

APES- Chapter #23 Guided Reading
Botkin & Keller- *Materials Management*

Name: _____

Chapter Objectives:

- *The importance of resources to society*
- *The differences between mineral resources and reserves*
- *The factors that control the environmental impact of mineral exploitation*
- *How wastes generated from the use of mineral resources affect the environment*
- *The social impacts of mineral exploitation*
- *How sustainability may be linked to the way we use nonrenewable resources*
- *The emerging concepts of materials management and how to achieve it*
- *The advantages and disadvantages of each of the major methods that constitute integrated waste management*
- *The various methods of managing hazardous chemical waste*
- *The problems related to ocean dumping and why they will likely persist for some time*

Pg. 520: Treasures of the Cell Phone

1: *What are the reasons why e-waste is not recycled more?*

23.1: The Importance of Resources to Society

1: *Define the following:*

* **Renewable Resources**

* **Non-Renewable Resources**

What **differentiates** renewable and non-renewable resources?

2: How many tons of non-fuel minerals does the typical American use per year?

23.2: Materials Management: What is it?

1: Define **Materials Management**:

2: What are 5 *ways* that this can be pursued?

3: How does the idea of materials management and recycling changing where paper mills are located?

23.3: Mineral Resources

- 1: When **metals are concentrated** in such high amounts by geologic processes, _____ are formed.
- 2: In the **Earth's crust**, which element makes up the most % by composition? What is 2nd?
- 3: How are *sedimentary processes and weathering* involved in mineral deposits?

23.4: Figuring Out How Much is Left

- 1: What is the difference between a **mineral resource** and a **mineral reserve**?
- 2: Earth's mineral resources can be divided into which broad categories?
- 3: When the availability of a particular mineral becomes limited, there are four possible solutions:
 - 1:
 - 2:
 - 3:
 - 4:

23.5: Impact of Mineral Development

- 1: What are some of the **environmental impacts** of surface mining (open-pit mines)?
- 2: What are some of the **social impacts** of large scale mining operations?
- 3: What can be done to *minimize* the environmental effects of mining?
- 4: What are the 3 R's of waste management?

23.6: Materials Management and Our Waste

- 1: Compare "*dilute and disperse*" to the contemporary method of "*concentrate and contain*".
- 2: In the next few years, how many U.S. cities will run out of landfill space?
- 3: What is "**NIMBY**"?
- 4: Describe the concept of "*industrial ecology*" and how it will be *essential in the future*.
- 5: What is your opinion of "*pay as you throw*"? **Defend your opinion**

23.7: Integrated Waste Management

1: Define **Integrated Waste Management (IWM)**:

2: What is *waste stream*?

3: What is *single-stream recycling*?

4: What are some creative ways that industry are encouraging recycling?

5: How can **human waste (night soil)** be re-used and recycled? What are some drawbacks?

23.8: Municipal Solid-Waste Management

1: *Which product* comprises the largest percentage of waste dumped in the United States? *Is this surprising?*

2: Define **Composting**: (*What are the pros and cons?*)

3: What are the *pros and cons* of **incineration**?

4: What is a **sanitary landfill** and *how is it accomplished*? How is a **sanitary landfill** selected? *What things need to be considered?*

5: What is environmental justice?

6: What is *leachate*?

7: How can pollutants enter the environment from sanitary landfills?

8: What are the *federal mandates* for sanitary landfills?

9: What are some actions you can take to reduce the waste you generate?

23.9: Hazardous Waste

1: Where is most of the hazardous waste generated in the U.S.? *What are the sources* of hazardous waste in the United States?

2: Summarize (in 3-4 sentences) the story of **Love Canal**.

23.2: A Closer Look: “e-waste: A Growing Environmental Problem”

1: Summarize the problem with e-waste in the United States.

23.10: Hazardous-Waste Legislation

1: What is the purpose of RCRA (Resource Conservation and Recovery Act)?

2: What is the purpose of CERCLA (Comprehensive Environmental Response, Compensation and Liability Act)?

23.11: Hazardous-Waste Management: Land Disposal

1: Look at the chart on pg. 541- List the PROS/CONS of each of the Hazard Reduction Technologies

23.13: Ocean Dumping

1: What are some of the ways that ocean pollution has affected ocean life?

2: Why are the marine waters of Europe in trouble?

3: Why is the microlayer of the ocean considered to be so important?

23.14: Pollution Prevention

1: What are the steps of ocean pollution prevention?

23.15: Sustainable Resource Management

1: What is the R to C Ratio- What does it tell us?

Read: *Can We Make Recycling a Financially Viable Industry?*

Answer the following:

1: *What can be done about the global problem of e-waste? Could more be recycled safely?*

2: *What can be done to assist recycling industries to become more cost-effective?*

3: *What are some of the indirect benefits to society and the environment from recycling?*

4: *Define or criticize the contention that if we really want to do something to improve the environment through reduction of waste, we have to move beyond evaluating benefits of recycling based simply on the fact that it may cost more than dumping waste in a landfill.*

5: *What are the recycling efforts in your community and university, and how could improvements be made?*

Summary: *Suppose you found that the home you had been living in for 15 years was located over a buried waste disposal site. What would you do? What kinds of studies could be done to evaluate the potential problems?*

