

Chocolate Chip Cookie Mining

Background Information

RENEWABLE ENERGY SOURCES:

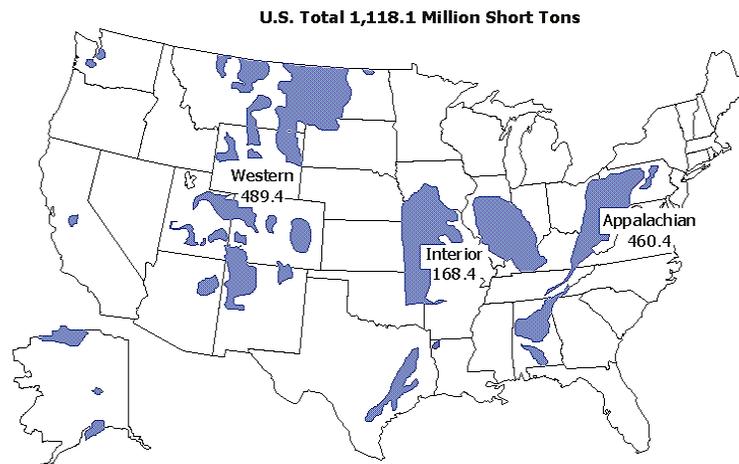
Renewable energy sources are energy sources based on natural cycles that can be replenished during a person's lifetime as a time reference. These resources can be managed to provide long-term power needs and will not run out. Trees and crops can be replanted. The sun shines each day. Rivers flow to the sea and winds can be expected to continue to blow. Examples of renewable energy systems include geothermal energy, solar energy, biomass energy, wind energy and hydropower.

NONRENEWABLE ENERGY SOURCES:

Non renewable energy sources are based on limited reserves created several million years ago by unique geological and physical conditions. Such reserves will eventually run out as the available deposits are depleted. The most common of these types of fuels are often referred to as fossil fuels and include petroleum, coal, and natural gas.

United States Coal Deposits

DOE



Coal is compressed remains of ancient plants. For millions of years, buried plants were heated and compressed. In the past coal has been used to power steamships and railroad engines, to heat homes and provide heat for steel production. Today the primary use for coal is in the generation of electrical power.

Coal generates more environmental impacts than any other energy source. Coal mining disturbs large areas of land creating surface water quality problems and ecosystem impacts. Burning coal produces large amounts of air pollutants that have been linked to mercury pollution, smog, global warming and other environmental problems.

Activity

Students will be using a chocolate chip cookie to demonstrate the process of mining. Students should keep in mind the benefits associated with mining and the importance of land reclamation.

Materials

Paper plate, chocolate chip cookie, toothpick, spoon, small cup and worksheet

NOTE: Oatmeal raisin cookies can also be used.

Procedure

- Students should work with a partner.
- Gather materials.
- All mining must be done on the paper plate. This is to contain the "mining wastes."
- Remove all chocolate chips from the cookie and place them in the cup. Only mining "tools" may be used. Do not use your hands or fingers.
- After the mining process is completed, use the work sheet to calculate mining income and costs.
- When completed, students may clean up their mining area and ore deposits by eating them.

Assessment: Worksheet

Names _____

Chocolate Chip Cookie Mining

1. Define RENEWABLE resource and give an example.

2. Define NONRENEWABLE resource and give an example.

Income		Cost	
Number of Chips mined	Money earned Number of chips times \$200	Number of crumbs on plate	Cost to repair land Number of crumbs times \$100

Money earned from mining chips	MINUS	Money spent on fixing land damaged in mining	EQUALS	Total Money Earned Mining
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3. Were you able to remove all the chips from the cookie?
4. If no, why not?
5. Could you make your post-mining cookie look like it did before mining took place?

6. Compare this activity with the real impact when mining coal. What happens to plants and animals?

7. In real mining, why is some deposits of coal more expensive to mine than others?

8. Name several states that have coal deposits.