

APES OBJECTIVES

FriRel: CHAPTER 8 Objectives - EARTH SYSTEMS & RESOURCES

KEY OBJECTIVES: This chapter is all about earth science. The students will learn about the rock cycle, plate tectonics and the properties of soil.

24. Mineral Resources & Geology

- Describe the formation of earth & the distribution of critical elements on Earth.
- EARTH'S LAYERS Briefly describe the layers of the earth's interior. Describe the internal and external earth processes responsible for forming earth's landscape.
- EARTH'S LAYERS Distinguish between internal and external geologic processes. Discuss how these processes affect human activities and natural ecosystems.
- Define the theory of plate tectonics & discuss its relevance to the study of the environment.
- EARTHQUAKES Describe how earthquakes are caused. Be sure to distinguish three different tectonic plate boundaries and the geologic features often found at each. Describe how tsunamis are formed.
- ROCK CYCLE List and define three broad classes of rock. Briefly describe the rock cycle and indicate interrelationships among these classes. Discuss its importance in environmental science. Describe the role of volcanoes in the rock recycling process.
- MINING Distinguish between subsurface and surface mining. Briefly describe the environmental impacts of mining.
- RESOURCE DEPLETION CURVE Draw a hypothetical depletion curve. Project how this curve would be affected by the following changes in assumptions: (a) recycling of the resource is increased, (b) discoveries of new deposits of the resource are made, (c) prices rise sharply, (d) a substitute for the resource is found.
- TYPES of MINERAL RESOURCES List three types of mineral resources, and give one example of each. Clarify the relationship between identified resources and reserves.
- COST of RESOURCE USE Describe the economics of nonrenewable minerals. Explain the limitations of mining lower-grade ores. Discuss the option of getting more minerals from the ocean.
- SUSTAINABLE RESOURCE USE Describe how mineral resources can be used more sustainably.

25. Weathering & Soil Science

- **Soil** Explain how soil forms & describe soil characteristics.
 - Identify major soil characteristics including texture and components.
 - Diagram a soil profile (horizons) and describe a healthy soil ecosystem.
 - Identify and describe soil tests that would assist in maintaining soil fertility and facilitate agriculture.
- Understand how weathering & erosion occur. Distinguish between weathering & erosion.
- Understand how weathering & erosion contribute to element cycling & soil formation.
- Differentiate between the soil problems of erosion, salinization, waterlogging, and nutrient depletion.

- Describe how humans extract elements & minerals (mining).
- Describe the social & environmental consequences of these activities.

VOCABULARY TERMS

- Core
- Richter scale
- E horizon

- Mantle
- Rock cycle
- B horizon

- Magma
- Minerals
- C horizon
- Asthenosphere
- Igneous rocks
- Texture
- Lithosphere
- Intrusive
- Cation exchange capacity
- Crust
- Extrusive
- Soil bases
- Hot spots
- Fractures
- Soil acids
- Plate tectonics
- Sedimentary rocks
- Base saturation
- Tectonic cycle
- Metamorphic rocks
- Soil degradation
- Subduction
- Physical weathering
- Crustal abundance
- Volcano
- Chemical weathering
- Ores

- Divergent plate boundaries
- Seafloor spreading
- Convergent plate boundaries
- Transform fault boundary
- Fault
- Fault zones
- Earthquakes
- Seismic activity
- Epicenter
- Acid rain
- Erosion
- Deposition
- Soil
- Parent material
- Horizons
- O horizon
- A horizon
- Topsoil
- Metals
- Reserve
- Strip mining
- Mining spoils (tailings)
- Open-pit mining
- Mountaintop removal
- Placer mining
- Subsurface mining