Chapter 5 Populations

Section 5–1 How Populations Grow (pages 119–123)

This section identifies the characteristics used to describe a population. It also describes factors that affect population size and explains what exponential growth and logistic growth are.

Characteristics of Populations (page 119)

1. What are the four main characteristics of a population?
   a. Geographic distribution
   b. Density
   c. Growth rate
   d. Age structure

2. What is a population’s geographic distribution? It is the area inhabited by the population.

3. Another term for geographic distribution is _______ range _______

4. What is population density? It is the number of individuals per unit area.

5. What is the equation with which you can calculate population density?
   \[
   \text{Population density} = \frac{\text{Number of individuals}}{\text{Unit area}}
   \]

Population Growth (page 120)

6. Circle the letter of each sentence that is true about populations.
   a. They can grow rapidly.
   b. They can decrease in size.
   c. They may stay the same size from year to year.
   d. They stay the same size until they disappear.

7. What three factors can affect population size?
   a. The number of births
   b. The number of deaths
   c. The number of individuals that enter or leave the population

8. If more individuals are born than die in any period of time, how will the population change? It will grow.

9. Complete the table about changes in population.

<table>
<thead>
<tr>
<th>Type of Change</th>
<th>Definition</th>
<th>Resulting Change in Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immigration</td>
<td>The movement of individuals into an area</td>
<td>The population grows</td>
</tr>
<tr>
<td>Emigration</td>
<td>The movement of individuals out of an area</td>
<td>The population decreases</td>
</tr>
</tbody>
</table>
Exponential Growth (page 121)

10. How will a population change if there is abundant space and food and if the population is protected from predators and disease? The population will multiply, and the population size will increase.

11. When does exponential growth occur? It occurs when individuals in a population reproduce at a constant rate.

12. What are three ways that a growth rate may be stated, or expressed? It may be stated as a doubling time, a birthrate per female, or a percentage of growth per year.

13. Under ideal conditions with unlimited resources, how will a population grow? Such a population would grow exponentially.

14. Complete the graph by drawing the characteristic shape of exponential population growth.

![Exponential Growth of Bacterial Population](image)

15. Is the following sentence true or false? Elephants never grow exponentially because their rate of reproduction is so slow. ________false

Logistic Growth (page 122)

16. Circle each sentence that is true about exponential growth.

a. It continues until the organism covers the planet.

b. It continues at the same rate as resources become less available.

c. It does not continue in natural populations for very long.

d. It continues in natural populations until the birthrate increases.

17. When resources become less available, how does population growth change? It slows or stops.
18. When does logistic growth occur? It occurs when a population’s growth slows or stops following a period of exponential growth.

19. Circle the letter of each instance when a population’s growth will slow down.
   a. The birthrate and death rate are the same.
   b. The birthrate is greater than the death rate.
   c. The rate of immigration is equal to the rate of emigration.
   d. The rate of emigration is less than the rate of immigration.

20. What is the carrying capacity of the environment for a particular species? It is the largest number of individuals that the given environment can support.

21. Complete the graph by drawing the characteristic shape of logistic population growth.