

**BIOLOGY**

**WORKSHEET**

**GRADE: 11**

**Q.1: Choose the letter of the best answer.**

- \_\_\_\_\_ 1. Two robins eating worms on the same lawn is an example of
- mutualism.
  - commensalism.
  - competition.
  - parasitism.
- \_\_\_\_\_ 2. Predation is best described as
- one organism capturing and eating another.
  - two organisms competing for limited resources.
  - an interaction in which two species benefit from each other.
  - an interaction in which one species benefits and other is not affected.
- \_\_\_\_\_ 3. Aphids eat the sap from plants and excrete sticky waste that ants eat. The ants protect the aphids from predators. This type of interaction is called
- parasitism.
  - mutualism.
  - commensalism.
  - competition.
- \_\_\_\_\_ 4. An oak tree provides a sparrow a place to build a nest. The nest neither benefits nor harms the tree. What is the name for this type of relationship?
- mutualism
  - commensalism
  - predation
  - parasitism
- \_\_\_\_\_ 5. One difference between parasitism and predation is that parasites
- do very little harm to their hosts.
  - keep their hosts alive for a period of time.
  - attack the host only from the inside.
  - are not very big.

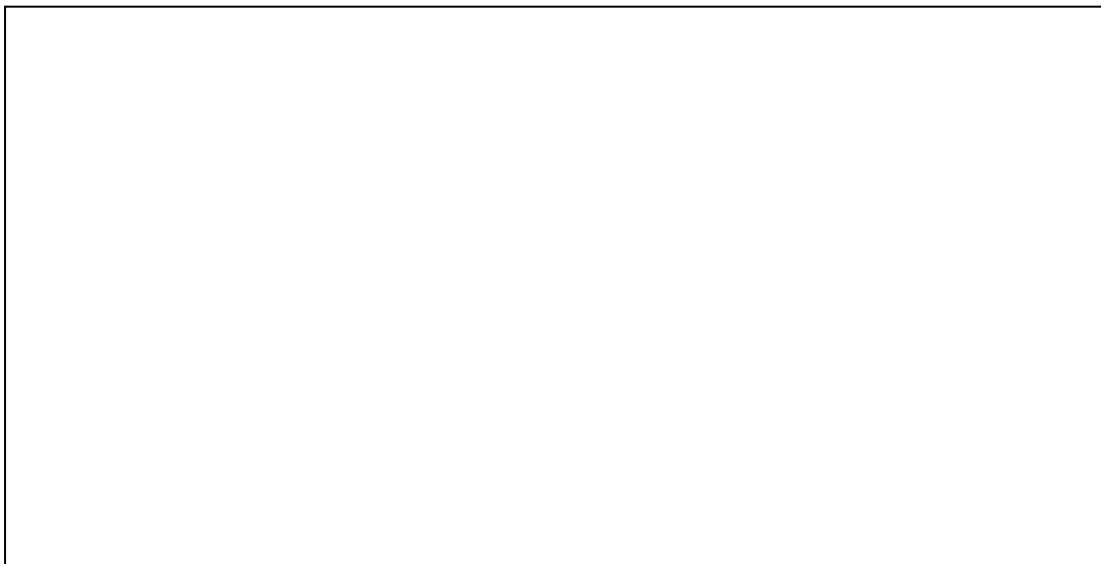
## VOCABULARY

competition	symbiosis	commensalisms
predation	mutualism	parasitism

**MAIN IDEA:** Competition and predation are two important ways in which organisms interact.

**Next to each situation described below, write whether it is an example of interspecific competition or intraspecific competition.**

- \_\_\_\_\_ 1. Two squirrels race up a tree to reach a hidden pile of nuts.
- \_\_\_\_\_ 2. A hyena chases off a vulture to feast on an antelope carcass.
- \_\_\_\_\_ 3. Different species of shrubs and grasses on the forest floor compete for sunlight.
- \_\_\_\_\_ 4. Brown bears hunting for fish on a river's edge fight over space.
- \_\_\_\_\_ 5. Male big horn sheep butt heads violently in competition for mates.
6. Draw and label a sketch that represents an example of a predator-prey interaction.



**MAIN IDEA:** Symbiosis is a close relationship between species.

7. For each type of symbiotic relationship, complete the chart with details about how each organism is impacted using the terms “Benefits,” “Harmed,” or “No impact.” For each situation, assume that Organism A initiates the relationship.

Symbiotic Relationship	Organism A	Organism B
mutualism		
commensalisms		
parasitism		

8. How is parasitism similar to and different from predation?

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9. What is the difference between endoparasites and ectoparasites?

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10. The term *symbiosis* comes from a Greek term which means “living together.” How does this word origin help to explain the definition of symbiosis?

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11. Use your knowledge of the word *mutual* to write a definition for mutualism.

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12. The word *commensalism* comes from the Latin *mensa*, meaning “table,” and *com-*, meaning “with.” If I come to your table to eat your food, I benefit but you don’t. Draw a sketch to show this meaning to help you remember it.

**Q.1: Choose the letter of the best answer.**

- \_\_\_\_\_ 1. A sequence of biotic changes that regenerate or create an ecological community is known as
- migration.
  - factors.
  - succession.
  - erosion.
- \_\_\_\_\_ 2. The development of an ecosystem in an area that has been covered by lava begins with the
- breakdown of rock by pioneer species.
  - migration of animals.
  - growth of trees and shrubs.
  - appearance of soil.
- \_\_\_\_\_ 3. Lichens and mosses that first live in uninhabited areas are examples of
- non-native species.
  - pioneer species.
  - primary species.
  - secondary species.
- \_\_\_\_\_ 4. Secondary succession is most likely to occur
- after a forest fire.
  - with pioneer species.
  - if a glacier shrinks.
  - on a new volcanic island.
- \_\_\_\_\_ 5. Which of the following statements about primary succession is true?
- It begins with a climax community.
  - Small mammals are first to inhabit the area.
  - It only occurs after glaciers retreat.
  - It begins with bare rock.

**KEY CONCEPT**

Ecological succession is a process of change in the species that make up a community.

**VOCABULARY**

succession	pioneer species
primary succession	secondary succession

**MAIN IDEA:** Succession occurs following a disturbance in an ecosystem.

1. What is ecological succession?

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2. Fill in the chart below with a description and simple sketch of the four main steps of primary succession. Include the amount of time it takes for each stage of this process.

_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3. Fill in the chart below with a description and simple sketch of the four main steps of secondary succession. Include the amount of time it takes for each


stage of this process.

### Vocabulary Check

4. What is the difference between primary and secondary succession?

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5. Use your knowledge of the word *pioneer* to write a definition for the term *pioneer species*.

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**BIOLOGY****Q.1: Choose the letter of the best answer.**

- \_\_\_\_\_ 1. All of the environmental features in the area where an organism lives are known as its
- niche.
  - habitat.
  - community.
  - behavior.
- \_\_\_\_\_ 2. The lion's ecological niche includes its behavior and
- the shade trees on the savanna.
  - its position in the food web.
  - an ecological equivalent.
  - all the nearby watering holes.
- \_\_\_\_\_ 3. The idea that two species cannot occupy the same niche is known as
- ecological equivalence.
  - niche partitioning.
  - evolutionary response.
  - competitive exclusion.
- \_\_\_\_\_ 4. When two species compete for the same resources, their ecological niche may
- become extinct.
  - adapt to one species.
  - not favor one of them.
  - split into two niches.
- \_\_\_\_\_ 5. Ecological equivalents are species that occupy similar niches
- in different geographical regions.
  - with plenty of food.
  - in different types of habitats.
  - after niche partitioning.

**HA:**

**Q.2: Fill the chart.**

Habitat:

Ecological niche:

Competitive exclusion is a principle that states:

Two other results of competitive exclusion:

- 
- 

An ecological equivalent is:





Name:

Class:

Date:

Chapter Test

Biology

Grade: 11

**Q.1: Choose the letter of the best answer.**

- \_\_\_\_\_ 1. The European red squirrel population is declining due to competition with the North American gray squirrel. Most likely, what will eventually happen to the red squirrel?
- It will win its competition with the gray squirrel.
  - It will be an ecological equivalent of the gray squirrel.
  - It will become extinct.
  - It will move to a different community

- \_\_\_\_\_ 2. What word or phrase would be most appropriate opposite “commensalism” under “organism 2”?

Symbiosis 1	Organism 1	Organism 2	Example
Mutualism	Benefits	Benefits	Bee/Flowering Plant
Commensalism	Benefits		Human/Eyelash Mite
Parasitism	Benefits	Is Harmed	Dog/Flea

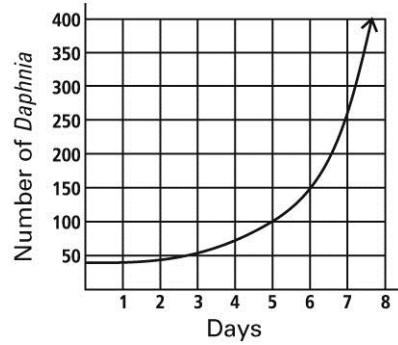
- Neither Harms or Benefits
  - Is Harmed
  - Benefits
  - Benefits over Time
- \_\_\_\_\_ 6. Which statement is most likely true about the Daphnia population shown in the graph?

- \_\_\_\_\_ 3. The white-tailed deer and the kangaroo are both large herbivorous mammals that occupy similar niches but live on different continents. They are an example of
- ecological equivalents.
  - competitors.
  - niche partitioning.
  - competitive exclusion.

- \_\_\_\_\_ 4. A herd of caribou has more births than deaths and more immigration than emigration. What will most likely happen to the size of the herd?
- It will increase.
  - It will decrease.
  - It will increase, and then decrease.
  - It will stay the same.

- \_\_\_\_\_ 5. In 1988 several large forest fires occurred in Yellowstone National Park. What process occurred after these fires?
- primary succession
  - secondary succession
  - pioneer succession
  - symbiotic succession

**DAPHNIA POPULATION GROWTH**



- a. It has reached its carrying capacity.  
 b. It has a large food supply.  
 c. It has a small food supply.  
 d. It will level off during day 8.
- \_\_\_\_\_ 7. Lions eat zebras. Zebras are part of the lion's  
 a. biotic factors.  
 b. ecological niche.  
 c. local habitat.  
 d. abiotic conditions.
- \_\_\_\_\_ 8. Parasitism is most similar to  
 a. interspecific competition.  
 b. mutualism.  
 c. commensalism.  
 d. predation.
- \_\_\_\_\_ 12. The new island of Surtsey was formed near Iceland by a series of volcanic eruptions. Which of these processes occurred first on Surtsey?  
 a. A complex ecosystem developed.  
 b. Volcanic rock broke down into soil.  
 c. Plants grew on the island.  
 d. Animals moved onto the island.
- \_\_\_\_\_ 9. Fourteen beavers live in a pond with an area of 2 square kilometers. What is the population density of the beavers?  
 a. 7 beavers per square kilometer  
 b. 14 beavers per square kilometer  
 c. 16 beavers per square kilometer  
 d. 28 beavers per square kilometer
- \_\_\_\_\_ 10. An alder tree is not a pioneer species because  
 a. alder trees are a form of lichen.  
 b. it is not one of the trees that make up the final forest.  
 c. smaller organisms come before trees in succession.  
 d. pioneer species are always animals.
- \_\_\_\_\_ 11. Which of these is a density-independent limiting factor?  
 a. any increase in population  
 b. the introduction of a parasite  
 c. a decrease in predators  
 d. an earthquake
- \_\_\_\_\_ 13. Many endoparasites lack complex digestive systems. Which is the most likely reason for this?  
 a. Endoparasites eat only plants, which are easy to digest.  
 b. Endoparasites do not usually kill their hosts.  
 c. Endoparasites feed on food already digested by the host.

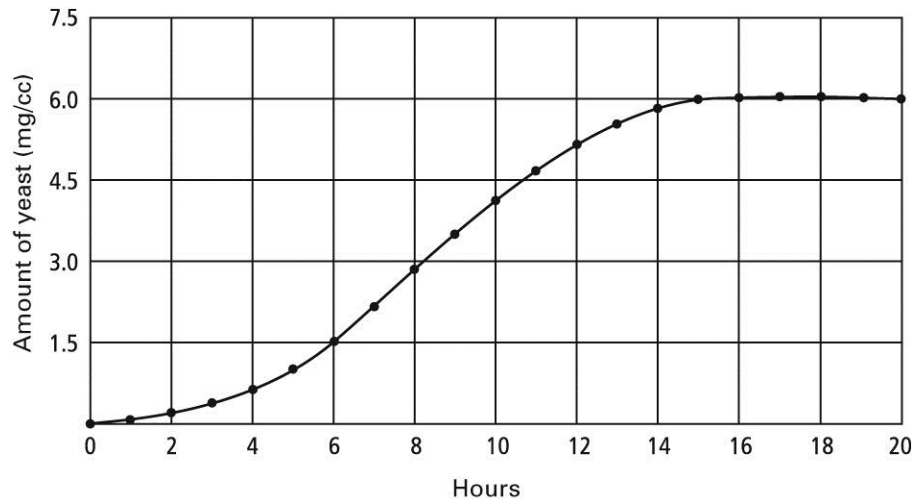
d. Endoparasites live only inside their hosts, not outside.

\_\_\_\_\_14. What might happen if an organism with type III survivorship were introduced into a new environment with no predators?  
a. It would become extinct.  
b. Its survivorship would change to type I.  
c. Its population would increase rapidly.  
d. Its birth rate would decrease.

\_\_\_\_\_15. Bobcats are generally solitary and establish territories of a certain size where they hunt for food. What type of population dispersion would you expect bobcats to have?  
a. clumped dispersion  
b. uniform dispersion  
c. random dispersion  
d. competitive dispersion

**Q.2: Short Answer Use the diagram below to answer items 16–20.**

**YEAST POPULATION GROWTH IN A SUGAR SOLUTION OVER A 20-HOUR PERIOD**



16. After how many hours does the yeast population shown in Figure reach carrying capacity?

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17. What amount of yeast constitutes the carrying capacity shown in Figure ?

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18. What is the amount of yeast in Figure at the 6-hour mark?

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19. Describe what is happening to the yeasts at time 8 hours.

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20. What type of population growth does Figure show? How do you know?

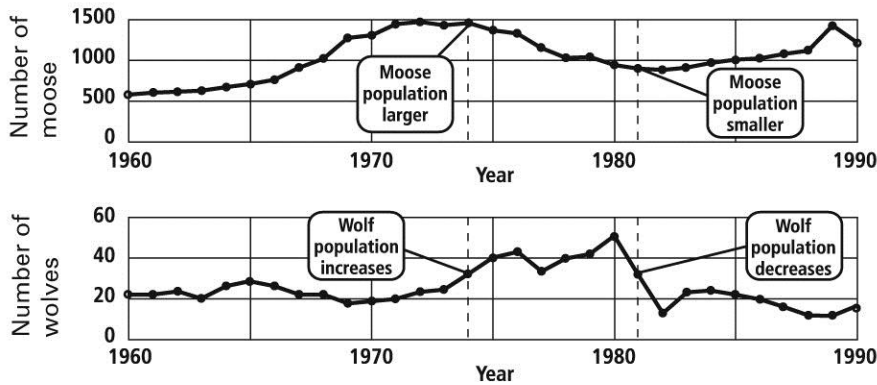
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**Q.3: Use the diagram below to answer items 21–25.**

**MOOSE AND WOLF POPULATIONS, ISLE ROYALE NATIONAL PARK**



21. What is the moose population in 1981?

\_\_\_\_\_

22. Is the moose population in 1981 relatively high or low?

\_\_\_\_\_

23. Is the wolf population in 1981 increasing or decreasing?

\_\_\_\_\_

24. Why is the wolf population in 1981 changing the way it is?

\_\_\_\_\_

\_\_\_\_\_

25. Compare the moose and wolf populations in 1974 and in 1981. How are the populations different? Explain your answer.

\_\_\_\_\_

\_\_\_\_\_



## BIOLOGY

### WORKSHEET

GRADE: 11

#### Q.1: Choose the letter of the best answer.

- \_\_\_\_\_ 1. Which of the following describes the density of a population?
- 5 sloths dispersed randomly
  - 100 people in the area
  - 100 wolves per square mile
  - 1 acre per family
- \_\_\_\_\_ 2. The way in which individuals of a population are spread out is called
- population density.
  - population dispersion.
  - survivorship.
  - predation.
- \_\_\_\_\_ 3. Zebra herds that live and move together are an example of what type of dispersion?
- clumped dispersion
  - uniform dispersion
  - random dispersion
  - territorial dispersion
- \_\_\_\_\_ 4. What does a survivorship curve show?
- the number of births and deaths each year
  - the number of predators that fed on a species' eggs
  - the number of offspring born in a particular year
  - the number of offspring still alive over time
- \_\_\_\_\_ 5. Most large mammals have type 1 survivorship curves, which means they have
- low infant mortality and high rates of survival into old age.
  - roughly equal survivorship rates at all ages.
  - high numbers of offspring so that a few will survive.
  - very high levels of predation and uniform dispersion.

**KEY CONCEPT**

Each population has a density, a dispersion, and a reproductive strategy.

**VOCABULARY**

population density	population dispersion	survivorship curve
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**MAIN IDEA:** Population density is the number of individuals that live in a defined area.

1. What is the formula for calculating population density?

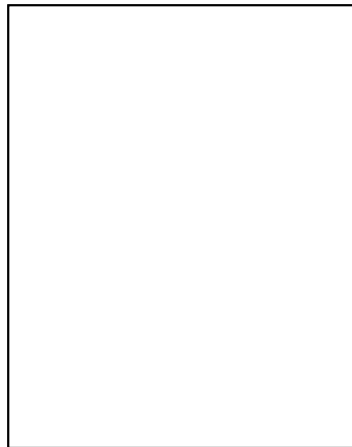
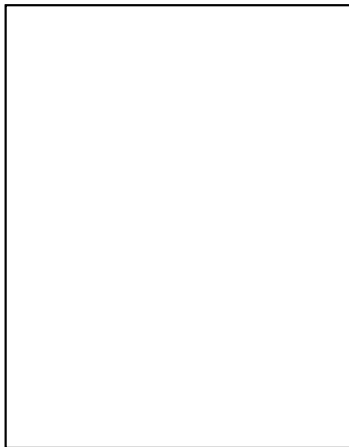
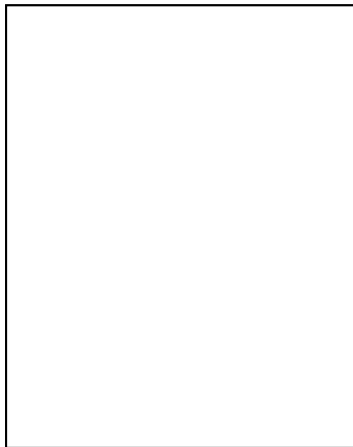
\_\_\_\_\_

2. What might cause the population density of a population of deer to increase?

\_\_\_\_\_

**MAIN IDEA:** Geographic dispersion of a population shows how individuals in a population are spaced.

3. In the boxes below, draw and label the three types of population dispersion patterns.



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4. List two reasons why a population might live in a clumped dispersion and two reasons why a population might live in a uniform dispersion.

\_\_\_\_\_

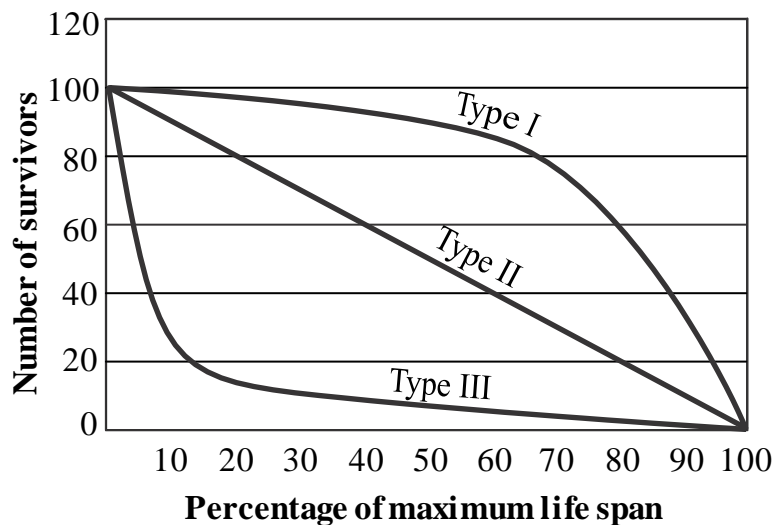
\_\_\_\_\_

**MAIN IDEA:** Survivorship curves help to describe the reproductive strategy of a species.

5. What is meant by the term *reproductive strategy*? What accounts for differences in reproductive strategies?

\_\_\_\_\_

\_\_\_\_\_



Take a look at each of the survivorship curves shown above. Next to each type of organism listed below, write in the space provided whether it is an example of Type I, Type II, or Type III survivorship.

- |                       |                        |
|-----------------------|------------------------|
| _____ 6. lion         | _____ 10. invertebrate |
| _____ 7. bird         | _____ 11. fish         |
| _____ 8. reptile      | _____ 12. giraffe      |
| _____ 9. small mammal | _____ 13. human        |

### Vocabulary Check

14. What is the difference between population density and population dispersion?

\_\_\_\_\_

\_\_\_\_\_



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**BIOLOGY**

**WORKSHEET**

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**Q.1: Choose the letter of the best answer.**

- \_\_\_\_\_ 1. The movement of a single caribou into a herd is an example of  
a. immigration.  
b. emigration.  
c. population.  
d. competition.
- \_\_\_\_\_ 2. What pattern of growth will a population with limited resources show?  
a. exponential  
b. logistic  
c. density-dependent  
d. density-independent
- \_\_\_\_\_ 3. The carrying capacity is most likely to change  
a. if emigration takes place.  
b. when resources remain the same.  
c. for all species at the same time.  
d. after a fire or flood.
- \_\_\_\_\_ 4. Diseases may spread more rapidly when an area is crowded, so disease is considered to be a  
a. type I survivorship curve.  
b. population crasher.  
c. density-dependent limiting factor.  
d. requirement for logistic growth.
- \_\_\_\_\_ 5. Which of the following is an example of a density-independent limiting factor?  
a. a parasite  
b. a decrease in prey  
c. a food shortage  
d. a natural disaster

**KEY CONCEPT**

Populations grow in predictable patterns.

**VOCABULARY**

immigration	logistic growth	density-dependent limiting factor
emigration	carrying capacity	density-independent limiting factor
exponential growth	population crash	

**MAIN IDEA:** Changes in a population's size are determined by immigration, births, emigration, and deaths.

**Choose a word from the box below that best completes each sentence.**

births	emigration	deaths	immigration
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1. When resources are abundant in a particular area, individuals may move into the population of this area. This movement of individuals into a population from a different population is called \_\_\_\_\_.
2. A very cold winter has left many deer in a population hungry and sick. By the end of the winter, this population will likely decrease because of \_\_\_\_\_.
3. A deer population experiences growth when the rate of reproduction increases. This change in population size is due to \_\_\_\_\_.
4. As humans move into their territory, many members of a deer population move away and join other herds. This movement of individuals out of a population into a new population is called \_\_\_\_\_.
5. How does the availability of resources affect population growth?

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**MAIN IDEA:** Population growth is based on available resources.

6. In the space below, draw and label the two different types of population growth curves.

**Write a brief description next to each graph.**

<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
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7. What type of population growth curve shows a carrying capacity?

\_\_\_\_\_

8. What type of population growth is at risk for a population crash? Explain why.

\_\_\_\_\_

**MAIN IDEA:** Ecological factors limit population growth.

9. List three examples of density-dependent limiting factors.

\_\_\_\_\_

10. List three examples of density-independent limiting factors.

\_\_\_\_\_

## Vocabulary Check

**Explain why each pair of words below are opposites.**

11. emigrate/immigrate

\_\_\_\_\_

12. density-dependent limiting factor/density-independent limiting factor

\_\_\_\_\_

13. exponential growth/logistic growth

\_\_\_\_\_