

# Chapter 4 – Review Questions

Read Chapter 4 and answer the following questions on a separate sheet of paper.

**ANSWERS MUST BE HANDWRITTEN! Typed responses will not be accepted.**

1. Describe the conditions that make life on earth just right for life as we know it.
2. Distinguish between *chemical evolution* and *biological evolution*.
3. What are *fossils*, and how do they help us formulate ideas about how life developed on earth?
4. Describe *mutations* according to the theory of evolution. What do mutations have to do with *genetic variability*?
5. Give an example of how *natural selection* works to create a change in a population according to the theory of evolution. Describe how *differential reproduction* and *adaptation* fit into the process of natural selection.
6. What is *coevolution* and why is it important?
7. Describe three common misconceptions about evolution through natural selection.
8. List two effects of the geological processes on the evolution and locations of life on earth. How could climate change and sudden catastrophes affect evolution by natural selection?
9. What is the *ecological niche* of a species, and why is it important to understand the *niches* of species? What is the difference between a species' *habitat* and its *niche*? What is the difference between a species' *fundamental niches* and its *realized niche*?
10. Distinguish between the niches of *generalist* and *specialist species*. Explain why cockroaches have been such a successful species.
11. What is *speciation*? Distinguish between *geographic isolation* and *reproductive isolation* and explain how they can lead to speciation through divergent evolution.
12. What is *extinction*? Distinguish among *background extinction*, *mass extinction*, and *mass depletion*.
13. What is an *adaptive radiation*? How can such radiation lead to recovery after a mass extinction or depletion?
14. Explain how speciation and extinction help create the planet's biodiversity. How are humans affecting extinction rates according to some scientists?
15. Describe how genetically improved crop strains are developed by *artificial selection* and by *genetic engineering*.
16. Explain why genetic engineering is an unpredictable process. Describe some of the privacy, ethical, legal, and environmental issues raised by genetic engineering.
17. What two traits have helped humans quickly become a powerful species?