

Title of Lab: Cookie Coal Mining

Purpose(s) of Lab: Coal forms from the remains of plants that died and were buried millions of years ago. Soils such as sand and silt build up adding pressure and heat which also contribute to the formation of coal. Coal is harvested through the process of mining for its energy. This lab will investigate the affects that mining has on soil.

Materials:

- 4 chocolate chip cookies from 2 *different* brands
 - Cookie is soil
 - Chips are coal
- 2 round toothpicks
 - These are your mining tools
- Paper plate or napkin
- Glass of milk
 - You can't have cookies without milk ☺
- Timer
 - A clock with a second hand works just fine

Procedure:

Part I

1. Use 1 cookie from each brand for this part of the experiment. Each cookie represents a different land site containing coal, draw a topographical map of each cookie (Cookie A & Cookie B) and map the location of any chips (coal) you can see from the top.
2. Count and record the number of chips that are visible from the top and sides of each cookie and record in your data table.
3. Use your toothpicks to mine as many pieces of coal from each cookie and collect in separate piles. When you have finished, record the numbers in the data table.
4. Attempt to “reassemble” each cookie without the chocolate chips. When you have finished, compare each land site with the original map you drew.

Part II

1. Again, use 1 cookie from each brand for this part of the experiment. Each cookie represents a different land site containing coal.
2. Count and record the number of chips that are visible from the top and sides of each cookie and record in your data table.
3. Dip 1 of the cookies into the milk for 20 seconds.
4. Remove and place on the paper plate.
5. Mine for coal. Record the number of chips recovered in the data table.
6. Repeat for the other brand of cookie.

Data:

Part I

Cookie (brand)	# of chips on surface	# of chips mined
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A		
B		

Part II

Cookie (brand)	# of chips on surface	# of chips mined
A		
B		

Conclusion:

1. Explain the biological processes that take place to form coal.
2. List 2 ways we use coal.
3. Explain why coal is a nonrenewable resource.

Questions:

Part I

1. Which cookie (A or B) had more chocolate chips?
2. Which cookie was easier to mine?
3. How does this activity compare with real coal resources?
4. Was it easier to mine chips from the surface? Explain how this compares to surface and underground mining.
5. After attempting to reassemble your cookie upon removal of the chips, what difficulties did you experience?
6. How does this compare to what happens after coal mines are abandoned?

PART II

1. How did mining for chips in part II compare to part I?
2. Explain why it was easier or harder in part II.
3. What natural process does the milk represent that would cause the soil to erode?

Once you have completed the lab, you may consume your milk and cookies! Enjoy! ☺