

support organism. The remora fish is commensalistic to the shark, because it depends on the shark's sloppy eating habits to get bits of food. The shark, in the meantime, wouldn't even get the left over scraps of food. Many decomposers are commensals because they rely on the droppings, dead and discarded tissues of another organism. These interactions are summarized in **Table D-1**.

Check For Understanding:

1. a. Calculate the new population size after one year if the starting number of individuals is 500 and the annual rates are: I = -3%, E = 10%, N = 4%, and M = 7%.
b. Offer an explanation as to what might be causing this change to this population.
2. Contrast exponential and logistic growth in terms of their rate and the effect the environment has on them.
3. Record an example of your own for each of the five types of interactions between organisms.

QUESTIONS TO CONSIDER

Multiple Choice

1. Which sequence is the **MOST LIKELY** to occur during succession in a cedar forest?
 - A. Lichen – shrubs and grasses – trees.
 - B. Moss – grasses – deciduous growth.
 - C. Cedar trees – seedlings – cedar trees.
 - D. Grasses – deciduous trees – cedar trees.
2. A pioneer species is
 - A. an ancient type of organism.
 - B. one that has evolved quickly.
 - C. one that has avoided evolution.
 - D. one of the first types to grow in a new area.
3. Which of the following is an abiotic feature of an environment?
 - A. Fish.
 - B. Birds.
 - C. Trees.
 - D. Rivers.
4. In an energy pyramid, the producers are at the
 - A. top with less energy at each successive level.
 - B. top with more energy at each successive level.
 - C. bottom with more energy at each successive level.
 - D. bottom with less energy at each successive level.
5. Which of the following is **LEAST** likely to be true about herbivores and carnivores in the same ecosystem?
 - A. Both are part of the biota of the area.
 - B. They are both are the same trophic level.
 - C. The carnivores could prey on the herbivores.
 - D. The density of both populations undergoes regular fluctuations.
6. Every population requires
 - A. a lack of predation.
 - B. continuous resources.
 - C. continuous succession.
 - D. inverted energy pyramids.
7. Which of the following would increase the size of a population?
 - A. Increased natality.
 - B. Increased mortality.
 - C. Increased emigration.
 - D. Decreased immigration.
8. A population of 1000 members is changing at the following rates: N = 10%, M = 14%, I = 18%, E = 22%. After one year, the population would size be
 - A. 920.
 - B. 992.
 - C. 1008.
 - D. 1080.
9. Bacteria grown on a rotting apple is an example of
 - A. open population.
 - B. carrying capacity.
 - C. closed population.
 - D. cyclical changes in population size.
10. When the density of a growing population surpasses the carrying capacity of its environment, the organisms will
 - A. starve to death and go extinct.
 - B. struggle and begin to die faster than new members are produced.
 - C. reduce the number of offspring per female in the population.
 - D. stop reproducing until the population size decreases significantly.
11. Cyclical changes in population density exist in an environment that is
 - A. changing rapidly.
 - B. undergoing succession.
 - C. undergoing severe selective pressures.
 - D. relatively stable over a long period of time.