Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

-Compare adaptations and variation within the dark peppered moth.

-Explain how species change through the FOUR steps of Natural Selection.

-Interpret a diagram of fossil layers as evidence for evolution.

-Explain how similarities in the fore-limb bones of different animals are used as evidence for evolution.

Period\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 **DIRECTED READING CHAPTER 7 pages 150-167**

 Natural Selection/Change Over Time

**Pages 150-151**

1. Look at Figure 1-3 on page 150. How does being bright red help the strawberry dart-

 poison frog survive? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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

2. Can strawberry dart-poison frogs mate with red-eyed tree frogs to produce offspring?

 \_\_\_\_\_\_\_\_ Why or why not? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

3. Write the definition of adaptation. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

4. Write the definition of species. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

5. Evolution is the process by which populations accumulate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changes

 over time.

**Page 152, 153, 156, 157**

6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_are solidified remains

 or imprints of once-living organisms and are found in layers such as Figure 1.

7. Fossils are usually found in layered rock called

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

8. Fossils in level 1 are the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forms of life that may now be extinct.

Figure 1



5

4

3

2

5

4

3

2

1

9. Which of the following are reasons that scientists think whales evolved from doglike land dwellers? (Circle all that apply.)

 **a.** Whales are mammals.

 **b.** Whales have vestigial hind-limb bones.

 **c.** Whales bark like dogs.

 **d.** There is fossil evidence to support evolution from doglike landdwellers.

 **e.** Whales are shaped like fish.

10. Remnants of once-useful structures are known as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

11. In Figure 9, the bones in the front limbs of these animals are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, even though the limbs are used in different ways. These similarities support the theory

 of evolution by inferring that all are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_by a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ancestory.

12. Scientists can also compare \_\_\_\_\_\_\_\_\_\_\_\_from different species and

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_structures.

**Page 158**

13. What is one scientific discovery that occurred during the early 1800s?\_\_\_\_\_\_\_\_\_\_\_\_\_

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

14. Darwin’s father wanted Darwin to become a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but Darwin earned a

 degree in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ instead. Later, Darwin was the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_on

 the HMS \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

15. Darwin made observations on this five year journey that later became the foundation for

 his theory of evolution by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Page 159**

16. The Galápagos Islands are near the country of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

17. Look at Figure 13. Describe the beak of each of the finches listed below and explain how

 the adaptation helps the finch find food in the Galápagos Islands.

 a. ground finch \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

 b. cactus finch \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

 c. warbler finch \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Page 160-161**

18. Darwin’s hypothesis was that the Galápagos finches were descended from an original

 population of finches that was \_\_\_\_\_\_\_\_\_\_\_\_\_\_ from \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_

 to the Galápagos Islands.

19. A procedure wherein humans select which traits will be passed along to the next

 generation is called \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Column B lists some sources of ideas Darwin used to develop his theory of evolution. Column A lists some of the ideas that contributed to the theory. Choose the appropriate source in Column B for the idea in Column A, and write the corresponding letter in the space provided. **Sources can be used more than once.**

|  |  |
| --- | --- |
| **Column A** | **Column B** |
| \_\_\_ 20. The Earth was formed over a long period of time.\_\_\_ 21. Species can produce more offspring than can survive.\_\_\_ 22. Changes in animals and plants can happen in a few  generations.\_\_\_ 23. Selective breeding produces individuals with certain traits.\_\_\_ 24. Disease and starvation affect populations. | a. farmers and breedersb. geologistsc. Thomas Malthus |

**Page 162**

25. Charles Darwin and \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ arrived at the same theory of

 evolution.

26. In 1859, Darwin published his results in his book called ***On the Origin of Species by***

 ***Means of*** \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

27. List the four steps of Natural Selection:

 a. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

 d \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

28. Which of the four is the key to natural selection? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Explain why. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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

**Page 163**

29. Which of the following points was added to Darwin’s theory of evolution during the 1930s

 and 1940s?

 a. Parents pass traits to their offspring.

 b. Variations within a species are caused by mutations.

 c. Changes in genes cannot occur.

 d. Changes in species occur over time.

30. Mutation refers to changes in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Page 164-165**

31. A shorter generation time helps a population adapt \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

32. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_in a population’s characteristics helps ensure that some individuals

 will be able to survive a change in the environment.

33. After the 1850s, the \_\_\_\_\_\_\_\_\_\_\_\_\_peppered moth population increased because

 pollution altered its environment.

**Pages 166-167**

34. The process of speciation often begins when a portion of a population becomes isolated.

List three ways this could happen: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

35. Separated groups may \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_to better fit their environment over many generations.

36. Two groups of related living things are no longer considered to be the same species when

 a. they can no longer interbred.

 b. they do not eat the same food.

 c. they do not look the same.

 d. they become physically separated from each other.

37. When two groups of a population may become so different that they can no longer

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, even if the geographical barrier is removed, the two

 groups are no longer the same \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

38. Place the following steps of speciation in the correct order by writing the appropriate number in the space provided.

 \_\_\_\_ The environments around the populations change and population adapt over time.

 \_\_\_\_ The populations become different species.

 \_\_\_\_ Populations are separated.