**APES Chapter 14: Nonrenewable Mineral Resources**

**Note Taking Focus Questions**

**Directions:** Use the Cornell Method of note taking as you answer the questions below. Your notes must be **hand written** to receive credit for them. Within your notes, use the title for each subsection of notes which is *in italics and underlined.*

**Section 14-1**

*Earth is a Dynamic Planet*

1. List and describe the 3 concentric zones of the Earth.

2. Where are most of the mineral resources that we are dependent upon found?

*Minerals and Rocks*

1. Define the term mineral.

2. What is a mineral resource? Why are they important? Are they renewable?

3. Define the term rock.

*Type of Rocks Based Upon How They Formed*

1. List the 3 types of rocks, how they are formed, and a few examples of each rock type.

*Using Our Mineral Resources*

1. How many different minerals do we use?

2. What is ore, and what is the difference between a high grade ore and a low grade ore?

3. List some of the things that you use that are produced from minerals.

**Section 14-2**

*How long will minerals last?*

1. What is meant by a mineral reserve?

2. How can reserves be expanded?

3. What does is mean for a resource to be economically depleted?

4. What are the 5 choices once a resource is economically depleted?

5. What is meant by depletion time?

6. How are each of the 3 depletion time estimates calculated?

7. List some minerals that there are abundant deposits of and some that are scarce.

*Mineral Supplies*

1. What 5 nations supply most of the nonrenewable mineral resources?

2. Why is there concern about the U.S. supplies of 4 strategic metals? What are the 4 metals?

*Rare Earth Elements*

Read the Core Case Study on p. 350 to answer the following questions:

1. What are rare earth elements – how many are there?

2. What property of the rare earth elements makes them useful for technology?

3. List some items that these elements are used to make.

4. Why do industrialized nations need affordable supplies of these elements?

Return to the section titled “Global and U.S. Rare Earth Supplies”

5. What country produces 97% of the world’s rare-earth metals?

6. Why does the country above have such a high % of the supply and why was the last U.S. rare earth mine closed?

*Market Prices Affect Supplies*

1. How does economics play a role in the supply of mineral resources?

2. How should resource pricing work in a competitive market?

3. Why does a truly competitive free market not really exist in MDCs?

*Extracting Minerals from the Ocean*

1. What 3 minerals are currently extracted from sea water?

2. What 2 places can mineral deposits potentially be found in the ocean and why aren’t they being harvested?

3. Who is responsible for issuing seafloor mining permits in international waters?

4. What are the environmental advantages and disadvantages of mining in the ocean?

**Section 14-3**

*Mineral Use Creates Environmental Impacts*

1. What is included in the life cycle of a metal product?

2. How is the environmental impact of mining related to the grade of the ore? Give specifics.

*Types of Mining*

1. Define and describe the following: surface mining, overburden, spoils, open-pit mining, strip mining, area strip mining, contour strip mining, and mountaintop removal.

*Environmental Impact of Removing Metals from Ore*

1. Read the Case Study “The Real Cost of Gold”. Describe the techniques by which gold is extracted from ore and the environmental impacts of that extraction. How do mining companies avoid the responsibility of cleaning up their mining operations?

2. What are tailings? How can they can impact the environment?

3. What is smelting? How does it impact the environment?

**Section 14-4**

*Using Mineral Resources More Sustainably*

1. How does the current materials revolution demonstrate our ability to find substitutes?

2. What can be does to increase supplies of rare-earth metals?

3. List the additional ideas from figure 14-17 on p. 364.

**Section 14-5**

*Earth’s Major Geological Hazards*

1. What are tectonic plates, and how do they impact geological activity?

2. *Volcanoes:* How do they form? How are they harmful? How can they be beneficial? What can be used to predict them?

3. *Earthquakes:* How do they happen? What are seismic waves? How are they measured? What impacts do they have? How can damage be minimized?

4. *Tsunami:* What is it and what can cause it? Why do they become more of a problem near shore? How are some areas of the world trying to detect them?