

Name _____ Period _____

Chapter 24: The Origin of Species*Overview*

1. What was Darwin's "mystery of mysteries"?
2. Define *speciation*.
3. Distinguish between *microevolution* and *macroevolution*.

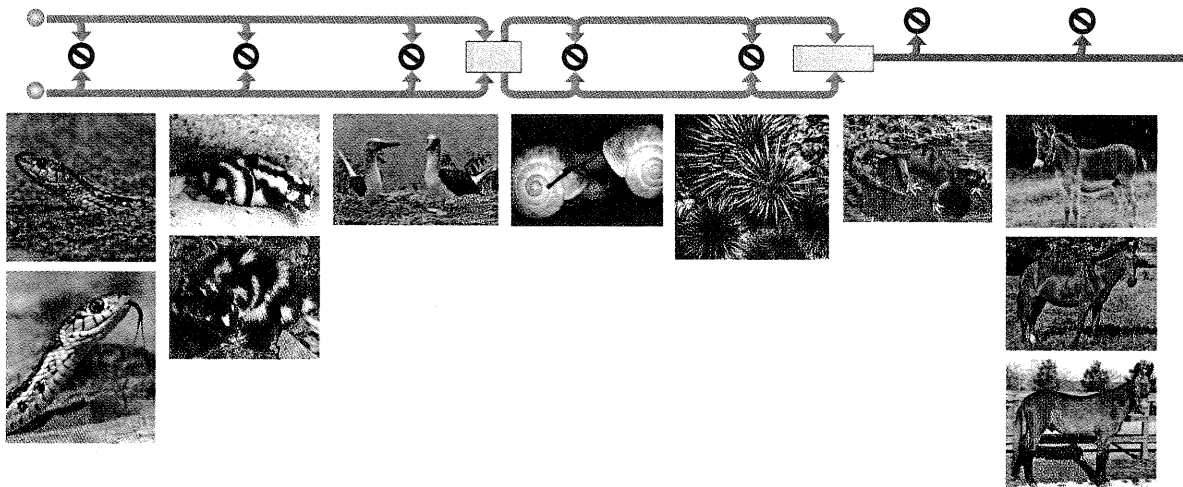
Concept 24.1 *The biological species concept emphasizes reproductive isolation*

4. Use the biological species concept to define *species*.
5. What is required for the formation of new species?
6. What are *hybrids*?
7. Explain the two types of barriers that maintain *reproductive isolation*.
8. The following charts summarize the various ways that *reproductive isolation* is maintained. Explain and give an example of each type of isolating mechanism.

| Prezygotic Reproductive Barriers | Explanation | Example |
|----------------------------------|-------------|---------|
| Habitat isolation | | |
| Temporal isolation | | |
| Behavioral isolation | | |
| Mechanical isolation | | |
| Gametic isolation | | |

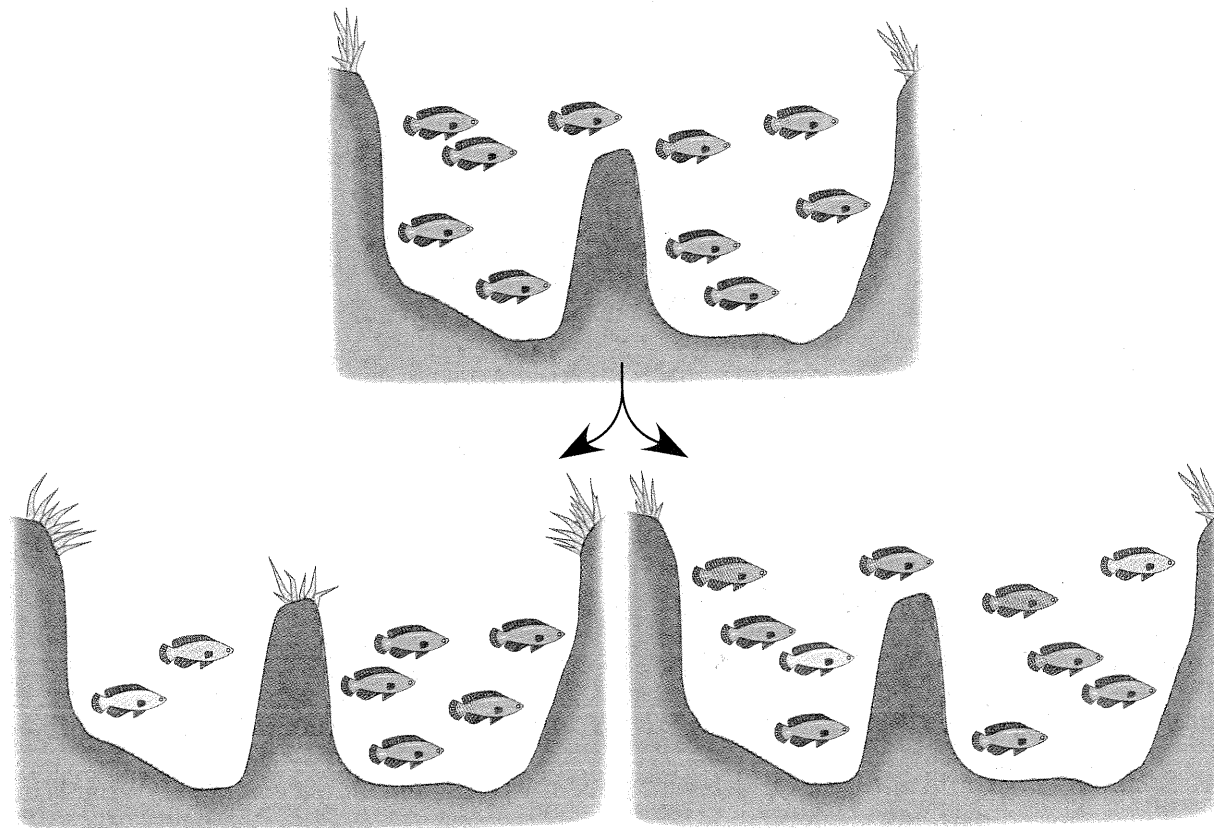
| Postzygotic Reproductive Barriers | Explanation | Example |
|-----------------------------------|-------------|---------|
| Reduced hybrid viability | | |
| Reduced hybrid fertility | | |
| Hybrid breakdown | | |

9. The concept of reproductive isolation is essential for an understanding of speciation, so we are going to have you look at it again. Refer to Figure 24.3 in your text, and label the following sketch. Name each type of isolating mechanism.

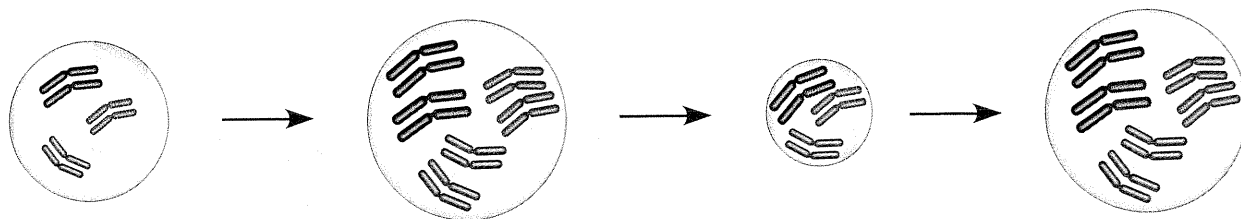


Concept 24.2 Speciation can take place with or without geographic separation

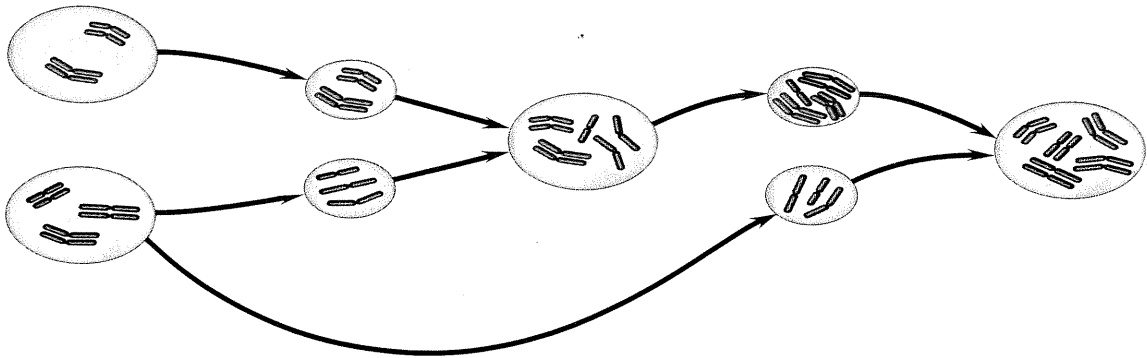
10. Gene flow can be interrupted in two main ways. Explain and give an example of each by labeling and annotating this figure, which shows an ancestral species of fish and then the two modes of speciation.



11. What type of speciation is caused by a barrier such as the Grand Canyon? _____.
12. *Sympatric speciation* occurs in populations that live in the same geographic area. How is this possible?
13. Your response to question 12 should have listed *polyploidy*, *habitat differentiation*, and *sexual selection*. These are not easy concepts to understand, so let's spend some time with each of them. To begin, use the following figure to explain *autopolyploidy*.



14. Now, use this figure to explain *allopolyploid speciation*.



15. Before we leave allopatric and sympatric speciation, explain what happens in *sexual selection*, and how this process can drive sympatric speciation.

Concept 24.3 Hybrid zones provide opportunities to study factors that cause reproductive isolation

16. What are *hybrid zones*?

Concept 24.4 Speciation can occur rapidly or slowly, and it can result from changes in few or many genes

17. Stephen Jay Gould and Niles Eldredge coined the term *punctuated equilibria*. What is meant by a punctuated pattern?

18. Label this figure, and explain how each of the pictures explains speciation.



Test Your Understanding Answers

Now you should be ready to test your knowledge. Place your answers here:

1. _____ 2. _____ 3. _____ 4. _____ 5. _____

6. _____ 7. _____