

## Section 16–2 Evolution as Genetic Change

(pages 397–402)



### Key Concepts

- How does natural selection affect single-gene and polygenic traits?
- What is genetic drift?
- What is the Hardy-Weinberg principle?

### Natural Selection on Single-Gene Traits (pages 397–398)

1. Is the following sentence true or false? Natural selection on single-gene traits cannot lead to changes in allele frequencies. \_\_\_\_\_
2. If a trait made an organism less likely to survive and reproduce, what would happen to the allele for that trait? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. If a trait had no effect on an organism’s fitness, what would happen to the allele for that trait? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

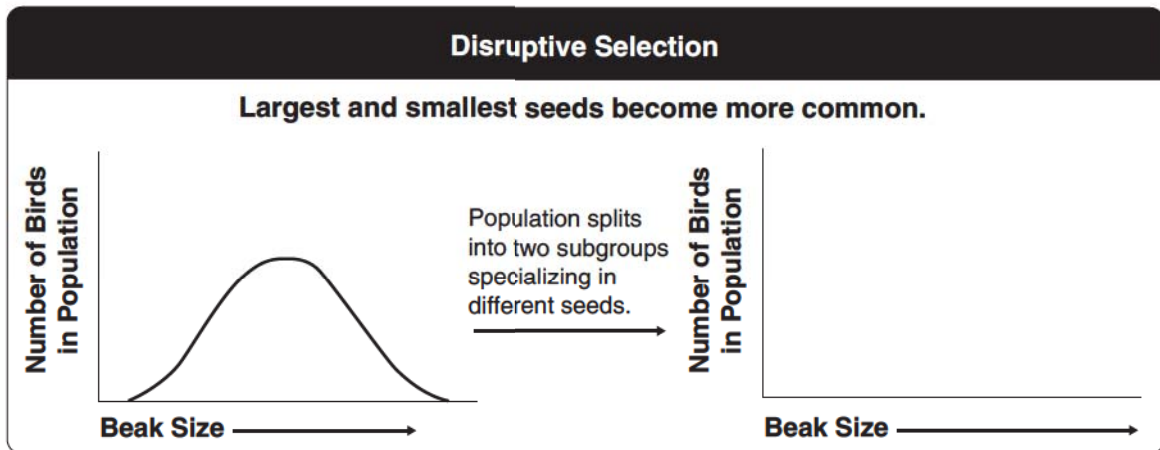
### Natural Selection on Polygenic Traits (pages 398–399)

4. List the three ways that natural selection can affect the distributions of phenotypes.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_

Match the type of selection with the situation in which it occurs.

- | Type of Selection    | Situation  |
|----------------------|--|
| _____ 5. Directional | a. Individuals at the upper and lower ends of the curve have higher fitness than individuals near the middle.  |
| _____ 6. Stabilizing | b. Individuals at one end of the curve have higher fitness than individuals in the middle or at the other end. |
| _____ 7. Disruptive  | c. Individuals near the center of the curve have higher fitness than individuals at either end.                |
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8. An increase in the average size of beaks in Galápagos finches is an example of \_\_\_\_\_ selection.
  9. Is the following sentence true or false? The weight of human infants at birth is under the influence of disruptive selection. \_\_\_\_\_

10. Draw the missing graph to show how disruptive selection affects beak size.



**Genetic Drift (page 400)**

11. Is the following sentence true or false? Natural selection is the only source of evolutionary change. \_\_\_\_\_
12. Random change in allele frequencies in small populations is called \_\_\_\_\_.
13. A situation in which allele frequencies change as a result of the migration of a small subgroup of a population is known as the \_\_\_\_\_.
14. What is an example of the founder effect? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**Evolution Versus Genetic Equilibrium (page 401–402)**

15. What does the Hardy-Weinberg principle state? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
16. The situation in which allele frequencies remain constant is called \_\_\_\_\_.
17. List and describe the five conditions required to maintain genetic equilibrium.
  - a. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
  - b. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

c. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

d. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

e. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

18. Is it common for a population to remain in genetic equilibrium? Explain your answer.

\_\_\_\_\_  
\_\_\_\_\_

**Reading Skill Practice**

When you read about related concepts, making a graphic organizer such as a Venn diagram can help you focus on their similarities and differences. Make a Venn diagram comparing and contrasting single-gene and polygenic traits. For more information on Venn diagrams, see Appendix A of your textbook. Do your work on a separate sheet of paper.