**EVOLUTION UNIT GUIDE ANSWERS**

**Recall and Review:** Use the videos and your textbook to help you answer the following questions.

**Section 10.2**

1. Describe the difference between a variation and an adaptation.

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| Variation | Adaptation |
| **differences** in the physical traits of an individual from those of other individuals in the group to which it belongs | feature that allows an organism to better survive and reproduce in its environment: an **advantage** |

1. Explain why tortoises of the same species look different

They live in different areas and those organisms possess variations that allow them to be most successful in their particular area.

1. List two things Darwin learned from his trip to the Galapagos.
2. Organisms within the same species have a lot of variety; those variations may become an adaptation that allows them to better survive and reproduce.
3. Fossil evidence showed species changing over time.

**Section 10.3**

1. State the four main principles of natural selection.
2. Variation
3. Overproduction /Competition
4. Adaptation
5. Descent with modification
6. Briefly explain how each of the above principles is necessary for natural selection to occur.

In order for there to be a reason for natural selection, there have to be more individuals present than the environment can support. Because of this, there is competition between the organisms. Those with variations that give them an advantage will be more likely to survive and reproduce. Therefor their descendant will inherit those modifications.

**Section 10.4**

1. Describe the four sources of evidence for evolution upon which Darwin based his ideas on common ancestry.
2. Fossil Record
3. Biogeography
4. Developmental (Embryology)
5. Comparative Anatomy
6. Why are vestigial structures considered critical evidence of evolution? Give an example of a vestigial structure.

Because they are structures that we still possess in our bodies but yet there is little to no function needed for them anymore. An example is the small pelvis found in snakes and whales.

1. Describe the difference between homologous and analogous structures.

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| Homologous | Analogous |
| those in which the structure is similar but they may have a completely different function. For example, bat wings and human arms | those in which the structure is very different but they are used for the same function, bat wings and insect wings. |

**Section 10.5**

1. Explain how paleontology is important to evolutionary biology.

Paleontology is important to biology because the fossils are a good way to examine extinct organisms to see what relationships existed a long time ago.

1. How has molecular genetics, combined with paleontology, added to our understanding of evolution?

Molecular genetics allows us to make comparisons of the DNA structure and protein created from it. For example, we can examine the amino acids that make up a particular protein and count the number that are the same and different for a variety of species. This could then be used to figure out which ones are the most closely related. Combining this with the ability to examine fossils can help to map out evolution.

1. Describe how similar protein comparisons of cells in two species can suggest a close evolutionary relationship.

The more similar the proteins then the more similar the DNA since the protein is transcribed and translated from the DNA.

**Section 11.1**

1. Why does genetic variation increase the chance that some individuals in a population will survive.

The greater the variation of phenotypes in a population, the more likely it is that some individuals can survive a changing environment.

1. Describe two main sources of genetic variation.

Mutation- a random change in the DNA of a gene. Recombination-new allele combinations form

in offspring through sexual reproduction.

**Section 11.6**

1. Explain what it means to say that natural selection is not random.

Natural selection is not random because with each generation, variations present are chosen for, meaning that certain variation are carried on to next generation because they provide an advantage for the individual.

1. How does coevolution shape two species over time?

When tow or more species are dependent on each other each might evolve in response to changes in the other. For example, if a bee pollinates a particular kind of flower and over the course of many generations the shape of the flower changes, the bees that possess a variation which allows them to continue to “fit” into the flower will be selected for and the species will evolve.

1. Describe the difference between convergent and divergent evolution.

Convergent evolution is when you have two species that do not share a common ancestor but do share similar physical characteristics. It is the result of the environment selecting particular individuals based on the characteristics needed to be successful.

Divergent evolution is when you have two species that are from a common ancestor. They have branched out from the ancestor based on the characteristics necessary for their environment.

**Section 12.1**

1. Why are so few complete fossils discovered?

Very few fossils form because conditions have to be just right or the organism will decompose.

Then natural events such as earthquakes, floods and volacanoes can destroy or scatter fossils that

took thousands of years to form.

**Section 12.2**

1. What is the usefulness of categorizing Earth’s history into the geologic time scale?

It enables us to make comparisons of organisms that have lived over different eras and make predictions on how new species evolved.