

Ecosystems Review #1
(Food Webs, Energy Pyramids, Carbon Cycle, Nitrogen Cycle)

Part A – Multiple Choice Questions

1. The ultimate source of energy in ecosystems is the
 - (A) plants.
 - (B) sun.
 - (C) wind.
 - (D) cosmic forces.

2. The role an organism plays within its community is its
 - (A) habitat.
 - (B) energy source.
 - (C) trophic level.
 - (D) status level.

3. A herbivore would occupy which trophic level?
 - (A) first trophic level
 - (B) second trophic level
 - (C) third trophic level

4. All individuals of the same species within a given area comprise a(n)
 - (A) population.
 - (B) abiotic factor.
 - (C) community.
 - (D) ecosystem.

5. What percentage of energy is used and lost as heat at each trophic level?
- (A) 10%
 - (B) 30%
 - (C) 50%
 - (D) 90%
6. Plants convert carbon dioxide and water into carbohydrates and oxygen. This process is called
- (A) fermentation.
 - (B) photosynthesis.
 - (C) respiration.
 - (D) combustion.
7. Where do plants get the energy necessary to perform photosynthesis?
- (A) water
 - (B) nitrogen
 - (C) carbohydrates
 - (D) sunlight
8. In the carbon cycle, animals return carbon to the atmosphere by
- (A) fermentation.
 - (B) photosynthesis.
 - (C) respiration.
 - (D) combustion.
9. Nitrogen fixation is a process that converts
- (A) nitrogen from the water into a gas.
 - (B) ammonium into nitrates.
 - (C) atmospheric nitrogen into ammonium.
 - (D) nitrates into atmospheric nitrogen gas.

10. Which of the following are responsible for the process of nitrogen fixation?

- (A) bacteria
- (B) parasites
- (C) birds
- (D) mushrooms

11. The process of converting ammonium to nitrates is known as

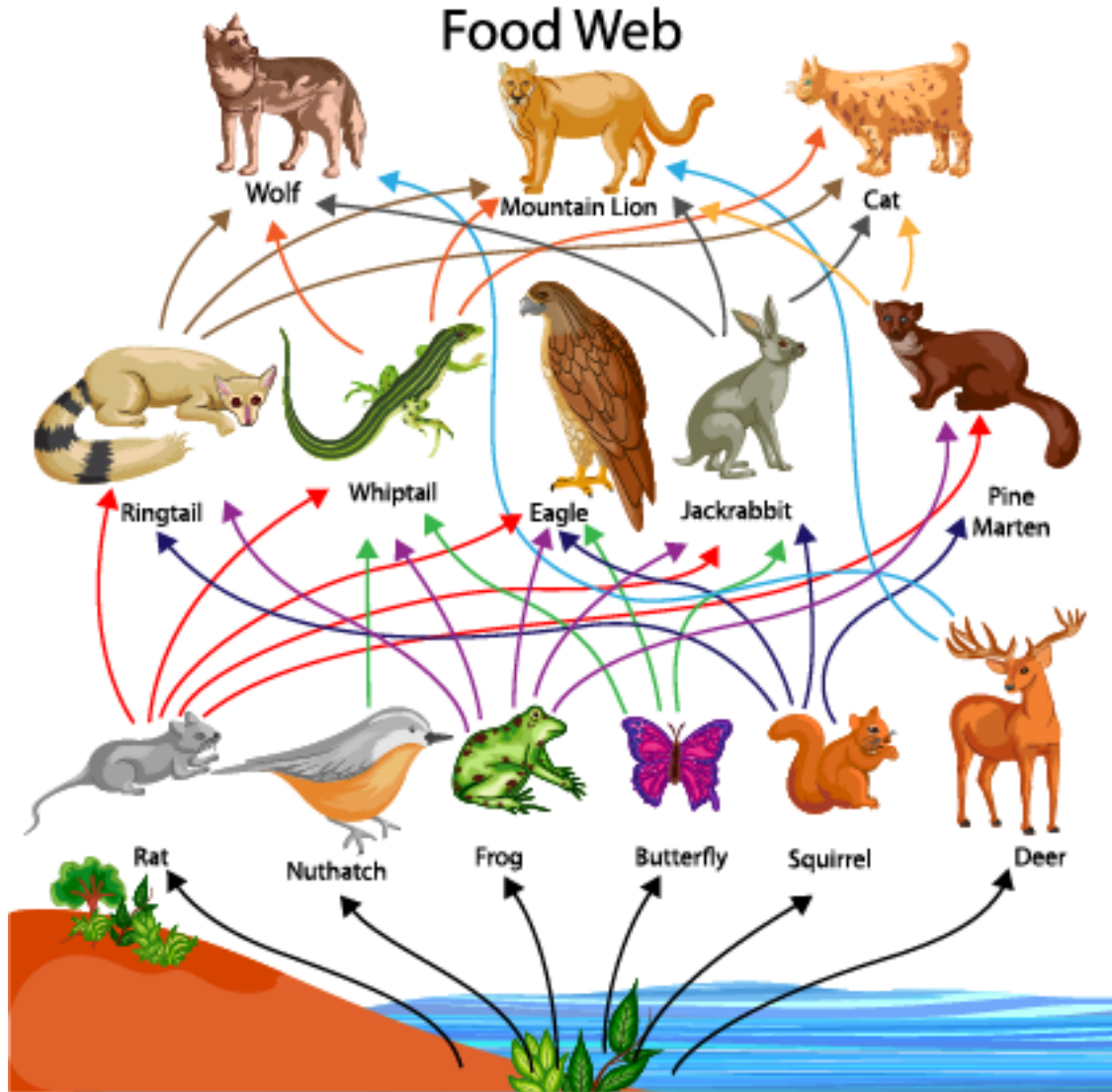
- (A) nitrogen fixation.
- (B) nitrification.
- (C) denitrification.
- (D) nitrogen gassing.

12. Denitrifying bacteria convert

- (A) nitrates into nitrogen gas.
- (B) ammonium into nitrates.
- (C) nitrogen gas into nitrates.
- (D) nitrates into oxygen.

Part B – Free Response Questions

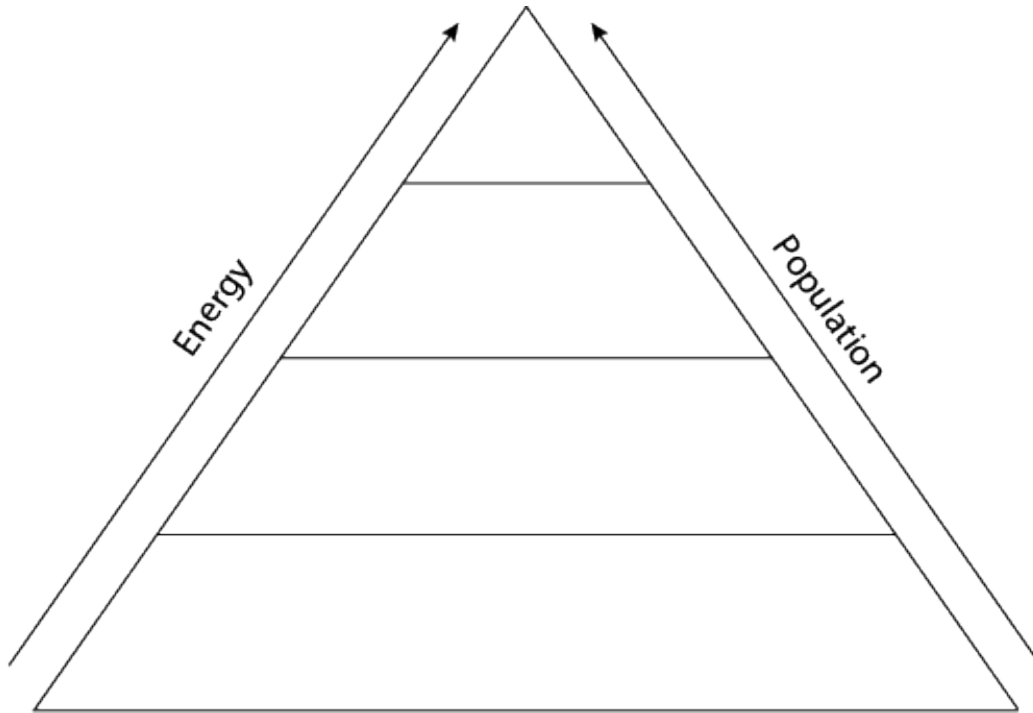
1. An ecosystem contains only the animals shown in the following foodweb.



Credit: vecton (Adobe Stock)

- (a) Label the primary, secondary, and tertiary consumers.
- (b) The producers are not labelled on the diagram. Provide an example of a possible producer for this ecosystem.

(c) Complete the following energy pyramid using the organisms from the food web.



(d) If the producers store 1 000 000 J of energy, how much energy would be stored by the tertiary consumers?

(e) Briefly explain what could happen to the eagles and the rats if all the trees in the ecosystem were cut down.

2. Explain how the excess nitrogen from someone over fertilizing their lawn could travel to the ocean.