

Chapter 15 – Review Questions

Read Chapter 15 and answer the following questions on a separate sheet of paper.

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

1. Discuss the benefits and risks of the possible widespread application of nanotechnology.
2. What is *geology*? What are the main characteristics of the earth's *core*, *mantle*, and *crust*?
3. Describe the *convection currents* within the earth's interior.
4. What are *tectonic plates*? What is the *lithosphere*? Describe the movement of tectonic plates.
5. What are the three different types of boundaries between the earth's lithospheric plates?
6. What are *earthquakes* and *volcanoes*, geologically speaking? Why do they tend to occur near plate boundaries?
7. Distinguish between the *external processes* of *erosion* and *weathering*. Distinguish between *physical weathering* and *chemical weathering*. Name and describe a third external process.
8. Describe *glaciers* and how they cause erosion.
9. Distinguish between a *mineral* and *mineral resource*. Distinguish among *identified resources*, *undiscovered resources*, *reserves*, and *other resources*.
10. Which five countries supply most of the world's nonrenewable mineral resources? Which three countries consume three-quarters of the most widely used metals?
11. Distinguish between a *rock* and an *ore*. Distinguish among *igneous*, *sedimentary*, and *metamorphic* rock, and give two examples of each type.
12. Describe the *rock cycle*, and explain its importance.
13. List five major environmental impacts of mining, processing, and using mineral resources.
14. Distinguish among (a) *surface mining* and *subsurface mining* and (b) *open-pit mining*, *area strip mining*, *contour strip mining*, and *mountaintop removal* as methods of extracting mineral resources.
15. What is *smelting* and what are the potential problems associated with it? What is *cyanide heap extraction*, and why is it harmful to the environment?
16. What is *economic depletion* of a mineral resource? When such depletion occurs, what five choices are available? How can the estimated depletion time for a resource be extended?
17. Explain how a competitive free market should theoretically increase supplies of a scarce mineral resource. List two reasons why this theory may not apply under today's economic conditions.
18. List the advantages and disadvantages of increasing supplies of mineral resources by (a) mining lower-grade ores, (b) mining the ocean floor, and (c) using nanotechnology to produce new minerals.
19. List two advantages and two disadvantages of using plastics to replace metals.
20. List nine ways to achieve more sustainable use of nonrenewable mineral resources.
21. What are *resource exchange webs*? List five benefits to be gained by industry from using this and other forms of *biomimicry*. Give an example of a successful program that uses biomimicry.