and from parents to offspring during reproduction.**
- 4. The student will demonstrate an understanding of the difference between meiosis and mitosis cell division.**

5. The student will understand that there is a heritable variation within every species of organism.(genetic variations and mutations)
- 6.The student will use the principles of Mendelian inheritance to construct a Punnett square to determine the occurrence of dominant and recessive genes

ASSESSMENT: Draw a Punnett square using dominant trait (hanging earlobes HH) and recessive (non-hanging earlobes hh) to determine the offspring ratio of dominant to non-dominant genotype and phenotype.

Organisms are Interdependent with one another and their environment

1. The student will explain how populations living together within a community with one another interact with each other and with their environment in order to survive and maintain a balanced ecosystem.
2. the student will demonstrate an understanding of the interaction between predator and prey and the different symbiotic relationships in an ecosystem.
3. The student will that living organisms have the capacity to produce populations of infinite size, but environmental resources limit their growth.
4. All organisms in a community affect changes in their environment that affect their ecosystems that affect all other organisms in that community.
5. Energy flows through the ecosystem in the form of a food or energy chain and web and food and energy is recycled through an ecosystem.

ASSESSMENT: Draw a food chain using grass, oak trees, foxes, bobcats, snakes, squirrels, rabbits, mice and hawks. Identify each species as a producer, primary consumer, or secondary consumer. Describe the effect of the loss of the rabbit population affects the other organisms of the food web.

Genetic Variations sorted by the natural selection process explains evidence of Biological Evolution

1. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and the fossil record.
- Reproduction is essential to the continuations of every species.
3. Natural selection is the process of sorting individuals by their ability to survive and reproduced within an ecosystem.

Assessment: Explain how natural selection and genetics variations are interrelated to produces changes in a species in an ecosystem.

Earth's materials are limited natural resources affected by human activity

1. The student will predict how global and local changes in the environment will affect the organisms in that environment.

ASSESSMENT: How might global warming affect polar bears in a polar ecosystem?