

Apes chapter 3 questions

[Environment](#), [Earth](#)



Chapter 3 Reading Questions: 1. CoreCase Study: " Have you thanked your insects today? "- Explain why insects are significant. Many of the earth's plant species depend upon insects to pollinate them. Carnivorous insects, such as the praying mantis, control the ' pest' insect population. 2. What percentage of the species on this planet consists of insects? Animals? Plants? 53% are insects; 20% are other animals; 18% are plants. 3. Give three examples of how we benefit from microbes.

Soil bacteria convert nitrogen gas into usable forms for plants; they decompose wastes into nutrients we use; they help produce various foods such as bread, cheese, wine, beer, and tofu. 4. What percentage of the biomass on this planet accounts for microbes? 90% of earth's living mass. 5. Define the four spheres of the earth. The atmosphere is the thin membrane of air around the planet. The troposphere is the air layer about 11 miles above sea level. The stratosphere lies above the troposphere between 11-30 miles; it filters out the sun's harmful radiation.

The hydrosphere consists of earth's water, found in liquid water, ice, and water vapor. The lithosphere is the crust and upper mantle of the earth's soil. It contains nonrenewable fossil fuels, minerals, and soil, and renewable soil chemicals needed for plant life. The biosphere includes most of the hydrosphere, parts of the lower atmosphere and upper lithosphere. All parts of the biosphere are interconnected. 6. Describe the three interconnected factors that life depends on. The flow of high-quality energy; the cycling of matter or nutrients; gravity. 7.

Describe what happens to all of the solar radiation that reaches the earth. Solar energy flowing through the biosphere warms the atmosphere,
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evaporates and recycles water, generates winds, and supports photosynthetic life. 8. Is the greenhouse effect a positive or negative issue for life on earth? Explain why. It is a positive effect because without it, the earth would be too cold to support most forms of life. 9. Explain the following terms: abiotic, biotic, range of tolerance. Abiotic consists of non-living components such as water, air, nutrients, and solar energy.

Biotic consists of biological components such as producers, consumers, and decomposers. Each population in an ecosystem has a range of tolerance to variations in its physical and chemical environment. 10. Explain how limiting factors can control population size. Too much or too little of any abiotic factor can limit or prevent growth of a population, even if all other factors are at or near the optimum range of tolerance. 11. What factors usually limit terrestrial populations? On land, precipitation and soil nutrients are often limiting factors. 12. What factors usually limit aquatic populations? In water, temperature, sunlight, nutrient availability, dissolved oxygen content, and salinity are limiting factors. 13. What is the overall chemical reaction for photosynthesis? $6\text{CO}_2 + 6\text{H}_2\text{O} (+ \text{light energy}) \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$. 14. What is the overall chemical reaction for respiration? $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + 36 \text{ATP}$ 15. Why are decomposers so significant to an ecosystem? They recycle the nutrients that make life possible throughout the ecosystem. 16.

Why is biodiversity one of our most important renewable resources? Biodiversity provides us with natural resources, natural services, pleasure, and keeps the balance of the food web. 17. Describe 4 key components of biodiversity. Functional diversity includes the biological and chemical

processes such as energy flow and matter recycling needed for the survival of species, communities, and ecosystems. Ecological diversity includes the variety of terrestrial and aquatic ecosystems found in an area or on the earth.

Species diversity includes the number of species present in different habitats. Genetic diversity includes the variety of genetic material within a species or population. 18. What are the five major causes of species decline? Habitat destruction and degradation, invasive species, pollution, and human population growth. 19. Summarize two approaches to sustaining biodiversity. The ecosystem approach protects populations of species in their natural habitat by preserving sufficient areas of habitats in different biomes and aquatic systems.

The species approach protects species from premature extinction by identifying endangered species and protecting their critical habitats. 20. What trophic level do decomposers consume from? Decomposers process detritus from all trophic levels. 21. What form of energy is transferred from one organism to another? Stored energy in the tissues of the organism. 22. Why would the earth be able to support more people if we ate at a lower trophic level? The energy intake would be higher because there is less loss of energy. 23.

Why are there rarely more than 4 or 5 trophic levels within an ecosystem? Because the food web would not be able to sustain that great of an energy loss in successively higher levels. 24. What is the significance of net primary productivity? NPP measures how fast producers can provide the food needed by other organisms in an ecosystem. 25. What might happen to us and to

other consumer species as the human population grows over the next 40-50 years and per capita consumption of resources such as food, timber, and grassland rises sharply?

What are the three ways to prevent this from happening? We will end up pushing other species to extinction and reduce the biodiversity in earth. To prevent this, we can prevent population growth, find renewable energy sources, and consume food locally and at a lower trophic level.

26. Consider the diagram on page 67 (figure 3-22). Explain why desertification is so significant of an issue and relate that to the significance of net primary productivity. Dry land ecosystems are already such fragile ecosystems, and many of these delicate ecosystems have the most net productivity.

7. Describe the four types of soil horizons. The surface litter layer (O horizon) is the top layer and consists of freshly fallen undecomposed or partially decomposed leaves, twigs, crop wastes, animals waste, fungi, and other organic material. It is normally brown or black. The topsoil layer (A horizon) is a porous mixture of the partially decomposed bodies of dead plants and animals, called the humus and inorganic materials such as clay, silt, and sand. The B and C horizons (subsoil and parent material) contain most of a soils inorganic material and lies on bedrock.

8. How does color relate to the quality of the topsoil? The color of the topsoil suggests how useful a soil is for growing crops. Dark brown or black soil is rich in organic matter and nitrogen. Gray, bright yellow or red topsoils are the opposite.

29. What are the significant properties of soil? Soil texture: particle size of components.

30. How do humans impact the hydrological cycle? We alter the water cycle by withdrawing large amounts freshwater, clearing vegetation, and eroding

soils, polluting surface and underground water, and contributing to climate change. 1. Be able to diagram the entire Carbon cycle. See below 32. What is the significance of burning fossil fuels on the C cycle? Adds more carbon to the air. 33. How are Carbon and Nitrogen used by living organisms? Carbon and nitrogen make up organisms and are used in respiration by them. 34. What two natural processes convert nitrogen gas in the air to a usable form? Nitrogen fixation, Nitrification. 35. How is the C & N Cycle affected by humans? We add large amounts of nitric oxide in the air and we add fertilizers to the water and soils.