Chapter 9 Notes

9.1 Darwin’s Theory

Darwin- a naturalist, a person that observes & studies the natural world.

“While on a 5-year voyage around the world, he noticed animals were different than what he knew in England.”

Species- a group of similar organisms that can mate with each other and produce fertile offspring.

“As of today, scientists have discovered over 1.6 million different organisms on Earth”

Fossils- the preserved remains or traces of an organism that lived in the past. “Darwin saw fossils of different animals but became puzzled when he realized they resembled current animals but were different in size. He began to wonder why some of the larger animals weren’t around today, but smaller versions of them existed.”

“The ship Darwin was traveling on stopped in many places along the Atlantic and Pacific coasts of South America. The ship stopped at the Galapagos Islands. Here, Darwin observed many unusual life forms. Darwin started to compare animals here to animals from back home in England and then other parts of the world, including other islands. He noticed that animals on the island resembled animals on the main land of South America, which was the nearest continent. “

“why do you think an island would be a good place to study how a species changes over time? (isolation from the main land)”

Galapagos- observations made here led to Darwin’s idea that species’ do not always stay the same. \*\*Instead, he thought species could change and even produce new species over time.

Adaptations- a trait that increases an organism’s ability to survive and reproduce. Turn book to page 357 & read the paragraph “adaptations.”

“in science, adaptations are not a choice the organism makes. The finches did not grow different beaks because they wanted to.”

Darwin’s Hypothesis- organism change over time. The process of change over time is called evolution.

“Darwin wanted to know how organisms change so over the next 20 years, he consulted with other scientists and gathered more information.”

\*\*Darwin hypothesized that species change over many generations and become better adapted to new conditions. This idea is known as the “theory of evolution.”

Scientific theory- well-tested concept that explains a wide range of observations.

Pg, 359 assess your understanding

Natural Selection- process in which individuals that are better adapted to their environment are more likely to survive and reproduce more than other members of the same species.

Factors that affect the process of natural selection: overproduction, variation, and competition.

Overproduction: producing more offspring than what is expected to survive. EX: sea turtles.

Variation: any difference between individuals of the same species Ex: sea turtles may have different colors, size, ability to swim quickly, and shell hardness.

Competition- food, space, and other resources are limited so a species may compete with each other for those things. EX: turtles finding food to eat.

“Darwin observes that some variations make individuals better adapted to their environment. Those individuals are more likely to survive and reproduce. Thus, allowing the characteristics to be passed on to new generations.”

Darwin proposed that, over a long time, natural selection can lead to a change. Helpful variations may accumulate in a species, while unfavorable ones may disappear.

“Without variations, all the members of a species would have the same traits and the same chance of surviving and reproducing. Darwin could not explain what caused variations or how they were passed on. Who do we know that studied genes and inheritance? (Mendel)

Watch video on Mendel & Darwin:

<https://www.youtube.com/watch?v=WhFKPaRnTdQ>

pg. 363 assess your understanding

9.2 Evidence of evolution

Fossils, patterns of early development, similar body structures, and similarities in DNA & protein structures all provide evidence that organisms have changed over time.

Fossil record- The millions of fossils that scientists have collected

\*Provide clues about how and when an organism evolved and how organisms are related.

Similar structures that related species have inherited from a common ancestor is known as homologous structures.

Similar DNA: linking organisms to one ancestor. EX: dogs are closely related to wolves.

9.3 Rate of Change