

PRIMARY/ELEMENTARY Activity: Chocolate Chip Cookie Mining

Concepts

- Coal is an energy resource that is mined from the earth.
- Coal is a nonrenewable resource.
- Some places have more coal than others.
- Some places have coal that is easier to mine than others.
- Coal on the surface is easier to mine than coal that is underground.



Time

One 45-minute class period

Materials Needed Per Student

- 2 different kinds of chocolate chip cookies
- 2 toothpicks
- 2 napkins
- 1 piece of paper



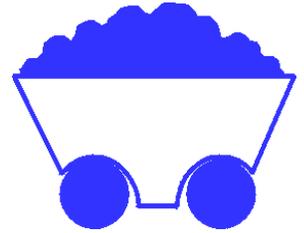
Procedure

1. Explain that coal was formed from plants that lived millions of years ago. When the plants died, they were buried under sand and silt. Over time, the sand and silt built up, putting heat and pressure on the thick layer of dead plants, and changing it into coal.
2. Ask the students how we use coal. Discuss the ways in which we use coal every day. Remind the students that coal is a nonrenewable energy source. Once we use it, we cannot make more of it in a short period of time.
3. Explain that coal is buried underground and it is harvested through the process of mining. When coal is mined, the land that the coal came from must be reclaimed so that people can use the land again.
4. Explain to the students that they will be comparing two different land sites containing coal. They will mine the coal from each piece of land.
5. Show the students their "land" (cookies) and "mining equipment" (toothpicks). Emphasize that the cookies are not to be eaten during the mining, but may be at the end. Make sure all students know which cookie is A and which is B.
6. Explain the mining process to the students, using the directions on the worksheet.
7. Make a chart on the board with class totals from cookies A and B. Compare the results.
8. Eat the cookies!
9. Ask the students which type of cookie was easier to mine and which type of cookie contained the most coal (chips). Discuss with the students how this compares with coal resources. Do some areas have coal that is easier to mine than others? Do some areas have more coal than others?
10. Ask if it was easier to mine chips on the surface of the cookie or chips inside the cookie. Discuss with the students the differences between surface and underground mining.
11. Ask the students if their reclaimed cookies looked like the original cookies. Discuss land reclamation and why it is important.

Additional information on coal formation, uses and mining can be found in the Primary Energy Flipbook and Elementary Energy Infobook, available at www.need.org.



Student Worksheet Chocolate Chip Cookie Mining



Name: _____

1. Trace the outline of cookie A on a piece of paper. Map the location of the chocolate chips you can see on the top.
2. Count the number of chips you can see on the top and sides of the cookie. Record this number on the chart.
3. Using the toothpick, carefully mine as many chocolate chips as you can from the cookie. Set the chips aside in a pile.
4. Count the number of chips mined from the cookie. Record the number on the chart.
5. Put the cookie back together without the chocolate chips. Compare to your map of the cookie.
6. Repeat the procedure for the other cookie.

My Totals

Class Totals

Cookie	# of surface chips	# of chips mined	Cookie	# of surface chips	# of chips mined
A			A		
B			B		

Which cookie was easier to mine and why?

What is reclamation and why is it important?

List two ways we use coal today.

