AP Bio Summer Assignment
2016
Mrs. Oswald

Welcome to AP Biology! I look forward to a great year. Due to the large volume of content we have to cover, your summer assignment will be to read the Ecology Unit--Chapters 52-56 in Campbell Biology, 10th Edition--and complete the following.

Support each of the following main ideas in *4-6 sentences*. Use *many* of the provided chapter terms in your answer, but do not feel that you need to use them all. Please *highlight the terms* that you choose to use in your responses.

Your answers should be typed in *Google docs* using *Times New Roman, 12-pt font, double-spaced,* and will be Google-checked for original wording upon submission. Please share them with me at lkoswald74@gmail.com by the first day of school. You should have approximately 8-10 pages of typed summary by the end of the summer. Please see the example and video references at the end of this document.

We will start the school year with a 5-day ecology review followed by an ecology assessment before beginning a new unit.

Chapter 52: An Introduction to Ecology and the Biosphere

- Main Ideas
    - Earth's climate varies by latitude and season and is changing rapidly.
    - The structure and distribution of terrestrial biomes are controlled by climate and disturbance.
    - Aquatic biomes are diverse and dynamic systems that cover most of Earth.
    - Interactions between organisms and the environment limit the distribution of species.

- Chapter Terms
    - climate, microclimate, macroclimate, tropics, abiotic, biotic, biome, climograph, ecotone, canopy, disturbance, tropical dry forests, tropical rain forests, deserts, savannas, chaparral, temperate grasslands, temperate broadleaf forests, northern coniferous forest, tundra, photic zone, aphotic zone, pelagic zone, abyssal zone, benthic zone, benthos, detritus, thermocline, turnover, oligotrophic lakes, eutrophic lakes, littoral zone, limnetic zone, wetlands, estuary, headwater stream, turbid river, coral reef, deep-sea hydrothermal vents, dispersal

Chapter 53: Population Ecology

- Main Ideas
    - Biological processes influence population density, dispersion, and demographics.
    - The exponential model describes population growth in an idealized, unlimited environment.
    - The logistic model describes how a population grows more slowly as it nears its carrying capacity.
    - Life history traits are products of natural selection.
    - Many factors that regulate population growth are density dependent.
- Chapter terms
    - Population, density, dispersion, mark-recapture method, immigration, emigration, territoriality, demography, life table, cohort, survivorship curve, reproductive table, exponential model, zero population growth, exponential population growth, carrying capacity, logistic growth model, logistic population growth, Allee effect, life history, semelparity, iteroparity, k-selection, r-selection, density dependent, density independent, population dynamics, metapopulation, demographic transition, age structure, ecological footprint

Chapter 54: Community Ecology

- Main Ideas
    - Community interactions are classified by whether they help, harm, or have no effect on the species involved.
    - Diversity and trophic structure characterize biological communities.
    - Disturbance influences species diversity and composition.
    - Biogeographic factors affect community diversity.
    - Pathogens alter community structure locally and globally.
- Chapter terms
    - Interspecific interactions, interspecific competition, competitive exclusion, ecological niche, resource partitioning, character displacement, predation, aposematic coloration, cryptic coloration, herbivory, symbiosis, parasitism, parasite, host, endoparasites, ectoparasites, mutualism, commensalism, facilitation, species diversity, species richness, Shannon diversity, biomass, invasive species, trophic structure, food chain, food web, energetic hypothesis, dominant species, keystone species, nonequilibrium model, disturbances, intermediate disturbance hypothesis, ecological succession, primary succession, secondary succession, evapotranspiration, species-area curve, zoonotic pathogens, vector

Chapter 55: Ecosystems and Restoration Ecology

- Main Ideas
    - Physical laws govern energy flow and chemical cycling in ecosystems.
    - Energy and other limiting factors control primary production in ecosystems.
    - Energy transfer between trophic levels is typically only 10% efficient.
    - Biological and geochemical processes cycle nutrients and water in ecosystems.
    - Restoration ecologists return degraded ecosystems to a more natural state.
- Chapter terms

    - Law of conservation of mass, primary producers, primary consumers, secondary consumers, tertiary consumers, decomposers/detritivores, detritus, primary production, net primary production, gross primary production, net ecosystem production, limiting nutrient, eutrophication, production efficiency, turnover time, bioremediation, biological augmentation

Chapter 56: Conservation Biology and Global Change

- Main Ideas
    - Human activities threaten Earth's biodiversity.
    - Population conservation focuses on population size, genetic diversity, and critical habitat.
    - Landscape and regional conservation help sustain biodiversity.
    - Sustainable development can improve human lives while conserving biodiversity.
- Chapter terms
    - Conservation biology, endangered species, threatened species, ecosystem services, introduced species, extinction vortex, minimum viable population, effective population size, movement corridors, biodiversity hot spots, urban ecology, critical load, biological magnification, greenhouse effect, assisted migration, sustainable development

Example

Main idea--Carbohydrates serve as fuel and building materials.

Terms--monomer, monosaccharides, glycosidic linkage, disaccharides, polysaccharides, starch, glycogen, cellulose, chitin

A carbohydrate is a large biological molecule that is made of many small molecules called monomers. The monomers that make a carbohydrate are simple sugars, or monosaccharides. Glucose is the monosaccharide that is used during cellular respiration to yield ATP. Two monosaccharides can join via a glycosidic linkage and form a disaccharide. Polysaccharides can be used as energy storage molecules, like starch in plants or glycogen in animals, or as structural molecules, like cellulose in plant cell walls or chitin in arthropod exoskeletons.

Helpful Videos

Videos to watch by Hank Green (brother of author John Green). They are informative, easy to watch, and relate well to the information covered in the reading. He is not a Christian, though, so be warned that he makes statements about the role of humans in the biosphere that are contrary to Scripture.

Population Ecology

https://youtu.be/RBOsqmBQBQk?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Community Ecology I

https://youtu.be/GxE1SSqbSn4?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Community Ecology II

https://youtu.be/mFDiiSqGB7M?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Ecological Succession

https://youtu.be/mFDiiSqGB7M?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Ecosystem Ecology

https://youtu.be/mFDiiSqGB7M?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Conservation and Restoration Ecology

https://youtu.be/Kaeyr5-O2eU?list=PL8dPuuaLjXtNdTKZkV_GiIYXpV9w4WxbX

Nutrient Cycling

https://youtu.be/2D7hZpIYlCA

https://youtu.be/leHy-Y_8nRs

Have a great summer and please contact me with questions at lkoswald74@gmail.com

:) Mrs. Oswald