



# Pulling the Plug on Phantom Loads

## Objectives

By the end of this activity, students will be able to:

- identify which of their classroom appliances use electricity;
- explain how they can conserve electricity in their classroom; and
- develop a survey of electrical devices found in their school.

## Rationale

Each year there are more and more electrical devices introduced into mainstream society requiring electricity even when they are turned off. Even though many appliances today are more efficient than those in the past, increasing the sheer number of appliances you use may cancel out any potential savings. By integrating the proper use of power strips into our daily habits of turning things on and off, there are significant savings that can be observed, both financially and for the environment.

## Materials

- Copies of *Things That Use Electricity*
- Power strip

## Background

For general information about electricity, refer to the Background in the activity “Classroom Energy Flow.”

When you walk around your house at night, you will probably observe several obvious appliances using energy (e.g., refrigerator running, night light glowing, radio playing), but how many digital clocks and green, red, or blue charger lights do you see? All of these itty bitty lights are drawing electricity even when the appliance is off. There are several names for this phenomenon, including leaking watts, phantom load, and appliance vampires. It is important to try to minimize these leaking watts to help conserve energy and save money. It may not cost a whole lot to keep one SMART

Board® projector plugged in at all times, but if hundreds of small appliances, like projectors, are left plugged in, constantly drawing power, it can be noticeable on a school’s electric bill.

Taking inventory of the electrical devices, including phantom loads, in your school can help bring attention to the appropriate use and over use of electricity in the classroom. If teachers are asked to list all the electrical devices found in their classroom, the results may be surprising. If possible, appliances that draw electricity even when they are turned off should be plugged into a power strip and the power strip turned off when not in use.

## Procedure

### Orientation

Ask students if they have ever walked into a dark room and seen little green, red, or blue lights on the appliances? Why are they glowing? How do they turn them off?

### Steps

1. Introduce the concept of electricity, what it is, where it comes from, and how you know if something uses it.
2. Hand out a *Things That Use Electricity* activity sheet to each student, or pair of students, and ask them to list items that use electricity next to the appropriate letter.
3. Have students list things that are found in their classroom, then items located in other classrooms they’ve been in, and then things they might find in other parts of the school.
4. For each letter of the alphabet, have a different student (or group of students) read their list to the class. Correct any mistakes and ask others if they can add anything to the list. Identify which items listed are found in their classroom. Write these items on a whiteboard or flip chart paper.

**Summary:** Students identify classroom appliances that use electricity even when turned off and how using a power strip can save electricity.

**Grade Level:** K–4

**Subject Areas:** English Language Arts, Family and Consumer Science, Science

**Setting:** Classroom

**Time:**

**Preparation:** 30 minutes

**Activity:** 50 minutes

**Vocabulary:** Electricity, Energy conservation, Inventory, Phantom load, Power strip

## Major Concept Areas:

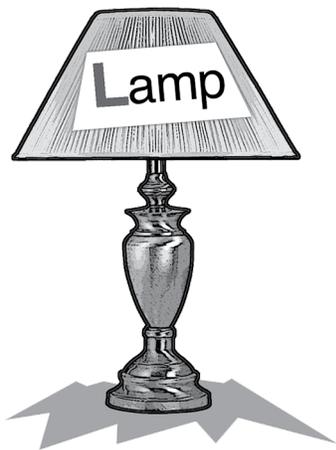
- Quality of life
- Quality of the environment
- Management of energy resource use

**Getting Ready:** Inventory your classroom electrical devices. Note any items that make noise when they are on or if any have little red, green, or blue indicator lights that stay on even after you turn them off.

## Related KEEP Activities:

Have students inventory the entire school, refer to the activity “School Appliance Inventory.”

5. Once the list of possible classroom appliances has been generated, add any major items that may have been overlooked (e.g., computer, TV, DVD player, LCD projector, desk lamp, refrigerator, aquarium, radio).



6. Ask the students the following questions:
- What senses can you use to tell if these appliances are on or off?

Sense	Example Appliances
Sight	Computer screen is on
Smell	Can smell lunch is in the oven
Hearing	Pencil sharpener
Touch	Milk cooler is cool, lamp is warm

- Do any of these appliances need to be left on all the time, or can some of them be turned off when they are not being used?
- Do you think it is important to turn off appliances when they are not needed? Why or why not? (Conserving energy is good for the environment and saves the school money.)
- Do any of these appliances look like they are still on even when they are turned off? How can you tell? (Stand by lights might be on even if appliance is turned off.)
- Would the appliances still look like they were on if they were unplugged? Why not?
- How could you use a power strip to make it easier to unplug appliances?

7. Show students what a power strip looks like and demonstrate how you can essentially unplug appliances by turning the power strip off.

#### Closure

Now that all of the appliances in your classroom that use electricity have been identified, what steps can the class take to reduce electricity consumption in the classroom?

### Assessment

#### Formative

- Did students correctly list items that use electricity that start with their assigned letter?
- Did students correctly identify which electrical appliances may be found in a classroom?
- Could students explain why it was important to turn off or unplug electrical appliances that weren't being used?

#### Summative

What electrical appliances at home could be plugged into a power strip and turned off more often to save energy?

### Extensions

Have one student leave the classroom temporarily while you and the other students turn off and/or unplug all the electrical appliances except for one. Then have the student come into the room and try to identify which appliance is still on.

# Things that Use Electricity

Name \_\_\_\_\_

Date \_\_\_\_\_

A.	N.
B.	O.
C.	P.
D.	Q.
E.	R.
F.	S.
G.	T.
H.	U.
I.	V.
J.	W.
K.	X.
L.	Y.
M.	Z.

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