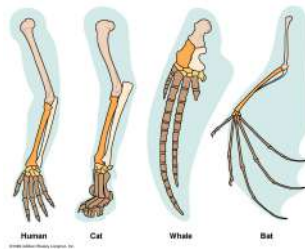


## Evolution Study Guide Answer Key

1. A group of similar organisms that can mate with each other and produce fertile offspring. Species
2. What did Darwin infer from his observations of organisms in South America and the Galápagos Islands?  
A small number of different plant and animal species had come to the Galapagos Islands from the mainland.
3. Differences between members of the same species are called Variation.
4. What are genes and how are they involved in the process of evolution? Genes control traits and only those traits can be acted on by natural selection.
5. What is the main way that a new species forms? A group is separated from the rest of the species.
6. What are fossils and what are the different kinds of fossil evidence? Fossils are the preserved remains or traces of organisms that lived in the past. (1) Mold: a type of fossil formed when a shell or other hard part of an organisms dissolves, leaving an empty space in the shape of the part; (2) Cast- type of fossil formed when a mold becomes filled in with minerals that then harden; (3) Petrified fossil – a fossil formed when minerals replace all or part of an organism.
7. What parts of organisms are most likely to become preserved as a fossil? Hard parts – shells, bones, teeth.
8. What parts of an organism can not be preserved as a fossil? Cells, tissues etc.
9. Name the two methods of dating fossils and explain each.  
(1) Relative Dating - a method to compare the ages of two fossils based on the layer of rock in which it was found.  
(2) Radioactive Dating- a technique used to determine the actual age of a fossil on the basis of the amount of a radioactive element it contains. Scientists compare the amount of the radioactive element left in the sample to the amount of the element that it breaks down into.
10. What 5 types of evidence do scientists use to prove that organisms evolved from a common ancestor?  
Fossils, Similarities in early development, similarities in body structure, DNA, and protein structure;
11. These structures below are known as homologous structures and are evidence of a common ancestor.



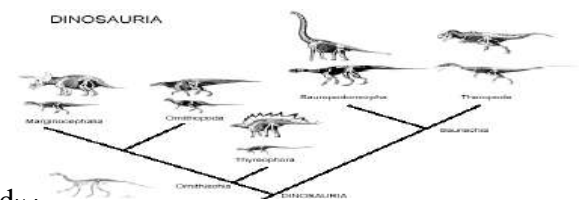
12. Name the diagram to the right and explain what it is used for.

Branching tree – used to show how scientists think different groups of organisms are related.

13. What did Darwin observe about the finches in the Galapagos Islands?

Their beaks were adaptations related to the foods the finches eat.

14. What is an adaptation? **A trait that helps an organism survive and reproduce.**



15. What is natural selection?

The process by which individuals that are better adapted to their environment are more likely to survive and reproduce.

16. Name the three causes of natural selection and explain each.

Overproduction – most species produce far more offspring than can possibly survive.

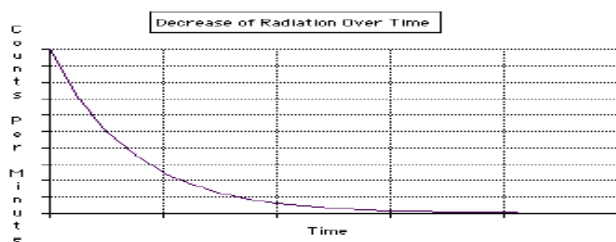
Variation – any difference between individuals of the same species.

Competition – members of the same species must compete for limited resources.

17. What evidence suggests that the ancestors of whales once walked on land? Scientists have found fossils of Whale-like creatures that had legs.

18. If the half-life of a radioactive element is 10 days, how long will it take for three fourths of a sample of the element to decay? 20 days

19. Use the graph below to answer the following questions.



- What is the half life of this element? 25 Years
- If you started with 8 grams of the element, how long would it take until there was only 1 gram left? 75 Years

20. What are mutations and how are they involved in natural selection?

Mutation – any change in a gene or chromosome that can either be helpful or harmful. They can affect the survival and reproduction of the organisms.

They are involved in natural selection as any variation within a population can be due to a mutation. This may make the organism better adapted to the environment which makes it more likely to survive and reproduce.

21. What is a scientific theory? A well- tested concept that explains a wide range of observation.

22. What is evolution? The gradual change in species over time.

23. Explain the two theories about the rate at which evolution happens.

Gradualism- the theory that evolution occurs slowly but steadily. In this theory intermediate forms between a fossilizedorganism and its descendents is needed.

Punctuated equilibrium – species evolve quickly during relatively short periods or rapid change followed by long periods of little to no change. This theory accounts to gaps in the fossil record.

24. Which theory did Darwin's ideas support? Gradualism

25. The only traits that can be acted upon by natural selection are those that are controlled by genes

26. How can species evolve different traits when they are separate from their group? Isolation

27. How did studying selective breeding help Darwin develop his theory of evolution?

Darwin observed that animals with a desired characteristic could be produced by allowing only those individuals with the characteristic to mate. He thought that a process similar to selective breeding might occur in nature.