EOC Evolution Review - Key

1. The slow, gradual change in a species is called \_\_\_\_\_***evolution***\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Define the following terms and give an example of each
	1. Homologous Structure – ***Similar anatomical structures (human arm, dolphin flipper), different function.***
	2. Analogous Structure – ***Similar function, different anatomical structures (bird wing, butterfly wing)***
	3. Vestigial Structure – ***Structure that no longer serves a purpose (hip bones on whale)***
3. What is natural selection? Who proposed the Theory of Evolution through natural selection?

***Natural selection is the process through which organisms best adapted to their environment survive and reproduce, passing on their beneficial adaptations to future generations. Charles Darwin.***

1. Give an example of natural selection

***Insects becoming resistant to pesticides over many generations.***

1. What is “survival of the fittest”?

***Organisms best adapted to their environment are more likely to survive and reproduce.***

1. Explain how natural selection, adaptation, and fitness are related to one another.

***More “fit” (well adapted) organisms are more likely to be “selected” by nature, meaning they will survive and reproduce.***

1. What is convergent evolution? Give an example.

***Evolution through which organisms become more similar. Marsupials in different parts of the world evolving similar traits.***

1. What is divergent evolution? Give an example.

***Evolution through which organisms become more different. The finches of the Galapagos Islands.***

1. What is stabilizing selection? Draw a graph and give an example.

***Selection against both extremes and towards the median. Example: human birth weight.***

1. What is disruptive selection? Draw a graph and give an example.

***Selection against the mean and towards both extremes. Example: snake color***

1. What is directional selection? Draw a graph and give an example.

***Selection against one extreme and towards another.***

1. What is speciation? List two ways that speciation can occur.

***Speciation is the process of evolution which results in the new species. Speciation occurs as a result of geographic isolation and genetic drift.***

1. What is a mutation? How does it contribute to adaptation?

***Any change in a genetic sequence. Natural selection acts upon traits controlled by genes, so new traits can appear as a result of mutations.***

1. What was the first type of cell on Earth?\_\_\_***prokaryotic bacteria cell***\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Define the following terms:
	1. Mimicry – ***when one species develops adaptations similar to another***
	2. Camouflage – ***adaptations that allow an organism to blend in with its environment***
3. List and define the three factors that influence natural selection
	1. \_\_\_***overproduction\_\_\_: more offspring are produced than can possibly survive***
	2. \_\_\_***competition\_\_\_: organisms trying to utilize the same resources***
	3. \_\_\_***variation\_\_\_: genetic differences between organisms of the same species***
4. Describe how antibiotic resistance occurs

***Antibiotics are taken to kill bacteria. Some bacteria have natural, genetic immunities to the antibiotics. Those bacteria survive and reproduce, creating a future generation of bacteria that is entirely resistant to the antibiotic.***

1. Define the following terms:
	1. Relative Dating – ***“dating” of fossils using the sediment layer. Oldest at bottom.***
	2. Absolute (Radiometric Dating – ***exact dating of fossils using process such as carbon dating***
2. What are the two factors that determine whether organisms are a separate species or not?

***Whether or not they can produce fertile offspring, whether or not they can reproduce in their natural habitat***

1. This diagram shows what rate of speciation? Define it.

***Punctuated equilibrium – long periods of no change followed by short, rapid bursts of change***

1. This diagram shows what rate of speciation? Define it.

***Gradualism – long periods of slow, gradual change, leading to the development of new species***

1. Put the fossils in order from oldest to youngest based on the diagram below.

 ***5 (Oldest) – 3 – 1 – 4 – 2 (youngest)***

Please answer the following questions using the choices provided. Choices may be used more than once.

1. Homologous Structure
2. Analogous Structure
3. Vestigial Structure
4. Molecular/Biochemical Evidence
5. Fossil Evidence
6. Embryological Evidence
7. A modified structure seen among different groups of descendants.\_\_\_\_\_\_\_\_\_***A***\_\_\_\_\_\_\_\_
8. In the earliest stages of development, a tail and gill slits can be seen rabbits, fish, birds, and humans.\_\_\_\_***F***\_\_\_
9. Exemplified by forelimbs of bats, penguins, lizards, and monkeys.\_\_\_\_\_\_***A***\_\_\_\_\_\_\_\_
10. The forelimbs of flightless birds.\_\_\_\_\_***C***\_\_\_\_\_\_\_\_
11. DNA and RNA comparisons may lead to evolutionary trees or cladograms.\_\_\_\_\_\_\_***D***\_\_\_\_\_\_\_\_\_
12. Bird and butterfly wings have the function but different structure.\_\_\_\_\_\_\_***B***\_\_\_\_\_\_\_\_\_\_\_
13. A body structure no longer used but may have had a function in an early ancestor.\_\_\_\_\_\_\_\_\_***C***\_\_\_\_\_\_\_\_\_\_
14. Structure associated with divergent evolution.\_\_\_\_\_***A\_\_\_\_\_\_\_\_\_***
15. Structure associated with convergent evolution.\_\_\_\_\_\_***B***\_\_\_\_\_\_\_\_\_

*Use the following diagram to answer questions 32-38*

reptiles

amphibians



dimetrodon

T-Rex

whale

fish

shark

Y

1. The above diagram is called a \_\_\_\_\_\_\_***cladogram***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In the diagram above, the Y axis represent what?\_\_\_\_\_\_\_\_***Time***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Where would NOW be located on this diagram?\_\_\_\_\_\_\_***Top***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. If a line stops before the top, what does this mean?

***Species has become extinct***

1. According to the diagram, humans share a most recent common ancestor with which animal?

***Whale***

1. Which is the first animal to go extinct?\_\_\_\_***Dimetrodon***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What living animals is the T-rex MOST closely related to?\_\_\_\_\_\_\_\_\_***Bird***\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_