

## Module Test: Dynamic Ecosystems

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1) The largest number of individuals of one species that an ecosystem can support over time is its biotic potential.

- ☐ True
- ☐ False

2) A symbiotic relationship that benefits both species is referred to as commensalism.

- ☐ True
- ☐ False

3) What is the difference between a community and an ecosystem?

- ☐ A) An ecosystem consists of living and nonliving things in an area. A community is all the members of one species in the area.
- ☐ B) An ecosystem consists of living and nonliving things in an area. A community is all the populations in the area.
- ☐ C) An ecosystem consists of nonliving things in an area. A community is all the living things in the area.
- ☐ D) An ecosystem consists of all the populations in an area. A community is all the nonliving things in the area.

4) Which of these is a limiting factor?

- ☐ A) food supply
- ☐ B) shelter
- ☐ C) existence of predators
- ☐ D) all of the above

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5) In a predator-prey relationship, \_\_\_\_\_.

- ☐ A) the predator hunts the prey for food
- ☐ B) the prey hunts the predator for food
- ☐ C) the prey keeps the predator population from growing too large
- ☐ D) the prey are producers

6) A population cannot exceed the \_\_\_\_\_ of its environment, which is the largest number of individuals that an ecosystem can support.

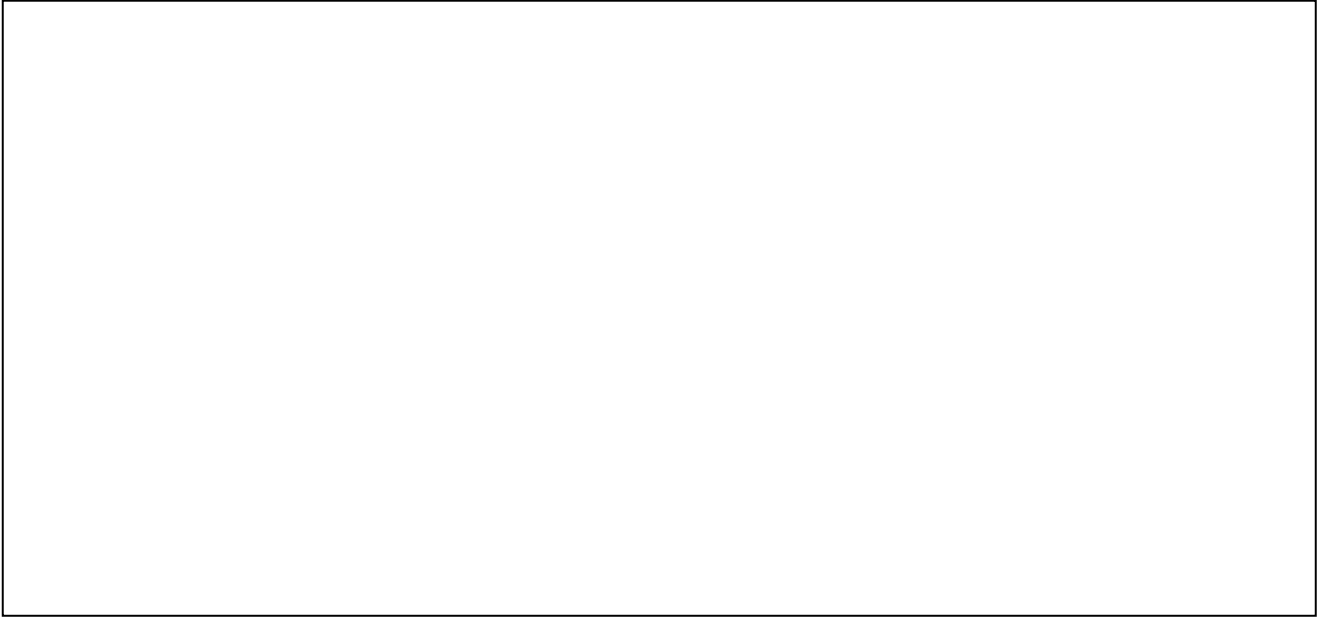
7) A symbiotic relationship in which both partners benefit is called \_\_\_\_\_.

8) List **three** things that are limiting factors on the growth of a population.

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**9)** Compare and contrast a population and a community.



**10)** Explain how competition can limit population size.



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**11)** Match the relationship to the example.

heartworm in a dog	_____	<b>A)</b> parasitism
sea anemones help crabs fight off predators, and eat leftovers from the crabs' meals	_____	<b>B)</b> mutualism

**12)** Succession continues until it reaches a pine forest community.

- ☐ True
- ☐ False

**13)** A climax community is a community that \_\_\_\_\_.

- ☐ **A)** is about to experience a major change
- ☐ **B)** has just been radically altered by a natural disaster
- ☐ **C)** is a stable community that no longer goes through major ecological change
- ☐ **D)** is always characterized by large trees

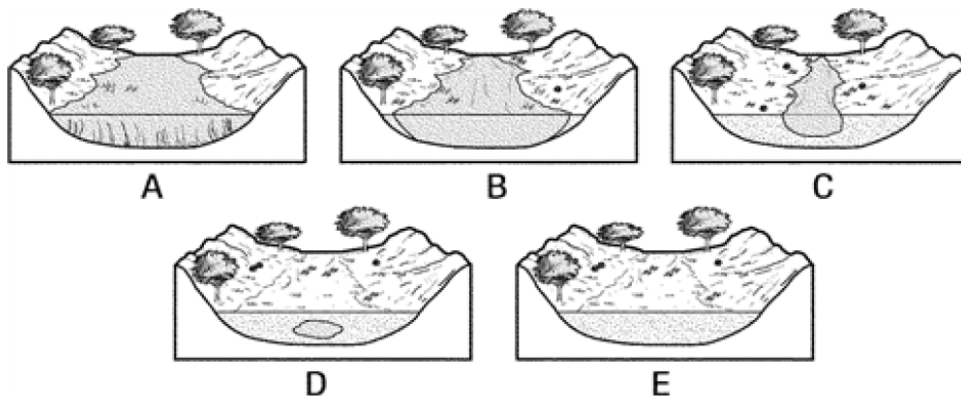
**14)** As plants in an area undergoing ecological succession die, \_\_\_\_\_.

- ☐ **A)** they are replaced by plants of the same species
- ☐ **B)** they are replaced by plants of a different species
- ☐ **C)** either a or b could occur
- ☐ **D)** no plants grow in their place

**15)** Runoff fertilizer and livestock waste from farms can add to the \_\_\_\_\_ of a pond.

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**16)** Write a sentence that summarizes the changes shown here.

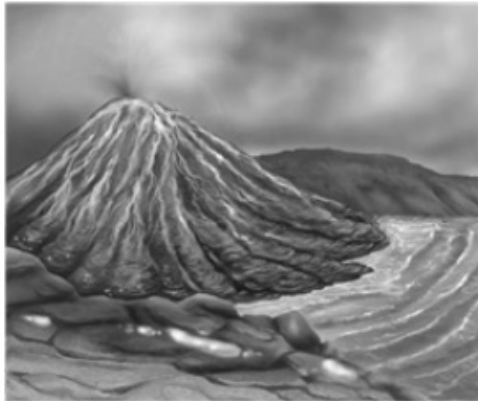


Blank area for writing a sentence summarizing the changes shown in the diagrams.

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**17)** Name and explain the process shown in the following pictures.



I



II



III



IV

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**18)** Which change in the ecosystem increases the carrying capacity for a particular species?

- ☐ **A)** drought
- ☐ **B)** flood
- ☐ **C)** appearance of a competing species
- ☐ **D)** disappearance of a competing species

**19)** If a buzzard and a coyote both need the meat from a dead animal, there is \_\_\_\_\_ for that food resource.

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**20)** Scientists are concerned about the loss of consumers at the top of the food web in many different ecosystems around the world. Some examples are listed:

- The loss of lions and leopards in Ghana resulted in an increase in the olive baboon population.
- Baboons are now pests in neighboring villages, where they did not go previously, and have spread intestinal parasites to human populations.
- The loss of wolves in Yellowstone National Park resulted in elk populations greatly increasing. Over time, many of the young aspen trees in the park were wiped out.
- The loss of great sharks along the East Coast of the United States resulted in an increase in populations of smaller fish, such as rays, skates, and smaller sharks, and a collapse, over time, of coastal scallop populations.
- The loss of jaguars and eagles in Venezuela resulted in howler monkey and iguana populations greatly increasing.
- The jaguars and eagles fled and the howler monkeys and iguanas ended up on separate man-made islands after the region was flooded when a dam was built.
- Years after the flooding, the only plants still living on these islands have either thorns or contain chemicals that make them less desirable to eat.

a. Identify the relationship that **all** consumers at the top of the food web had with other organisms in their ecosystems before the consumers at the top of the food web were lost.



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b. Describe a pattern of interactions seen, after the loss of the consumers at the top of the food web, in **all** of the different ecosystem examples. Support your description with evidence from any two examples.

c. Predict what happens to the other organisms within **any** ecosystem when a consumer at the top of the food web is lost.

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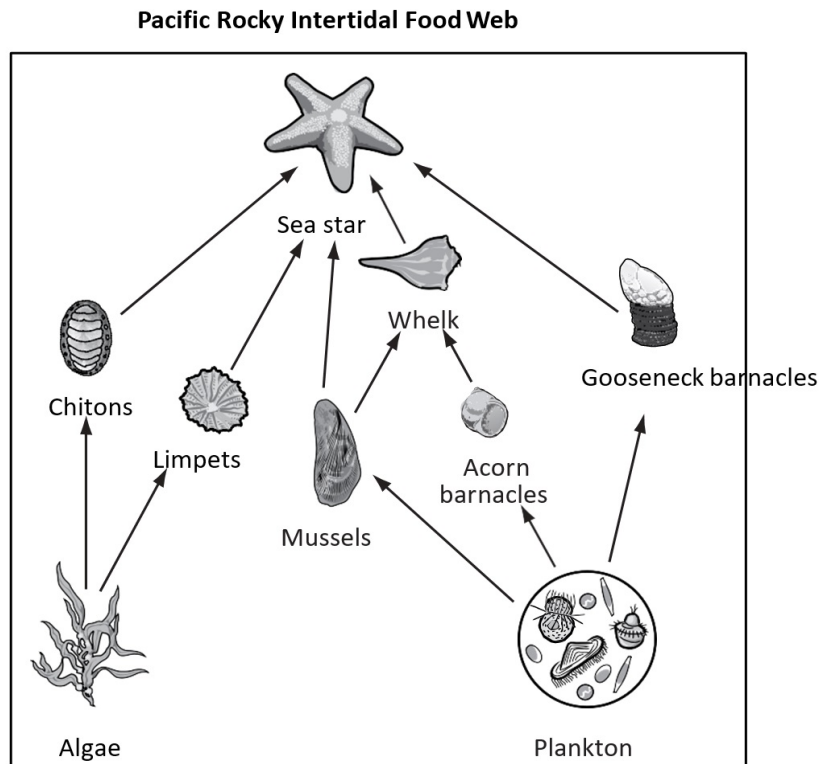
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- 21)** The food web shows relationships among organisms that live on steep rocks between high and low tides along the Pacific coast. Except for the plankton and sea star, all of the organisms in this community must attach themselves to the rocks to survive.



Based on evidence from other ecosystems, scientists predict that competition increases when a top predator within an ecosystem is removed.

Identify and describe evidence within the Pacific rocky intertidal ecosystem that would support the scientists' prediction.

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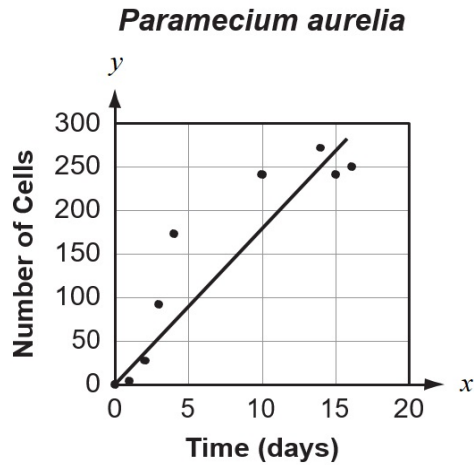
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- 22)** A single-celled, microscopic organism, *Paramecium caudatum* (*P. caudatum*), was grown in a container with food and freshwater. The growth rate of the *P. aurelia* population is shown in the graph.



- a. Use the information and graph to describe the relationship among time, food, and the *P. Aurelia* population.

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b. Predict how the *P. aurelia* population would most likely change if another microscopic organism, *Paramecium caudatum* (*P. caudatum*), is added on day 17 to the same container with no additional food or freshwater. Assume that *P. caudatum* is not a predator of *P. aurelia* and that both species use the same food. Provide reasoning for your prediction.

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**23)** A species of sea snail and a species of clam have the same predators: lobsters and octopuses. These predators are highly mobile and will travel great distances to search for their prey. These snails and clams generally live in separate areas but can be found living together. A group of scientists conducted an experiment in which they added clams to areas that previously contained only snails. The scientists made the following observations over time:

- The clam population increased.
- The number of octopuses in the area increased.
- The number of lobsters decreased slightly.
- The lobsters fed on clams and snails.
- The octopuses fed on lobsters, as well as clams and snails.
- The snail population decreased.

a. Explain a likely reason for the increased number of octopuses in the area. Provide evidence to support your answer.



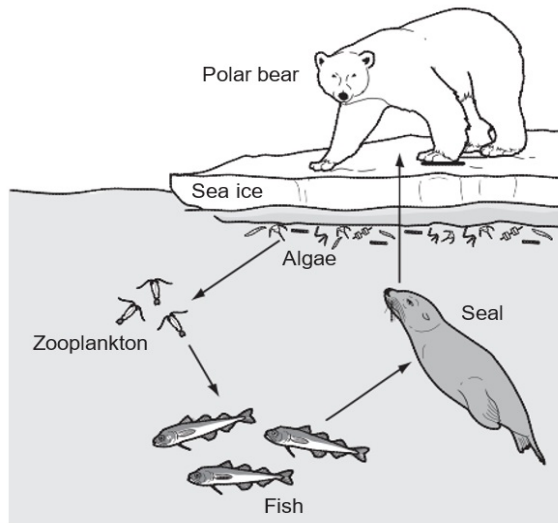
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b. Predict what would **most likely** happen to the octopus population if the number of snails decreased to near extinction in the area. Provide evidence to support your answer.

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- 24)** Summer Arctic sea ice has steadily shrunk over the last 30 years. Organisms in the Arctic ecosystem depend on sea ice for shelter, access, and nutrients. For example, algae grow on the solid surface of the sea ice. The algae is eaten by zooplankton, which are eaten by fish. Seals feed on the fish and raise their young on the sea ice above. Polar bears travel across the sea ice to hunt the seals. The diagram shows this food chain.



Some biologists claim that the loss of Arctic sea ice will reduce the size of many Arctic animal populations over the next half century. They point to polar bears as a leading example of a large predator that depends on sea ice for survival.

However, other scientists do not agree. Their counterclaim is based on data from polar bear studies, such as those shown in the table.

**Polar Bear  
Population Estimates**

Year	Population
1950–1960	5,000
1965–1970	8,000–10,000
1984	25,000
2005	20,000–25,000

Construct an argument supporting one of the claims, with evidence from the information and data about the food chain and polar bear populations.

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Date: \_\_\_\_\_

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