

Energy Conservation

Strand	Earth Resources
Topic	Renewable and Nonrenewable resources
Primary SOL	3.11 The student will investigate and understand different sources of energy. Key concepts include b) sources of renewable energy; and c) sources of nonrenewable energy.
Related SOL	3.1 The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which m) current applications are used to reinforce science concepts.

Background Information

After studying renewable and nonrenewable energy sources, students should realize that there is not a perfect solution to energy production. One good way students can help protect earth resources is through energy conservation.

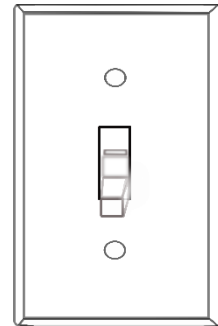
Materials

- Poster Paper

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Introduction

1. Ask students where electricity comes from and how it is generated.
Electricity travels to schools and homes through power lines, from power plants where it is generated through mechanical or chemical processes.
2. Ask students to name resources that are used to produce electricity.
Fossil fuel oil, Coal, Natural Gas, Nuclear Fission (Uranium), Wind, Biomass, Geothermal, Solar Power, Hydropower
3. Review the advantages and disadvantages of each resource. Reference the Renewable and Nonrenewable Energy Sources Factsheet as necessary.



Procedure

1. Discuss the risk in using up nonrenewable energy sources, and explain to students that they can protect these nonrenewable energy sources by conserving energy use. Ask students to brainstorm ways they can be energy smart by conserving energy and using it responsibly.
2. Using the Today's Energy Use table, have each student create a list of every energy source they used in the past day. See who has the most energy sources.



3. Have students cross out every activity that requires coal, oil, or natural gas. Explain that in the future, students will likely have to limit their use of these nonrenewable resources. Have students rethink their activities for the day and come up with alternative activities or alternative fuel sources to replace the activities which rely on these three resources.
4. List the five ways to conserve energy:
Be Energy Smart:
 1. Turn off lights, televisions, and computers when you leave the room.
 2. Change light bulbs. Fluorescent and LED bulbs use less energy than incandescent.
 3. Do not leave the fridge door open for long.
 4. Keep the house doors shut when the air conditioning or heating is on.
 5. Take short showers and do not let the water run when you are brushing your teeth or washing your hands.
5. Have students complete the Energy Saver Matching Game.
6. Have student create posters which explain energy conservation. Give students creative freedom in selecting an appropriate method to depict the conservation methods: cartoons, lists, or other creative methods. However, whatever the format, posters should pinpoint specific ways students can work on energy conservation in their own homes. Have students take posters home to share with their families.

Conclusion

1. Send students home with the Letter for Parents/Guardians which explains what they are studying. Have students work with their parents/guardians to identify ways they can conserve energy in their homes.

Assessment

- Have student work in teams to create videos which explain energy conservation. Give students creative freedom in selecting an appropriate method to depict the conservation methods, constructing mock interviews, dramatizations, or documentaries. However, whatever the format, videos should cover all five Energy Smart habits. Consider assigning certain teams to deal with school energy conservation and others to discuss home energy conservation.
- **Other**
 - Have students complete the Classifying Energy Sources activity sheet.

Extensions and Connections (for all students)

- Have students create graphs to chart the levels of energy used by CFLs, incandescent, fluorescent, and LED light bulbs. Contact a local power supplier to obtain this information.
- Have students create posters using the “Wanted: Energy Waster” template. Award students with their Energy Agent badges, and appoint them as secret agents to protect the use of energy in their school. Encourage them to check bathrooms for running water, to turn off lights in empty rooms, and to make sure all unused appliances are

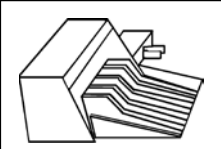

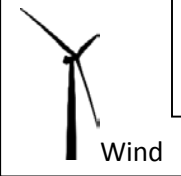
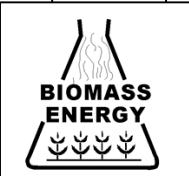
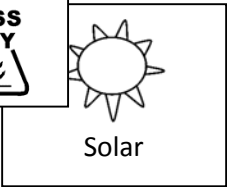
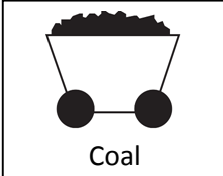
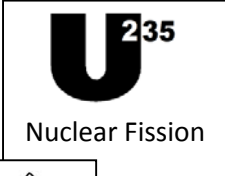
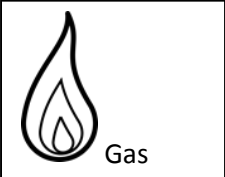
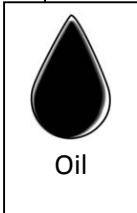


turned off to conserve electricity.

Strategies for Differentiation

- The variety of activities in this lesson provides opportunities for visual, auditory, verbal, and kinesthetic learners.

Answers key: Classifying Energy Sources

Renewable Energy Sources	Nonrenewable Energy Sources
 <p>Hydropower</p>  <p>Geothermal</p>  <p>Wind</p>  <p>BIOMASS ENERGY</p>  <p>Solar</p>	 <p>Coal</p>  <p>U²³⁵ Nuclear Fission</p>  <p>Gas</p>  <p>Oil</p>



Today's Energy Use

Draw a picture of every way you have used electricity today. Label each picture.



Energy Saver Matching Game

1. Cut out squares along dotted lines.
2. Fold each strip in half with the blank sides facing each other. Glue.
3. Spread cards on a flat surface with the “Saver” and “Waster” sides down.
4. Try to identify one “Saver” card and one “waster” card using the clues on the front.
5. If you guess two card correctly, place them in a pile and let the other player take a turn.
6. Repeat this until all cards have been matched.
7. The player with the most cards wins.

Turn off radios and TVs when you are not using them.	Saver
Use a solar-powered calculator.	Saver
Use a broom instead of a vacuum cleaner.	Saver
Wear a sweater instead of turning the heater up.	Saver



Cook multiple dishes in the oven at the same time.	Saver
Put a lid on your pan when cooking.	Saver
Ride the bus instead of driving to school.	Saver
Dry your laundry on a clothes line instead of in the dryer.	Saver
Recycle metal, plastic, and glass containers.	Saver



Give your used clothes to a brother or sister or a friend instead of throwing them away.	Saver
Check the bathrooms at home and school to make sure the faucets or all the way off.	Saver
Combine errands so you only have to take one car trip.	Saver
Wash and rinse dishes in a pan of water instead of letting the faucet run.	Saver
Take showers instead of baths.	Saver



Use electric lighting even when the sun is shining.	Waster
Drive to school instead of taking the bus.	Waster
Allow leaky faucets and toilets to run instead of fixing them.	Waster
Let the heater or air conditioner run when you are not home.	Waster
Open oven door and peek to see if food is done instead of using a timer.	Waster



Use an electric toothbrush, not a hand-operated one.	Waster
Leave the water running while you brush your teeth.	Waster
Leave the fridge door open while you make your meal.	Waster
Use incandescent light bulbs instead of fluorescent.	Waster
Use a large burner to heat a small pan.	Waster



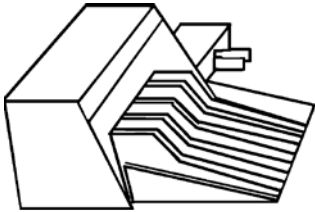







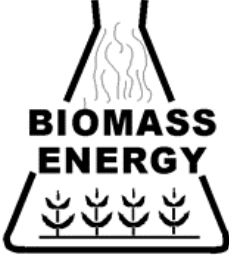
Run the washing machine when you do not have a full load of laundry.	Waster
Leave doors standing open when it is hot or cold outside.	Waster
Always use hot water to wash clothes.	Waster
Leave the computer on when you are done using it.	Waster



Classifying Energy Sources

Directions: Cut out the pictures and glue each energy source to the correct side of the chart.

Renewable Energy Sources	Nonrenewable Energy Sources

 <p>Hydropower</p>	 <p>Coal</p>	 <p>Nuclear Fission</p>	 <p>Geothermal</p>	
 <p>Oil</p>	 <p>Solar Power</p>	 <p>Wind Power</p>	 <p>Natural Gas</p>	 <p>BIOMASS ENERGY Biomass</p>

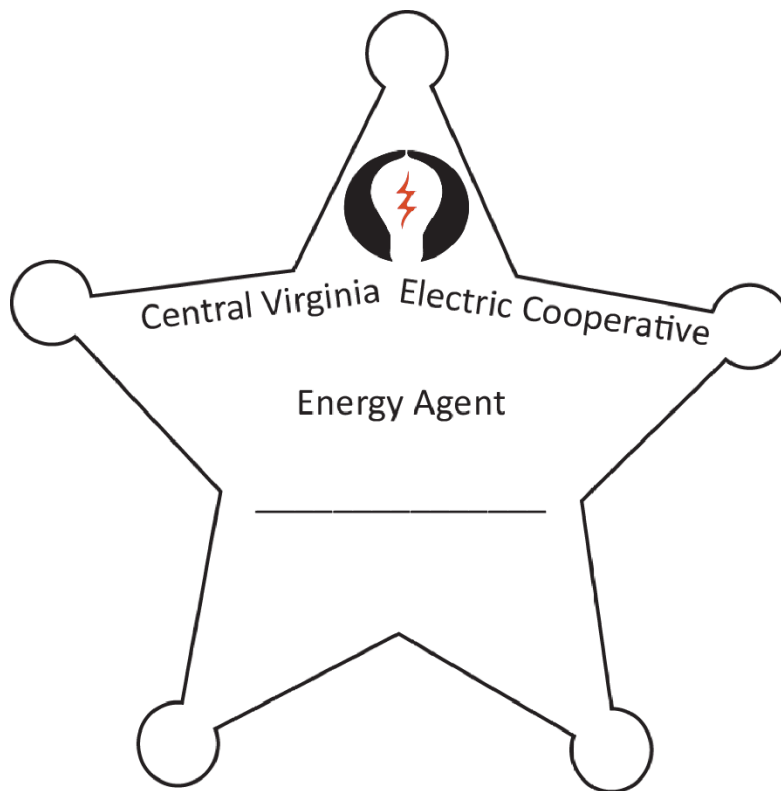


Letter to Parents/Guardians

Dear _____,

Today in _____'s class, we studied electricity. We learned about electricity sources and discovered new information about earth resources like coal, oil, wind, and water which generators use to produce electricity. Many of the resources we use to generate electricity are *nonrenewable*, and will run out some day. However, these resources do not have to run out if we use them responsibly. Today we learned many tips for conserving electricity in order to protect our natural resources. I created posters, performed experiments, and planned how to use energy responsibly in my house. Will you join the energy team and help me conserve electricity at home?

It's going to be an adventure,



Wanted! Energy Waster

Name: _____

For these energy crimes: _____

Reward: _____

