

Biology 1610/1615/AP Biology Learning Objectives "I Can Statements"

I can.....

- Describe the difference between a food chain and a food web.
 - Categorize members of an ecosystem in their proper trophic levels.
 - Name and explain the five levels of biological organization studied by ecologists, including examples.
- Describe the flow of energy between trophic levels and explain the efficiency of energy transfer between trophic levels (10% rule)
- Identify and describe the main biological processes responsible for energy transfer/exchange in the biosphere.
- Analyze the benefits and energy investments for an organism that demonstrates a specific life strategy.
- Describe and understand how chemical elements move through ecosystems in biogeochemical cycles (The Water Cycle, Carbon Cycle, Nitrogen Cycle and Phosphorus Cycle).
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- Describe the important elements of diversity and relate each to human welfare.
 - Examine each of the following human caused environmental changes: nutrient enrichment, toxins in the environment, global climate change and ozone depletion
- Compare and contrast environmentalism and ecology, including the roles and limitations of each.
 - Analyze the value of sustainable development for both improving human lives and conserving biodiversity.
 - Describe the difficulty associated with both understanding and improving human-caused environmental issues.
- Describe how interactions between organisms and the environment affect the distributions of species.
 - Describe how relationships among organisms (predation, parasitism, competition, commensalism, mutualism etc.) add to the complexity of biological communities.
 - Define ecological niche and analyze what happens when niches overlap.
- Distinguish between density dependent and density independent limiting factors.
 - Explain what a community is and how diversity of species characterize biological communities.
 - Evaluate different strategies used by populations to diminish competition. (Competitive exclusion, opportunism, resource partitioning, territoriality, etc.)

<ul style="list-style-type: none"> • Compare and contrast primary and secondary succession and make predictions about future successional stages. • Discuss the impacts of disturbances to communities.
<ul style="list-style-type: none"> • Understand the characteristics that define a population. • Know the four factors that contribute to population growth. • Compare and contrast patterns of growth (exponential, logistic, boom and bust). • Engage in methods of measuring or estimating population size. • Use data and graphical representations to analyze and predict population trends. • Define an ecosystem, including the concepts of abiotic and biotic factors. • Describe the "biodiversity crisis" and the major threats to biodiversity.
<ul style="list-style-type: none"> • Recognize and give the defining characteristics of the major terrestrial and aquatic biomes. • Describe the concept of biomagnification/bioaccumulation in an ecosystem including specific examples.
<ul style="list-style-type: none"> • Analyze the changes, and contributing factors to changes in human population growth
<ul style="list-style-type: none"> • Describe the organization of an atom • Explore the variations of natural elements by describing ions and isotopes of each element • Describe the various ways in which elements can be bonded • Describe why Carbon is the basic building block for many macromolecules.
<ul style="list-style-type: none"> • Explain the requirement for chemistry in the understanding of biology and metabolism • Explain the differences between organic and inorganic chemistry as they relate to the components of life • Utilize the strength of these bonds to explore the potential uses of these bonds in the context of the ingredients of life • Utilize the strength of these bonds to explore the potential uses of these bonds in the context of the ingredients of life • Diagram hydrolysis and dehydration reactions to illustrate the synthesis and digestion of macromolecules. • Compare and contrast the structure and function of four types of macromolecules. • Use modeling to relate the specific sequence of amino acids to the overall protein shape. • List the four nucleotides of DNA; explain the base pairing pattern. • Relate the structure of a molecule to its function.
<ul style="list-style-type: none"> • Describe the unique properties of water
<ul style="list-style-type: none"> • Describe the ways that animals maintain homeostasis • Explain the structures and processes of how animals exchange materials with their environments • Explain the effects of hormones on animal systems

- **Explain the immunity (defense) system of animals**