

Topic 5.1: Evidence for Evolution Reading Guide

5.1.U1 Evolution occurs when heritable characteristics of a species change.

1. Define evolution.
2. What is the unit of evolution (what is the smallest group that can evolve)?
3. How is the scientific method evident in the development of the theory of evolution?
4. What kinds of evidence are there for evolution?

5.1.U2 The fossil record provides evidence for evolution.

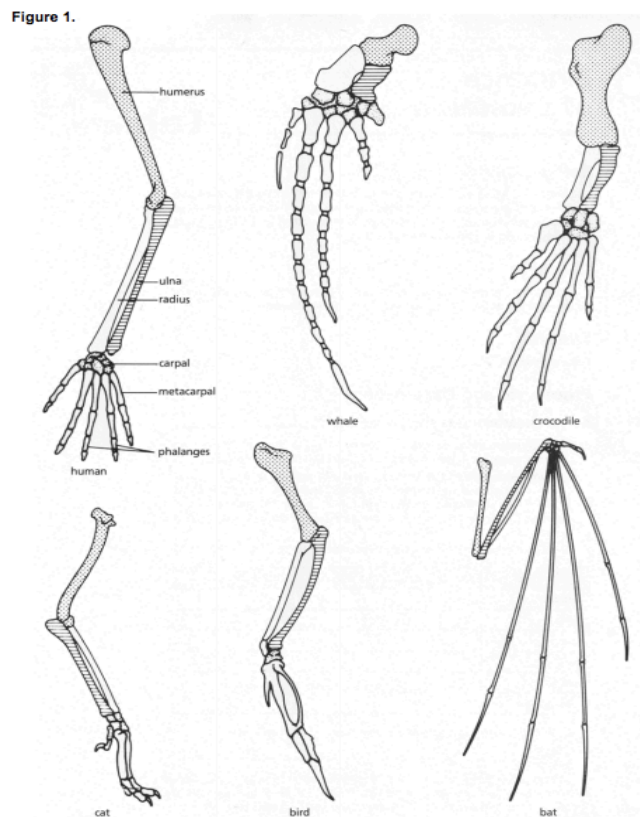
5. How do fossils help provide evidence for evolution?
6. What problems are there with the fossil record?
7. Why do some organisms found today look very similar to their fossil ancestors that are millions of years old, while other fossils have no modern day equivalent?

5.1.U3 Selective breeding of domesticated animals shows that artificial selection can cause evolution.

8. Define artificial selection.
9. How does selective breeding help us understand evolution?

5.1.U4 Evolution of homologous structures by adaptive radiation explains similarities in structure when there are differences in function.

10. What is homology
11. Define homologous structures.
12. Define analogous structures.
13. What evidence do homologous structures provide?
14. Describe how the pentadactyl limb demonstrates the process of adaptive radiation with different methods of locomotion [5.1 A.2].
15. Choose a color code for the types of bones in the pentadactyl limb in Figure one. What feature of the bones in each limb make them well adapted to their use?



5.1.U5 Populations of a species can gradually diverge into separate species by evolution.

16. Define speciation.
17. What key elements are needed for speciation to occur?
18. Describe what occurs when two populations that have been separated by speciation try to interbreed.

5.1.U6 Continuous variation across the geographical range of related populations matches the concept of gradual divergence.

19. What is continuous variation?
20. How does continuous variation help us understand that species gradually diverge from one another?
21. Develop a diagram to describe the exemplar of melanistic *Biston betularia* (peppered moth) [5.1 A.1].

