Name: _____

Block: _____

Minerals and Mining (Chapter Reading Packet)

1. Summarize the central case study: Mining for…..Cell Phones?

2. Explain how we process metals after mining ore.

3. Describe the environmental impacts of processing minerals.

4. Complete the following table to contrast different types of mining.

MINING TYPE	DESCRIPTION	MINERALS COMMONLY MINED USING THIS METHOD	ENVIRONMENTAL/HUMAN HEALTH IMPACTS
Strip Mining			
Subsurface Mining			
Open Pit Mining			
Pacer Mining			

Mountaintop Mining			
Solution Mining			
Ocean Mining			

5. Read the Science Behind the Story on Pages 652-653. Answer the following:
   - Describe THREE environmental impacts of mountaintop mining.

   - Can mined mountaintops, filled valleys, and human health be restored to their original condition after mining? The science so far says no. Identify TWO ways reclamation practices have failed.

6. Explain why restoration of mined sites is often only partly effective (Pages 654 and 656).

7. Describe the following legislation related to mining.
   - 1977 Surface Mining Control and Reclamation Act (Page 654)

   - General Mining Act of 1872 (Page 657)

8. Summarize the factors that affect how long mineral deposits may last. Explain how each might increase or decrease the time span the mineral will be available to us.
   - Discovery of new reserves –

   - New extraction technologies –

   - Changing social and technological dynamics –

   - Changing consumption patterns –

   - Recycling -

9. Name three types of metal that we currently recycle and identify the products or materials that are recycled to recover these metals.

   - Metal #1: _____ Product: _____
   - Metal #2: _____ Product: _____
   - Metal #3: _____ Product: _____

10. You have won a grant from the EPA to work with a mining company to develop a more effective way of restoring a mine site that is about to be abandoned. Describe a few preliminary ideas for carrying out restoration better than is typically being done.

11. Describe a field experiment you would like to run to test one of your ideas from #10. Think about the following when designing your experiment. (HINT: These are the items AP expects you include about designing experiments, should you happen to have an experimental design FRQ on the AP Exam.)

- Hypothesis – Remember that an acceptable hypothesis lists two variables (e.g. "an increase/decrease in Variable A causes an increase/decrease in Variable B). Vague hypotheses such as "Variable A affects Variable B" or "Variable A kills Variable B" are not acceptable.

- Explain the control vs. experimental groups. Discuss variables – what are you changing, what are you keeping constant?

- Identify the Independent Variable: _____ (remember that this is the variable the researcher is manipulating or changing)

- Identify the Dependent Variable: _____ (remember that this is what you are measuring)

- Describe your data collection procedures. Be very specific when describing data collection. What are you measuring? How long will you collect data? Include a specific area or sample size in your description.

- Describe how you will analyze your data. Describe a graph you will create to analyze your data. If given an experimental design FRQ on the AP test, the following quote will almost always earn you a point – "I will analyze my data using statistics to determine if the experimental group results are statistically significant (or different from the control group results)."

- Provide one other elaboration point on your experimental design. You could mention that you will have your experimental results peer reviewed and submit them for publication in a scientific magazine. You could provide an idea for an extension to further your studies. (If given as a FRQ experimental design question, AP will be looking for elaboration on some part of your study in order to earn an additional point).