

Population Growth

Section Review

36.1

The Big Idea

The size of a population is affected by living and nonliving factors. 36.1–36.2

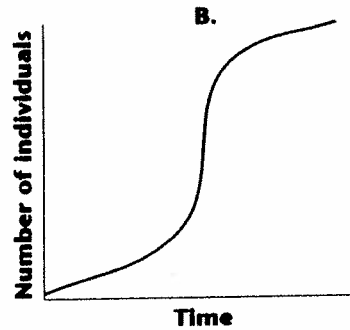
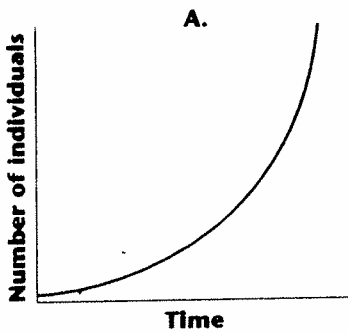
Concepts

- If all individuals in a population survived and reproduced, the population would double in each generation. Even smaller percentage increases can lead to exponential growth.
- Four factors that affect growth rate are birth rate, death rate, immigration, and emigration.
- A population's carrying capacity is determined by limiting factors.

Words

population exponential growth limiting factor carrying capacity

PART A



1. Which curve illustrates the kind of growth that would take place under ideal conditions with unlimited resources? What is such growth called?

2. What curve illustrates growth that is eventually limited to a number that can be supported by environmental resources? What is that number called?

PART B Define the following terms.

1. population _____

2. exponential growth _____

3. immigration _____

4. emigration _____

5. age structure _____

6. limiting factor _____

7. carrying capacity _____

PART C Complete the following.

1. Provide an example of a population.

2. Explain the job of population ecologists.

3. List the four factors whose combined effects determine the growth rate of a population.

4. What happens when a resource essential to the growth of a population is in short supply?

5. List five factors that can be considered limiting factors.

6. What happens when the birth rate and the death rate of a population become roughly equal?

PART D Suppose you observed the size of the deer population in an area. You discovered that over a 3-year period, the population changed in the following way: 40 deer were born, 18 deer died, 20 deer migrated into the herd, and 6 deer migrated out of it. On a separate piece of paper, calculate the growth rate, per year, of the population. Be sure to consider changes brought about by immigration and emigration. Show your work.

Limits on Population Growth

Section Review

36.2

The Big Idea

The size of a population is affected by living and nonliving factors. 36.1–36.2

Concepts

- Living space, disease, competition, and predation are density-dependent limiting factors. These factors reduce populations that have exceeded their carrying capacity.
- Seasonal climate changes, natural disasters, and human activity can affect populations regardless of their density. Seasonal changes can produce a boom-and-bust growth pattern. Major upsets can lead to species extinctions.
- The growth rate of the human population has increased dramatically in the last few centuries.

Words

density-dependent limiting factors predation density-independent limiting factors

PART A Compare density-dependent limiting factors and density-independent limiting factors by completing the following tables. In Column A, write the name of the factors. In Column B, give an example for the way the factor functions to limit population growth.

Density-Dependent Limiting Factors

A. Factor	B. Example
1.	
2.	
3.	
4.	

Density-Independent Limiting Factors

A. Factor	B. Example
5.	
6.	
7.	
8.	

PART B Match each term in Column B with its description in Column A. Write the letter of the correct term on the line provided.

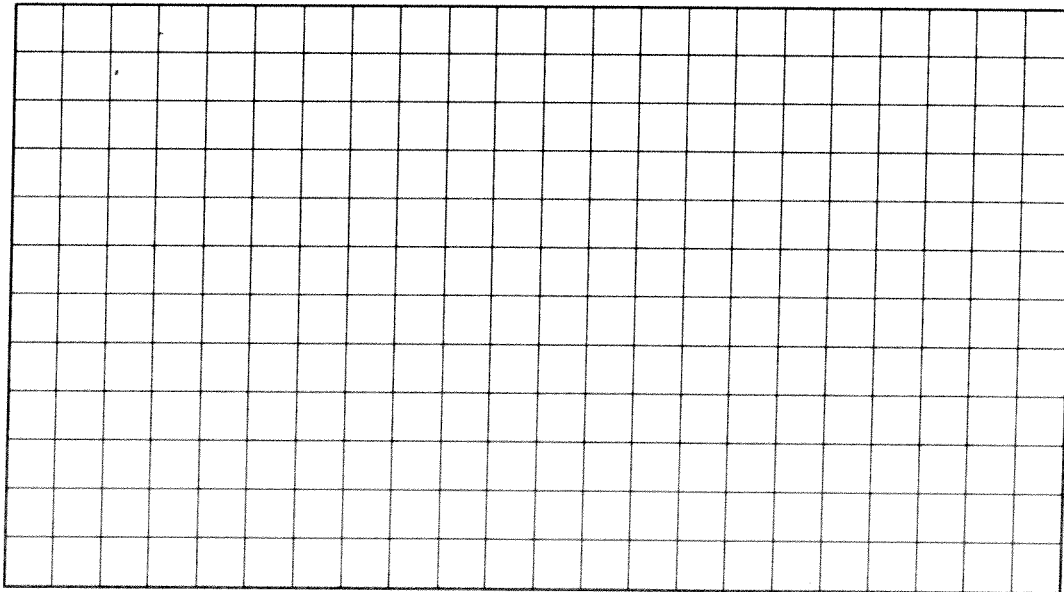
COLUMN A

- _____ 1. species that feeds on another species
- _____ 2. represents a period of exponential growth followed by a sudden collapse of the population
- _____ 3. factors that affect all populations in the same way, regardless of their densities
- _____ 4. factors that limit populations only when population density reaches a certain level
- _____ 5. species that serves as food for another species
- _____ 6. interaction in which a one species feeds on another

COLUMN B

- a. density-dependent limiting factors
- b. predation
- c. predator
- d. prey
- e. density-independent limiting factors
- f. boom-and-bust curve

PART C On the grid shown, draw a graph that represents human population growth over the last 3000 years. What is this type of population growth called?



Characteristics of the Biosphere

Section Review

35.1

The Big Idea

Life depends on the relationships between living and nonliving parts of the environment.
35.1–35.2

Concepts

- Ecologists study the interactions of organisms with their physical environments.
- Levels of organization in the biosphere increase in complexity from individuals to populations, communities, and ecosystems.
- Every environment is comprised of living (biotic) factors and nonliving (abiotic) factors.

Words

ecology biosphere biotic factors abiotic factors population community
ecosystem habitat

PART A Match each term in Column B with its description in Column A. Write the letter of the correct term on the line provided.

COLUMN A

COLUMN B

- _____ 1. nonliving parts of the environment
- _____ 2. study of organisms and their interactions with the environment
- _____ 3. members of a single species that live in an area
- _____ 4. region of Earth that supports life
- _____ 5. all the populations that live and interact in one environment
- _____ 6. type of environment in which a particular species lives
- _____ 7. living parts of the environment
- _____ 8. union of organisms and abiotic factors

- a. abiotic factors
- b. biosphere
- c. ecosystem
- d. population
- e. community
- f. ecology
- g. biotic factors
- h. habitat

PART B Complete the following.

1. List three biotic factors.

2. List three abiotic factors.

3. Explain what makes up the biosphere.

4. Define *biodiversity*.

5. Give two examples of ecosystems.

PART C State whether each of the following ecological studies is at the individual, population, community, or ecosystem level. Then list the biotic and abiotic factors involved.

1. An ecologist studies the hunting behavior of a male spider.

2. A worldwide team of scientists measures the capacity of vegetation to take up carbon dioxide from the atmosphere.

3. A conservation biologist studies the decline of a species of parrots in an isolated rain forest.

4. A soil scientist measures the amount of soil nitrogen available to plants growing in a particular area.

5. The U.S. Forest Service monitors the effect of spring floods on the plants and animals in a National Park.
