## **Chapter 16 Evolution of Populations**

## **Multiple Choice**

*Write the letter on the line provided that best answers the question or completes the statement.* 

- \_ 1. The combined genetic information of all members of a particular population is the population's a. relative frequency. c. genotype. b. phenotype. d. gene pool. **2.** A change in a sequence of DNA is called a a. recombination. c. single-gene trait. b. polygenic trait. d. mutation. \_ 3. The two main sources of genetic variation are a. genotypes and phenotypes. b. gene shuffling and mutations. c. single-gene traits and polygenic traits. d. directional selection and disruptive selection. 4. An example of a single-gene trait is a. a widow's peak in humans. b. the weight of human infants at birth. c. height in humans. d. beak size in the Galápagos finches. \_ 5. The number of phenotypes produced for a given trait depends upon a. the number of genes that control the trait. b. which form of the trait is dominant. c. the relative frequencies of the various alleles. d. whether or not natural selection is at work. 6. The distribution of phenotypes for a typical polygenic trait can often be expressed as a. a bar graph. b. a bell-shaped curve. c. Mendelian ratios. d. allele frequencies. \_ 7. Natural selection acts directly on a. alleles. c. phenotypes. b. genes. d. mutations. **8.** Which of the following is NOT a way in which natural selection affects the distribution of phenotypes? a. directional selection b. stabilizing selection
  - c. disruptive selection
  - d. chance events

Name	Class	Date
9. In genetic drift, alle	ele frequencies change because of	
a. mutations.	c. natural selection.	
b. chance.	d. genetic equilibrium.	
<b>10.</b> Which of the follow random change?	ving events do biologists consider a	
a. directional select	tion	
b. speciation		
c. disruptive select	ion	
d. genetic drift		
11. The situation in wh remain constant is	nich allele frequencies of a populatio called	n
a. evolution.	c. genetic equilibrium.	
b. genetic drift.	d. natural selection.	
12. One of the condition equilibrium is	ons required to maintain genetic	
a. natural selection		
b. mutations.		
c. nonrandom mat	ing.	
d. no movement in	to or out of the population.	
13. The separation of p mountains, or bodi	oopulations by barriers such as river les of water is called	s,
a. temporal isolatio	on.	
b. geographic isola	tion.	
c. behavioral isolat	ion.	
d. genetic equilibri	um.	
<b>14.</b> A factor that is nec	essary for the formation of a new sp	ecies is
a. reproduction at o	different times.	
c. different mating	behaviors.	
b. geographic barri	ers.	
d. reproductive iso	lation.	
15. Which is the first st Galápagos finches?	tep that occurred in the speciation of	f the
a. establishment of	genetic equilibrium	
b. behavioral isolat	ion	
c. ecological compe	etition	
d. arrival of the fou	inding population	
Completion		
Complete each statement on th	ha line provided	
Complete each statement on th	ie une proviueu.	

- **16.** A gene pool typically contains two or more \_\_\_\_\_\_ for each gene.
- **17.** Inheritable traits can be classified as either \_\_\_\_\_\_ traits or polygenic traits.

Name	Class	Date
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- **18.** For \_\_\_\_\_\_\_ traits, natural selection can affect the distribution of phenotypes in three ways.
- **19.** According to the \_\_\_\_\_\_ principle, allele frequencies in a population will remain constant unless one or more of five specific factors cause those frequencies to change.
- **20.** For new species to evolve, populations must be \_\_\_\_\_\_\_ isolated from each other.

## **Short Answer**

*Write the answers to the questions in complete sentences on the lines provided.* 

- **21.** Are the members of a population necessarily the same species? Explain.
- **22.** What are the two main sources of genetic variation? Which of them is more common?
- **23.** Explain how stabilizing selection would affect a graph of the distribution of phenotypes for a trait.
- **24.** Why might genetic drift occur if a small number of individuals colonized a new habitat?

**25.** What are three mechanisms for reproductive isolation? Which mechanism isolates two populations of similar frogs with different mating calls?

Class\_

Date \_\_\_\_\_

## **Using Science Skills**

*Use the graph below to answer the following questions on the lines provided.* 



- **26. Interpreting Graphics** Describe the information about frog species that is shown in Figure 16-1.
- **27. Interpreting Graphics** According to Figure 16-1, there is a brief period during which frog mating nearly stops. When does this occur?
- **28. Inferring** Based on Figure 16-1, what mechanism appears to keep bullfrogs reproductively isolated? Would that mechanism necessarily be the only isolating mechanism? Explain.
- **29. Inferring** Peeper frogs and leopard frogs do not interbreed even when they share a habitat. Use the information in Figure 16-1 to determine what mechanism probably keeps the two species reproductively isolated.
- **30. Predicting** Frog mating does not occur in cold weather. Assume that the mating times shown in Figure 16-1 are for frogs in the northern part of the United States. How might these curves change for frogs in the southern part of the United States? Explain.