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Evolution

Use pages 236-251 in your “Bee Textbook” to complete this reading guide.

1. What is the definition of a **theory**?
2. Darwin’s theory of evolution contains two major ideas, what are they (in detail)?

Idea 1-

Idea 2-

1. List 2 things that people believed in Darwin’s time.

Belief 1-

Belief 1-

1. In \_\_\_\_\_\_ , when Darwin was just \_\_\_ years old, he set sail as part of a scientific expedition on the ship called \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_. . He was the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_on the voyage. As a

naturalist, it was his job to observe and collect specimens of \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wherever the expedition went ashore.

1. Darwin made many observations to helped him form his theory of evolution, list two examples.

Example 1-

Example 2-

1. Where were Darwin’s most important observations made?
2. Describe the islands.
3. Scientists Who Influenced Darwin:
	1. Jean Baptiste Lamarck: He was one of the first scientists to propose that species
	\_\_\_\_\_\_\_\_\_\_\_\_\_\_ over time. His idea of inheritance of \_\_\_\_\_\_\_\_\_\_\_\_ characteristics is incorrect. Traits an organism develops during its \_\_\_\_\_\_\_\_\_\_\_\_ life time cannot be passed on to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
	2. Charles Lyell: Geologist, Lyell inferred that Earth must be far \_\_\_\_\_\_\_\_\_\_ than most people believed.
	3. Thomas Malthus: Argued that human \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ grow faster than the resources they depend on. When populations become too \_\_\_\_\_\_\_\_\_\_\_, famine and disease break out. In the end, this keeps populations in check by killing off the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ members.
4. What is **selective breeding (artificial selection)?**
5. Give a specific example of what could be accomplished with selective breeding.
6. **Progression of Darwin’s Theory:**

1. Like \_\_\_\_\_\_\_\_\_\_\_\_\_, Darwin assumed that species can \_\_\_\_\_\_\_\_\_\_\_ over time. The \_\_\_\_\_\_\_\_\_\_

 he found helped convince him of that.

2. From Lyell, Darwin saw that Earth and its life were very \_\_\_\_\_\_\_\_\_. Thus, there had

 been enough \_\_\_\_\_\_\_\_\_\_\_\_\_ for evolution to produce the great diversity of life Darwin had observed.

3. From Malthus, Darwin knew that populations could grow faster than their

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This “overproduction of offspring” led to “\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_,” in Darwin’s words.

4. From \_\_\_\_\_\_\_\_\_\_\_\_\_\_ selection, Darwin knew that some offspring have chance

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that can be inherited. In nature, offspring with certain variations might

 be more likely to \_\_\_\_\_\_\_\_\_\_\_\_\_ the “struggle for existence” and reproduce. If so, they

 would pass their favorable variations to their offspring.

5. Darwin coined the term \_\_\_\_\_\_\_\_\_\_\_\_\_\_ to refer to an organism’s relative ability to survive

 and produce \_\_\_\_\_\_\_\_\_\_\_\_\_ offspring. Nature selects the variations that are most useful.

 Therefore, he called this type of selection \_\_\_\_\_\_\_\_\_\_\_\_\_ selection.

6. Darwin knew artificial selection could change domestic species over time. He

 inferred that natural selection could also \_\_\_\_\_\_\_\_\_\_\_\_ species over time. In fact, he

 thought that if a species changed enough, it might \_\_\_\_\_\_\_\_\_\_\_\_ into a new species.

1. What was Wallace’s Theory?
2. What did Wallace send Darwin that encouraged him to finish and publish his book?
3. **Applying Darwin’s Theory:**

 In the past, giraffes had \_\_\_\_\_\_\_\_ necks. But there was chance \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in neck

length. Some giraffes had necks a little longer than the average. Then, as now, giraffes fed on tree leaves. Perhaps the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ changed, and leaves became scarcer. There would be more giraffes than the trees could support. Thus, there would be a “\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.”

Giraffes with longer necks had an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They could reach leaves other giraffes could not. Therefore, the long-necked giraffes were more likely to survive and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. They had greater fitness. These giraffes passed the long-neck trait to their offspring. Each generation, the

population contained more long-necked giraffes. Eventually, all giraffes had \_\_\_\_\_\_\_\_\_\_\_\_\_ necks.

1. **Evidence from Living Species**:

Just as Darwin did, today’s scientists study living species to learn about evolution. They compare the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_ of modern organisms to understand how they evolved.

1. What is a homologous structure?
2. Give an example.
3. What is an analogous structure?
4. Give an example.
5. What can we learn from comparative embryology?
6. What is a vestigial structure?
7. Give an example.
8. Evidence from Biogeography
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the study of how and why plants and animals live where they do. It

provides more evidence for evolution.

1. The biogeography of \_\_\_\_\_\_\_\_\_\_\_ yields some of the best evidence for evolution. Consider the

birds called \_\_\_\_\_\_\_\_\_\_ that Darwin studied on the Galápagos Islands. All of the finches probably descended from \_\_\_\_\_\_\_ bird that arrived on the islands from South America. Until the first bird arrived, there had never been birds on the islands. The first bird was a \_\_\_\_\_\_\_\_ eater. It evolved into many finch species. Each species was adapted for a different type of \_\_\_\_\_\_\_\_\_. This is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ radiation. This is the process by which a single species evolves into \_\_\_\_\_\_\_\_\_\_\_\_ new species to fill available \_\_\_\_\_\_\_\_\_\_\_\_.