

Introduction to Ecology Worksheet

Investigating Our Living Planet: Ecology is the scientific study of interactions among organisms and between organisms and their environment. Earth's organisms live in the biosphere. All life on Earth and all parts of the Earth in which life exists, including land, water, and the atmosphere make up the biosphere. Ecologists may study different levels of ecological organization:

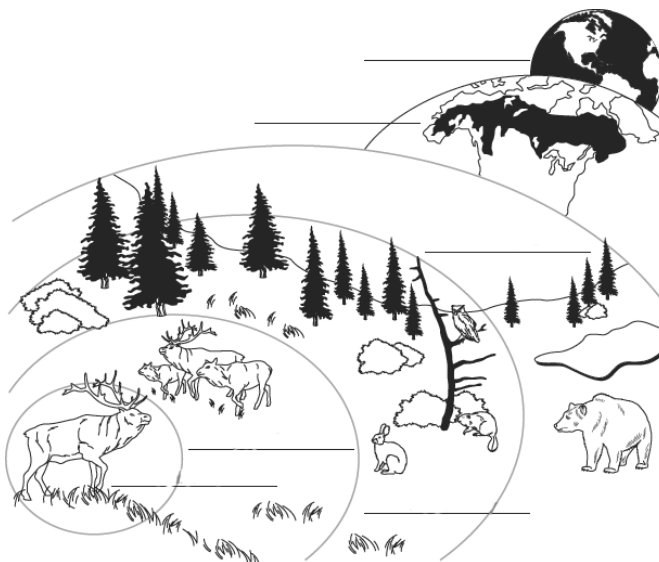
- Individual organism
- Population – An assemblage of individual organisms that belong to the same species and live in the same area
- Community – An assemblage of different populations that live together in an area
- Ecosystem – All organisms that live in a particular place together with their physical environment
- Biome – A group of ecosystems that have similar climates and organisms
- Biosphere – Regions of the surface, atmosphere and hydrosphere that living organisms occupy

1. What is ecology?

2. What does the biosphere contain?

3. Label the following picture with the following vocabulary words:

Population, Community, Organism, Biosphere, Biome, Ecosystem



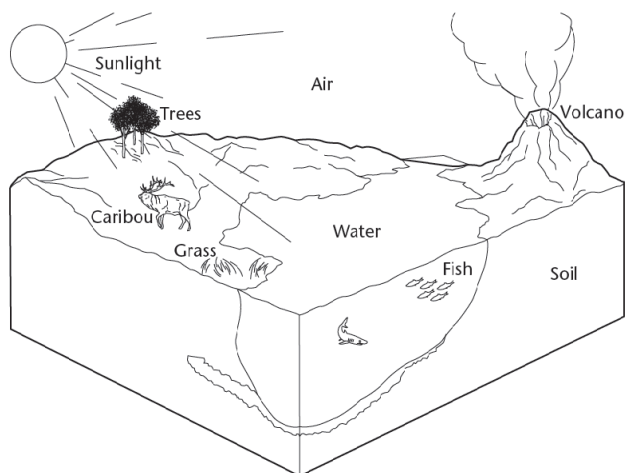
Biotic and Abiotic Factors:

Ecosystems include biotic and abiotic factors.

- A biotic factor is any living part of an environment. (Animals, plants, bacteria, fungi, etc.)
- An abiotic factor is any nonliving part of an environment. (Air, rocks, soil, water, etc.)

4. Circle each *abiotic* factor.

5. Place an X over each *biotic* factor.

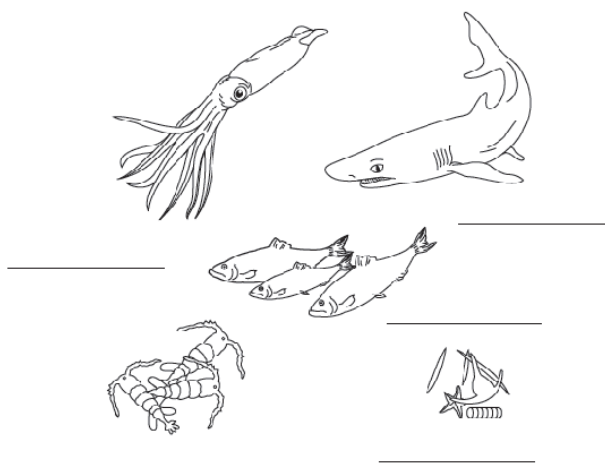


Food Chains and Food Webs:

- A food chain is a series of steps in which organisms transfer energy by eating and being eaten.
- A food web is a network of all the food chains in an ecosystem.

6. Draw one arrow between each organism to show how energy moves through this food chain.

7. Write *producer*, *herbivore*, or *carnivore* under each organism.

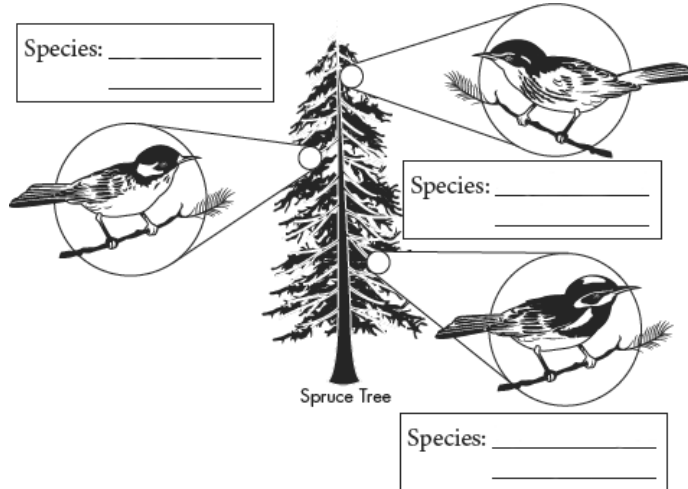


Competition: Competition occurs when organisms try to use the same limited resources.

- Direct competition between species often results in one species dying out. This is the basis of the competitive exclusion principle. This principle states that no two species can occupy exactly the same niche (or job) in exactly the same habitat at the same time.
- Competition helps to determine the number and type of species in a community.

8. Use the information in the box about each warbler species to label the diagram below. Then, answer the questions that follow.

- The Cape May warbler feeds at the tips of branches near the top of a spruce tree.
- The bay-breasted warbler feeds in the middle part of a spruce tree.
- The yellow-rumped warbler feeds in the lower part of a spruce tree and at the bases of the middle branches.



9. Do these three species of warbler share the same niche? Explain.

10. For what abiotic resources might these three species compete? For what biotic resources might they compete?

Carbon Cycle:

The carbon cycle describes how carbon moves between the atmosphere, the ocean, land, and living things.

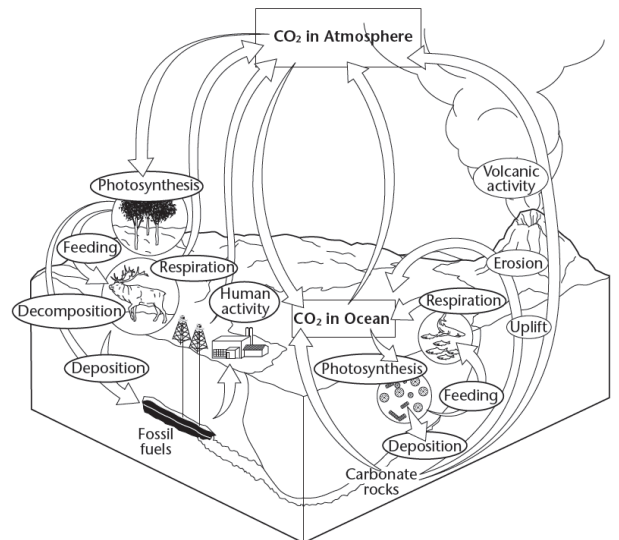
- 11. Color the arrows that show carbon moving into the atmosphere blue.
- 12. Color the arrows that show carbon moving out of the atmosphere yellow.

13. Which process releases carbon into the atmosphere?

- photosynthesis respiration

14. Which process takes carbon out of the atmosphere?

- photosynthesis respiration



Symbiosis: Symbiosis occurs when two species live closely together in one of three ways: mutualism, commensalism, or parasitism.

- In mutualism, both species benefit from the relationship.
- In parasitism, one species benefits by living in or on the other and the other is harmed.
- In commensalism, one species benefits and the other is neither helped nor harmed.

Match the example with the type of relationship. A relationship type may be used more than once.

- _____ 15. a tick living on the body of a deer
- _____ 16. a bee eating a flower's nectar and picking up the flower's pollen
- _____ 17. a barnacle (not harmful) living on a whale's skin
- _____ 18. a tapeworm living in a person's intestines
- _____ 19. an aphid providing food to an ant in exchange for protection
- _____ 20. an oxpecker eating parasites off a zebra's skin

- Type of Relationship**
- A. mutualism
 - B. commensalism
 - C. parasitism