

Chapter 14 Notes – Nonrenewable Mineral Resources

Core Case Study: The Crucial Importance of Rare Earth Metals

- What are the rare-earth metals used to make (list 5)
- What are they used for in hybrid and electric cars?
- Are they “rare”, why are they called “rare earth metals”?

14-1 What are the Earth's Major Geological...

- Why are mineral resources nonrenewable?
- List and describe the three concentric layers of the Earth.
- Describe the asthenosphere and lithosphere and where are they located.
- Define mineral, mineral resource and rock. Are most minerals elemental or inorganic compounds?
- How are rocks defined? Name and describe the three types of rocks.
- Define ore. What is the difference between high-grade and low- grade ore?
- List examples of metallic mineral resources.
- List examples of nonmetallic mineral resources:
- What are reserves and how do they change? How can the reserve change even if the absolute quantity of the mineral does not?
- What is depletion time? When a resource becomes economically depleted, what are five things we can do?
- Why do estimates of depletion time vary?
- What are strategic metal resources? Name the four for the U.S.
- Who produces 97% of the world's rare-earth metals and oxides? Why?
- How much does the U.S. currently produce? Where is the largest U.S. rare-earth metal mine?
- Why do some economists think the free market price effect doesn't apply to mineral resources?
- What are three factors that limit the mining of lower- grade ores?
- What is biomining? What is it economically feasible for, and why?
- What factors influence mining in marine environments?

14-3 What are the Environmental Effect From Using Nonrenewable

Minerals?--- What are four negative effects of extracting minerals from the earth's crust?

- What is a product's life cycle?
- List and describe five types of mining (4 surface, 1 deep)
- Roughly how many surface mines are located in the U.S.? What environmental problems are associated with them?
- What environmental benefits to deep mines have? What problems are associated with deep mines?
- How do mining companies often avoid cleaning up mining operations?
- What percent of gold mines use cyanide to extract it? Is this necessary?
- What are Tailings?

- Describe smelting:
- What kinds of pollution can smelting cause?
- What are two of the most toxic industries?

14-4 How Can We Use Mineral Resources...

- What materials could replace some metals for common uses?
- What are some new technologies that require metals?
- Why is recycling aluminum more sustainable than mining aluminum ore?
- What are four sustainable uses of nonrenewable minerals?

14-5 What are the Earth's Major Geologic Hazards?

- Roughly, how many major tectonic plates are there? What do they "float" on, and how fast do they move?
- What are some environmental impacts of volcanoes? (positive and negative)
- What tectonic plates come together in California?
- Define the following related to earthquakes... focus, epicenter, magnitude, amplitude.
- Describe the Richter scale.
- Where was the largest recorded earthquake, how big was it?
- How do tsunamis form?
- Where did the December 2004 tsunami occur and was at what magnitude?
- What kinds of damage occurred during the 2011 Japan tsunami?