ENERGY SAVING MYSTERY
***KILOWATT OURS* IN-CLASS ACTIVITY**

Overview
This activity is designed to engage students in a simple, hands-on investigative activity to begin applying the ideas of energy conservation and efficiency to their lives. They will examine readily available and affordable items that can be found at home, a local home improvement store, or hardware store, which can help them to be more energy efficient and save money at the same time! The activity works well with small groups of about 2-4 students, depending on class size and arrangement.

Objectives
1. To observe and explore objects that can help save energy
2. To apply new knowledge to real-life applications
3. To discuss ideas in a small group and present ideas to the class

Skills
Critical Thinking
Observation
Small group discussion
Presentation and Listening Skills

Time
Preparation: One hour (including viewing of *Kilowatt Ours*)
Procedure: 20 minutes

Materials
Kilowatt Ours DVD
Box of Energy Saving Items

Preparation
- Create Energy Saving Items box. You may find some items at home or school, and may want to purchase some items from your local retailer.
- Have students complete "What Do You Know about Energy" Activity (optional).
- Show *Kilowatt Ours: A Plan to Re-Energize America* to your students and discuss.

Procedure
1. After viewing *Kilowatt Ours,* introduce the activity. What uses the most energy in a typical home? HEATING AND COOLING!! Do you remember some of the things Jeff did around his house to save energy? What other examples were in the film? Tell the students that they will get to learn more about what they can also do around their house to save energy and money. Most of the actions and items help with heating and cooling costs in a home. Heating water is also a large cost.

2. Divide the class into groups of two to four students and pass out one or two objects from the box to each group. Ask the students to discuss and write down their ideas about:

a. What they think the object is
b. How the object helps to save energy

3. Give the students five minutes to discuss quietly and write their ideas. Let them know there are no wrong ideas, and guide them with more information if they need it. Each group chooses one spokesperson to share about their object with the class.

4. Use the Materials Kit list for answers and ideas.

5. Ask the spokesperson from each group to present their object to the class. Help clarify to the class what each object is and expand on how it helps save energy.

6. At the completion of this activity, introduce the **KILOWATT OURS CHALLENGE** (see Activity 6 in Companion Curriculum) to the class:

Filmmaker Jeff Barrie presents a challenge to the viewers at the end of *Kilowatt Ours* to reduce their electricity use by 25% or more in every home, school and business. In this activity students will create and implement a plan to reach that goal in their homes. They can also create and initiate a plan for the school. Each student will report their actions and results to the Kilowatt Ours energy-savings calculator called the "Kilowatt Counter" (www.CountYourKilowatts.org). Their savings are calculated in dollars, kilowatt-hours, pounds of coal, and carbon dioxide, sulfur dioxide, and nitrogen oxide reductions. Cumulative savings will be reported to students each month in automated emails, and they may also sign up to receive monthly energy-saving tips to continue saving more energy.

Extension for advanced students
Think of additional items, or invent new ones. Brainstorm, draw or even construct the new inventions.

Older students can do research on new technologies and best practices and do presentations or have a debate about solutions.

***Kilowatt Ours* Materials Kit**
Energy-Saving Items

1. **Pipe insulation:** The pipe insulation is the dark gray, foam tube. It encircles hot water pipes in order to keep the heat from escaping, thus insulating the pipe and minimizing the energy needed to keep the water hot.

2. **Insul-foam:** The Insul-foam (piece of styrofoam) is just one example of rigid insulation that can be used in a house to keep the warm air out during the summer and the warm air in during the winter. It is often applied to attic and basement doors.

3. **Radiant Barrier:** Various types of reflective materials, such as the piece of silver bubble wrap, can be placed in attics and under roofing material to reflect heat and keep buildings cooler during the summer, reducing energy consumed by air conditioning units.

4. **Outlet and switch plate sealers:** These block the air passage through electric outlet and light switch plates in buildings, preventing the loss of heat in the winter and gain of heat in the summer. They are used on exterior walls only.

5. **Weather stripping:** Different types of weather stripping material are fastened to the edges of windows and doors to seal and insulate cracks that allow heat to escape or enter the building.

6. **Caulk:** Acrylic sealant is applied in gaps and cracks in a building, such as around windows and vents and along baseboards, helping to keep heat out during the summer and keep heat in during the winter.

7. **Insulating foam sealant:** Foam sealant is sprayed out of a can into gaps and cracks, expanding to take the shape of the crack and creating a permanent seal. Sealing and insulating gaps helps reduce energy used for heating and cooling buildings.

8. **Low-flow shower head:** A low-flow shower head uses less water than other shower heads. Because people usually take hot showers, it specifically reduces the amount of hot water used, reducing the amount of energy needed to heat the water.

9. **Compact fluorescent light bulbs (CFLs):** Many different types of CFLs are available for use in regular light fixtures in homes. They use approximately 75% less energy than a conventional incandescent light bulb.

10. **LED bulbs:** An LED (light-emitting diode) is a super-efficient lighting technology, which is approximately 90% more efficient than a conventional incandescent bulb. They are not yet available for regular use in homes, but are being incorporated in a variety of lighting uses such as night lights, holiday lights, and traffic stop lights.

11. **Power strip:** Common power strips help to eliminate the problem of “phantom load”, the energy consumed by many electrical appliances and devices even when they are turned off. Simply by plugging electronic devices into a power strip and turning the switch to “off” when they are not in use will save energy.

***Kilowatt Ours* Materials Kit**
Energy-Saving Items

12. **Incandescent light bulb:** Incandescent lighting technology was created by Thomas Edison over 100 years ago. Because approximately 90% of the energy the bulbs consume produces heat, rather than light, they are an inefficient lighting technology. Incandescent bulbs are being replaced by more efficient lighting, such as CFLs and LEDs.

13. **Filter whistle:** The filter whistle is the small, orange, plastic object. By making a whistling sound it indicates when a heating and air conditioning filter is dirty and needs to be cleaned or changed. Cleaning and changing filters regularly keeps heating and cooling units running smoothly and efficiently, reducing energy use.

14. **Kill A Watt™ Power Meter:** This tool measures the amount of electricity used by electrical appliances and devices when they are plugged in. The display shows all meter readings including Volts, Current, Watts, Frequency, Power Factor, and Kilowatt-Hours.

15. **Hot water temperature card:** When it is inserted into a cup of hot water the plastic card indicates the temperature of the water. To save energy and money, most hot water heaters should be set between 120 and 130 degrees Fahrenheit.

16. **Energy use thermometer gauge:** The plastic strip shows the approximate temperature of the air around it. To save energy, thermostats should be set at 68 degrees or lower during the winter and 78 degrees or higher during the summer.

17. **Storm window kit:** The heavy-duty plastic is attached to windows to help stop drafts and insulate the windows, keeping the building warmer and saving energy used for heating.

18. **Thermostat:** An automatic device that regulates the temperature of a building by controlling the supply of gas or electricity to a heating unit, by adjusting the temperature at which the thermostat is set.

19. **Duct Sealant:** Water-based duct sealant is the best material to thoroughly seal leaks in the ducts of heating and cooling systems. Most systems lose a great deal of energy through leaks, so sealing them will save lots of energy! Traditional duct tape DOES NOT do a good job of sealing leaks in ducts!

20. **More ideas:** Other types of insulating materials, clothes pins and clothes line, sweater, blanket…

Be creative and think of more items!

STUDENT PAGE (Elementary)

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NAME_____ **DATE**_____

WHAT DO YOU THINK YOUR ITEM IS?

HOW DOES IT SAVE ENERGY?

DRAW A PICTURE OF HOW YOU THINK IT IS USED IN A HOUSE.