How much energy are you wearing?

Educational Farm & Nature Preserve

Objective: To understand that Earth's resources can be used for energy. One way we use energy is to produce clothes. Discuss renewable and non renewable resources.

ODE Common Core Model Tie-In

Grade 3 Earth & Space Science

Topic: Earth's Resources

Concepts: Earth's resources can be used for energy. Some of earth's resources are limited.

Background: Earth's resources can be used for the energy they contain. Our clothing comes from **plants** (cotton, rayon), **animals** (leather, wool, down, silk) and **petroleum** (polyesters, acrylics).

This activity is designed to get students thinking about all the energy that goes into producing clothing. Energy is used to plow the fields, plant the seeds, and fertilize and spray pesticides on the plants. Energy is used to cut the trees and treat with chemicals to make rayon. It is also used to grow food to feed the animals that will be used to make shoes, gloves, handbags, and belts from leather. Energy is used to pump the oil from the ground and turn it into synthetic fibers. Energy is also used to transport materials and the clothing to stores.

Some natural resources we use are renewable (plants, animals, air, water). Others are non-renewable (oil, coal, natural gas, minerals). All natural resources should be conserved.

Materials:

- Encyclopedias, internet, nonfiction books on topic of energy and resources
- Poster or presentation supplies
- "Energy Used" note organizer for each student or small group

Helpful Vocabulary:

- **Energy:** source of power, ability to work
- **Nonrenewable resource:** a resource that is a finite energy source (can be used up)
- **Renewable resource:** a resource that is replenished by natural processes within a short amount of time.

Procedure:

- Ask the class how many of them are wearing plants today. After hearing their responses, discuss what type of clothing is from plants (cotton, rayon). Then ask how many are wearing cows (leather). How many are wearing sheep (wool)? How many are wearing oil

(polyesters and acrylics)? Students can look at labels in their clothing to see what they're made of.

- Discuss where cotton, wool, acrylic, polyester, leather, silk and rayon come from.
- Choose one item of clothing as an example. Use a chart as on the "Energy Used" organizer to brainstorm the steps and energy used to create the clothing.
- Discuss nonrenewable and renewable resources. Make a note as to the types of resources in the "energy used" column of chart.
- *Example:*

Step	**Energy Used**
• Grow cotton plant • Harvest cotton • Clean, spin and weave into cloth • Assemble into shirt and put into packaging • Truck it to a warehouse • Truck it to a store • Take it home in a car	• Air, water (*renewable*) • Gas for tractor (*nonrenewable*) • Gas for harvesting machine or truck to carry farm workers (*nonrenewable*) • Electricity for processing machines (*nonrenewable* if from coal) • Electricity for assembly machines • Gas for truck or coal for train (*nonrenewable*) • Gas for car (*nonrenewable*)

- Ask "What do you notice about making clothes? Are you surprised at all the work and energy that goes into making them? In this example, are more renewable or nonrenewable resources used? Allow students to share their thoughts.
- Divide into small groups. Have each group choose one fabric. They will research how this fabric is made, take notes using their "Energy Used" organizer, and present their findings to the class. Presentations could consist of a poster, skit, song, powerpoint, etc.

Follow up/extension:

Compare and contrast the fabrics presented and their processing. Do some types of clothing use more energy than others?

Discuss how much energy might be saved by buying used clothing or swapping with friends. How many stages would be eliminated and what other savings would there be besides energy (money).

Discuss what happens to clothes that are thrown away (dump/landfill).

Students might organize a clothing sale/swap at school. PTA could assist, and students could present their findings on energy to the school community.

Fabric: _____

Steps	**Energy used**