**Evolution Study Guide**

1. What is the theory evolution?
2. What is natural selection? Who proposed Evolution through natural selection?
3. Give an example of natural selection in action.
4. What evidence is available today that Darwin did not have access to during his time?
5. Define adaptation and give examples.
6. What cause adaptations and how do they help with an organism survival?
7. Explain how natural selection, adaptation, and survival are all interrelated?
8. Define species.
9. What is speciation? Give an example.
10. Describe how populations of organisms are limited?
11. What is a fossil and where are they commonly found?
12. What does the fossil record provide scientist?
13. What types of plant and animal parts are usually found in fossils?
14. Fossils have been found that look similar to organisms today. What does this tell scientist?
15. What are the pieces of evidence that support evolution from a common ancestor?
16. Eagles have keen eyesight that allows them to spot mice and other prey while soaring high above the ground. How would a biologist explain how eagles evolved their keen eye sight, assuming their ancestors had less keen eyesight?
17. Cheetahs are able to run faster than 60 miles per hour when chasing prey. How would a biologist explain how the ability to run this fast evolved in cheetahs, assuming their ancestors could only run 20 miles per hour?
18. Polar bears have white fur that blends in well with their snowy surroundings. This helps polar bears stalk and hunt seals. Polar bears are believed to have evolved from bears that had brown fur. How would a biologist explain how the white fur of polar bears evolved from bears with brown fur?
19. A ship that had been used for many years in arctic exploration was sold and moved to a harbor in the warm waters of the Caribbean. Worms that had lived on the ship bottom crawled off in the warm waters and attempted to attach to other ships in this tropical area where there were no similar worms. Some of the worms were able to survive and reproduce. What would you expect to happen to this group of worms over many generations in this new environment?
20. The worms will mate and produce offspring just as they did in their previous environment, and the group’s traits will likely remain unchanged after many generations.
21. The worms will gain new, more complex traits through natural selection that will help them better adapt to the warmer waters because natural selection leads to more complex and better adapted organisms.
22. Worms possessing genetic variations that help them to survive and thrive in the new environment will leave more offspring than others lacking those traits. Over time, the proportion of the worm population with these adaptive traits will likely increase.
23. The mutation rate will increase in this group of worms in order to promote evolution.
24. *Bacillus thuringienses* (Bt) bacteria produce a natural insecticide. Widespread use of Bt has led to Bt resistance among insects. Why is this occurring?
25. Individual insects that have mutations providing resistance to Bt can survive in the presence of Bt. The survivors pass this Bt resistance on to their offspring.
26. Bt-resistant insects increase in the population by chance. There are so many insects that some of them are resistant to each type of insecticide.
27. In the presence of Bt, individual insects evolve to become Bt resistant.
28. Natural selection causes insects to generate genes providing resistance to Bt.

