

Basic Plug Load Activity Guide

1. Engage:

Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions: 10-15 minutes

- **Teacher will lead with a discussion.** A sample discussion could look like this: Electrical appliances are a major source of our school's energy use. What might be the consequences of wasting or misusing these resources? *Answers may vary: Costs money, Greenhouse gases, negative impact on environment.* Today we will do an energy audit by collecting data on how much energy we use in the classroom and discuss ways we might be able to reduce waste.
- **Electricity is measured in units of power called watts.** The amount of electricity we use in a period of time is measured in kilowatt-hours (kWh), or the **energy** of 1,000 watts for one hour. For example, if you use a 100 watt light bulb for 10 hours, you have used 1,000 watt hours of energy, or 1 kWh. In SMUD's service territory, each kWh costs about 12 cents, and emits roughly .66 lbs of carbon.

2. Explore:

Lesson Description – Materials Needed / Probing or Clarifying Questions: 25 minutes

- Pass out Audit worksheet and have students complete Part I of their worksheet (record just the watts of each appliance while it is off and on). Students will now perform an energy audit around the room unplugging appliances and taking measurements.
- **Driving question:** Which appliance do you think will use the most energy over a year?

3. Explain:

Concepts Explained and Vocabulary Defined: 30 minutes or remainder of time

- After completing the Audit worksheet Part I, teacher will lead with a discussion. A sample discussion could look like this: Would anyone like to report his or her group's findings? Did anyone spot potential energy waste or ways we could be more energy efficient? Try to steer the conversation toward plug-in appliances that are not in use (phantom/vampire loads). Have students look at the cost for each appliance while it is off.
- Has anyone heard of vampire load? Does anyone know what a phantom load is? Here is a video describing what a vampire load/phantom load is:
<https://www.youtube.com/watch?v=mNcHUrg9EQY>
How can we better save energy and money?
- Student can now complete Parts 2 and 3 of worksheet.
- Instructor can steer students to 3 strategies for controlling plug-loads:

Changing behavior:

- Unplug appliances with phantom loads when not in use.
 - Cell phone chargers, home entertainment systems, etc.
- Minimize or get rid of equipment you don't need.

Upgrade appliances to energy efficient models (ENERGY STAR).

- CRT computer monitor, refrigerators, clothes dryers.

Using Controls, such as plug timers, which automatically turns off outlets when not in use, or smart power strips.



Plug Timer

4. Additional Resources

- **Slay the vampire video:**
<https://www.youtube.com/watch?v=mNcHUrg9EQY>
- **National Energy Education Development Project – Plug Load Audit workbook:**
<http://www.need.org/files/curriculum/guides/PlugLoads.pdf> or www.need.org for other great energy related material.