

Unit 8 Formative Assessment – Biomes & Ecology

1. The following factors are *biotic* or *abiotic*. Create two categories and put each factor in the correct category and **EXPLAIN** why you categorized them the way you did: *water, food, microorganisms, air, plants, animals, soil, temperature, precipitation, sunlight*

BIOTIC (Living)

- Plants**
- Animals**
- Bacteria**
- Microorganisms**
- * **Food**

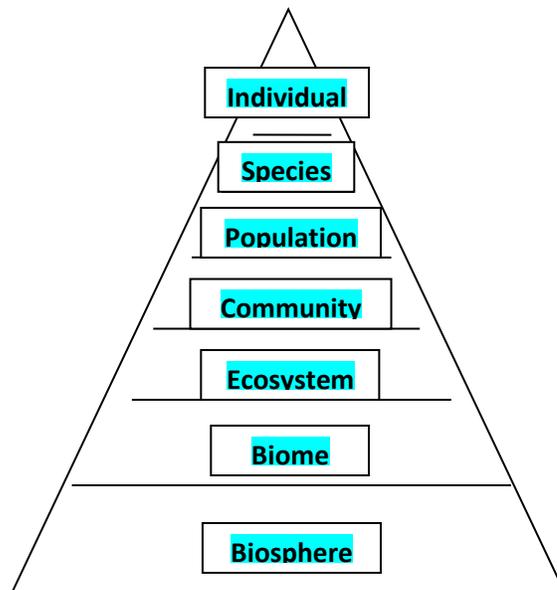
ABIOTIC (Non-Living)

- **Water**
- **Soil**
- **Air**
- **Precipitation**
- **Sunlight**
- **Temperature**
- * **Food**

2. What do we call the study of organisms and their interaction with the environment? (hint: it is an ology)
Then write the definition in your own words.

**** Ecology – The study of biotic and abiotic factors and its interaction/footprint on the environment**

3. Using the trophic (ecological) pyramid below, label each of the spaces with the following terms showing the flow from **ONE at the TOP to MANY at the BOTTOM**: *biosphere, community, population, biome, individual, ecosystem, species*



4. What is the process that allows a producer (autotroph) to make its own food/energy from the Sun?
Write the **EQUATION** for this process.

**** Photosynthesis: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$**

**** Inputs (reactants) → carbon dioxide, water, solar energy**

**** Outputs (products) → sugar (glucose), oxygen**

5. What do we call the process where an organism takes in oxygen and releases carbon dioxide?
Write the **EQUATION** for this process.

**** Aerobic (Cellular) Respiration:**

$\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{Energy}$

**** Inputs (reactants) → sugar (glucose), oxygen**

**** Outputs (products) → carbon dioxide, water, energy**

6. * TRUE or FALSE: A group of individuals of the same species in a given area at the same time is called a genus.
Write correct answer if false.

**** False → Population**

- * TRUE or FALSE: A population with low genetic diversity is more likely to survive major environmental changes.
Explain your answer if false.

**** False → High Genetic Diversity**

**** Genetic Diversity: Greater DIVERSITY allows populations to adapt to changing environments due to passed on character traits**

- * TRUE or FALSE: Mutations in DNA, natural selection pressures, and extinction level events over time create environments that are rich in variations of plant and animal species. We call this process

**** True → Biodiversity (Genetic Diversity)** ____. (HINT: what kind of diversity is this?)

7. Which kinds of changes are **most likely** to develop new species or to cause species to go extinct? Choose from **changes in the geosphere** (volcanic activity or plate tectonics, the Earth being hit by a meteor), **changes in the atmosphere** (daily weather pattern changes), or **changes in the environment**. **EXPLAIN YOUR ANSWER.**

**** Changes in the environment**

**** Changes in predator/prey relationship**

**** Changes in food and habitat resources**

**** Change in niches (roles)**

8. Give an example of where a new species is introduced to an area by accident.

**** Non-Native (Invasive) Species**

**** Zebra Mussels - Great Lakes**

**** Burmese Pythons - Florida Everglades**

**** Fire Ants - North Carolina**

9. Identify the two (2) types of biodiversity **AND** give a description for each.

**** Genetic Diversity – Variety of genes/traits within a single population (of a single species)**

**** Species Richness – Number (relative abundance) of a species within a single ecosystem**

10. List **three (3)** non-native (invasive) species in North Carolina. Indicate how each impacts the environment.

**** NC's Non-Native (Invasive) Species:**

A. Fungi (Chestnut Blight)

B. Insects (Fire Ant)

C. Plants (Japanese Honeysuckle)

**** Effects:** Decreases native species population; ecological, economical, environmental disturbances

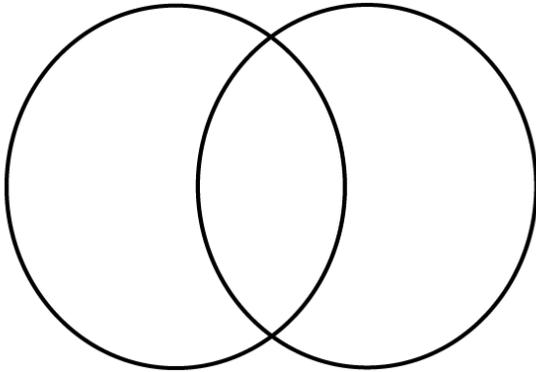
**** How:** Introduced naturally or accidentally

**** Characteristics:** Adaptive, competitive, & successful reproduction

11. The most important factor in determining a biome found in a particular area is _____.

- a. Magnetic fields
- b. Plants and animals
- c. **Climate**
- d. Soil

12. Compare and contrast *native* and *non-native (invasive) species*.



**** Similar: May coexist within the same ecosystem**

**** Native: Original to a community; Occupy specific habitats; Carry specific niches; Have natural predators**

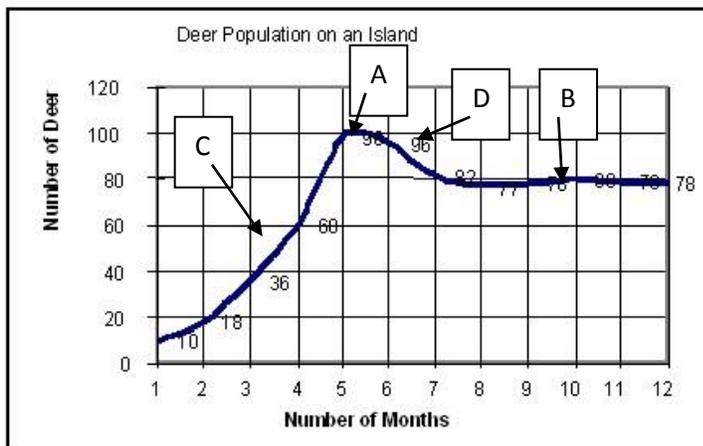
**** Non-Native: Lives outside its normal distribution range; Introduced deliberately or accidentally; Highly adaptive to environmental changes; High reproduction rate**

- 13.
- a. **Food Web** is a complex system of interlocking food chains that show the transfer of food energy.
 - b. **Producers (autotrophs)** are able to make its own food energy with energy from the Sun through a process called **photosynthesis**.
 - c. A **habitat** is where a species lives, whereas **niche** is its ecological role in that environment.
 - d. **Species richness** describes the number (relative abundance) of species within a single ecosystem that contributes to its biodiversity.

14. Complete the following table:

BIOME	LOCATION	CLIMATE (HOT, COLD, RAINY, DRY)	SOIL (RICH OR POOR)	PLANTS (GIVE EXAMPLES)	ANIMALS (GIVE EXAMPLES)
Tropical Rain Forest	Near the equator	HOT/RAINY	POOR, BUT RICH TOPSOIL	BAMBOO	KING COBRA
Coniferous (Boreal) Forest	Northern latitudes	COLD/RAINY	POOR	SPRUCE TREES	GRAY WOLF
Temperate Deciduous Forest	Mid latitudes	ALL OF THE ABOVE	RICH	WHITE OAK	AMERICAN EAGLE
Hot Desert	Mid latitudes	HOT/DRY	POOR	CACTUS	COYOTE
Temperate Grassland (Prairie)	Mid latitudes, center of continents	ALL OF THE ABOVE	RICH	GRASS	PRAIRIE DOGS
Savannah	Mid latitudes, center of continents	ALL OF THE ABOVE	VERY DIVERSE	ELEPHANT GRASS	LION
Arctic Tundra (Frozen Desert)	High northern latitudes	COLD/DRY	POOR	LOW SHRUBS	SNOW OWL

15. Label the points "A-D" with the following terms: *population stabilized at carrying capacity, exponential growth, exceeded carrying capacity and declining, peak population*



**** A: Peak population**

**** B: Population stabilized at carrying capacity**

**** C: Exponential growth**

**** D: Exceeded carrying capacity and declining**

16. Explain what happens to a population with high genetic diversity when it encounters environmental changes.

**** Decreases at first, but then recovers as population slowly increases again**

17. Food webs are a more accurate depiction of feeding relationships compared to food chains because _____.

a. Many animals that comprise the links in a food chain are migratory

b. Organisms almost always eat, and are eaten by, many different organisms

c. Food chains always lose trophic levels over time

d. None of the above

18. Fill in the blanks with the following terms: *natural resources, minerals, limiting factor, plants/animals, abiotic, population, deaths, births, soil, resources, limits, carrying capacity*

A **population** grows when the number of births is greater than the number of deaths. It

shrinks, if **deaths** exceed **births**. For a population to grow there must be enough

resources and no major **limits**. A population can shrink either because of biotic or

abiotic limits.

When number of births equals number of deaths, the population is at its **capacity** for that

habitat. Every stable population has one or more factors that limit its growth. A **limiting factor**

determines the carrying capacity for a species: nutrient, space, and water availability are examples.

A population uses natural resources. **Natural resources** are materials or substances

such as **minerals, plants/animals**, water, and fertile **soil** that occur in nature and

can be used for economic gain.