

## APES – Review Book - Activity – CHAPTER 2

**READ the Chapter 2 Review** and complete the following WS. Please study the summarized content to help you understand the **KEY Terminology** and the **KEY concepts**.

The responses are hand generated (in PEN). You don't need to print this document, you just need the lined paper to respond to the questions.

- I. Copy the **Key Terms** and define them all. Make sure to memorize the terms. *(There will be quiz on each Chapter Review)*
- II. Answer the **Comprehension Questions and/or Concept Topics**:

### 1. Introduction to Ecology:

A good portion of Environmental Science is understanding ecology and the relationships among organisms AND the influence of human society on them.

- A. Define: **Ecology, biotic/abiotic factors, and biosphere**. Make sure to review the hierarchy levels and organization of life.
- B. Define: **Chemical Cycles (cycling of nutrients)**

### 2. DEFINE: **Force of Gravity** and the impact it has on Earth.

### 3. **The Earth has FOUR Major System DEFINE them all:**

- A) Atmosphere
  - a. Troposphere
    - i. Greenhouse effect
    - ii. Ozone layer
  - b. Stratosphere
- B) Hydrosphere
- C) Geosphere
- D) Biosphere
  - a. Biomes

### 4. DEFINE: **Ecosystem Structure**, after understanding the parts of an ecosystem, EXPLAIN the difference between the terms of **range of tolerance** and **the optimum range**. Use examples to show the difference.

### 5. Define **Energy Flow** – using your knowledge about producers, consumers, decomposers, and detritivores, **DRAW a Food Pyramid** incorporating the three trophic levels and drawing red arrows symbolizing energy flow.

- A) compare the photosynthesis vs. chemosynthesis
- B) explain aerobic respiration vs. fermentation
- C) **MEMORIZE ALL** four equations

### 6. **PRACTICE naming three of each representative:**

Define and give examples:

- A) producers
- B) Primary consumer

- C) Secondary consumer
- D) Tertiary consumer
- E) Detritivores
- F) Decomposers

7. **COMPARE** the food chains provided in the review book, which one is more complex and why?

When speaking about ecological efficiency the term defines the amount of usable chemical energy that moves from trophic level to trophic level in a form of biomass. After studying the explanation of the energy movement in the pyramid, **WRITE** a short simple summary of what happens to the 90% of the energy?

8. **DEFINE** the Gross primary productivity and net primary productivity.

9. **BioGeoChemical Cycles** – study pg. 87 – 92 attentively, define each cycle and provide negative human impact on each:

- a) Hydrological cycle
- b) carbon cycle
- c) Nitrogen cycle
- d) Sulfur cycle
- e) Phosphorus cycle

10. Identify what ecosystem **diversity** is and what are the main components of it.

A) **DEFINE: biodiversity**

B) **DEFINE: natural capital and species diversity**

a. **species richness**

b. **species evenness**

C) **EXPLAIN** why biodiversity decreases with the shift from tropical to polar zones?

D) **EXPLAIN** why species richness and evenness are important factors of primary and secondary successions?

E) **DEFINE primary succession** and **pioneering species** forming soil

F) **DEFINE secondary succession** and explain the steps of forest formation. What is **climax community**?

11. **DEFINE and EXPLAIN:** Why does natural selection and genetic variability influence biodiversity of an ecosystem?

12. **DEFINE and EXPLAIN: Natural selection** and what are the tools natural selection uses. Explain why it is the population that evolves not the individual?

13. **Natural Selection** is impacted by multiple factors. Two most profound events are

A) **Geologic Events**

B) **Climate Events** – define both, with the examples

C) **Speciation** – it is an outcome of the environmental changes by the means of geographical and reproductive isolation. According to the knowledge you have, describe both using examples of the species which went through that speciation event.

14. Changes to biodiversity are driven by geological and climatic factors, where some of the species will not survive and some organisms will become extinct.

DEFINE types of extinctions: **mass and background extinction**

Define: **niche** – formation new habitats, ecosystems

15. **DEFINE all categories of species** according to their lifestyle, provide two examples each

- A) generalist
- B) specialist
- C) native/nonnative
- D) invasive
- E) keystone
- F) Indicator
- G) founder

15. **Community Interactions** fill in the variety of niches each habitat/ecosystem has. To understand the proper dependence and relationships within the ecosystem, you need to know the types of interactions happening inside various ecosystems/habitats.

Using habitat and ecosystem interchangeably is INCORRECT. Define each and **EXPLAIN** the difference between the **HABITAT** and **ECOSYSTEM**.

16. Another important feature of community interactions is **interspecific competition**, which is the main drive for the continuous change in the ecosystems.

- ✓ **DEFINE ALL** the levels and types, giving one example each!
- ✓ **INTERACTIONS to DEFINE:** predation, parasitism, mutualism, commensalism

17. DEFINE the methods of **predation** and provide an example for each type (4 examples in total)

18. **Natural Selection** is a driving force of evolution. Predator and Prey are only as successful as their counterparts allow them to be.

- **EXPLAIN** through an example how the **co-evolution** works.
- **EXPLAIN** through an example how chemical **warfare** works, as a form of evolution.

19. Habitats of the organisms should offer basic survival resources, BUT that is not the case in every situation. **Stress factors** are an important tool of adaptation and survival rate. Identify and describe how the **niche overlap** and **resource partitioning** promotes survival rates of the species. How is the concept of the **competitive exclusion principles** forcing the species to adapt to a new condition, and if they don't what would be the outcome.

20. Population dynamics and growth are influenced by its size, density, distribution, and age structure. Based on these factors the populations have the following distributions – **clumped, random, uniform** – DEFINE them all and provide one example for each.

21. DEFINE: **age structure**

22. DEFINE: **types of population growth, and carrying capacity (K)**

23. According to the reproductive rate, limited resources, and/or parental care there are two types of organisms:

- DEFINED: **k-selected species**
- DEFINED: **r-selected species**