



# SOLAR ENERGY FOR THE CLASSROOM



Provided by Pierce Cedar Creek Institute  
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## Activity Overview

Grade Level: 6-8

### General Description

Students will consider how much energy is used to power common household appliances and what the financial cost is to provide the energy used by their household each year.

### Learning Outcome

Students will analyze and calculate how much energy typical household appliances and devices use and will realize the financial costs of powering a typical household.

### Science Content Standards

Content Area: Constructing New Scientific Knowledge (C) I.1.1

Standard: All students will generate scientific questions about the world based on observation.

Content Area: Reflecting on Scientific Knowledge (R) II.1.5

Standard: All students will develop an awareness of and sensitivity to the natural world.

Content Area: Ecosystems (LEC) III.5.6

Standard: All students will describe ways in which humans alter the environment.

Content Area: Geosphere (EG) V.1.5

Standard: All students will explain how technology changes the surface of the earth.

## Determining the Costs of Running Household Appliances

### Materials

- Paper
- Pencils

### Methods

1. Assign each student one room in their home (i.e. kitchen, bathroom, living room, office, etc.) and have them make a list of all of the electrical appliances used in that room throughout the year.
2. Have students guess the amount of energy they think they use in that room each year and what they estimate the cost is to run each appliance for a year.
3. Students can use the following formula to estimate the amount of energy a specific appliance consumes\*.

$(\text{Wattage} * \text{X Hours Used Per Day}) / 1000 = \text{Daily Kilowatt-hour}$

\*Students can find wattage charts for common appliances at:  
<http://thermomax.com/load.htm> or  
<http://www.atlantasolar.com/wattage.html>

If students do not know the watts used by their electrical appliances, they can also calculate the watts by using the following formula:

$$\text{VOLTS X AMPS} = \text{WATTS}$$

**Note: normal voltage for a small appliance is 120 volts.**



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## Methods (cont'd)

4. Students then multiply this by the number of days they use the appliance during the year for the annual consumption. They can then calculate the annual cost to run an appliance by multiplying the kWh per year by their local utility's rate per kWh consumed.\*\*

\*\*Note: Utility kWh rate = the cost of electricity in dollars per kWh. The average kWh may be around \$0.07. Students can also refer to a recent electrical bill to obtain the actual local Utility kWh rate.

5. Have students determine how much it costs to run a household of appliances for a year by teaming up with other students assigned to different rooms of the house.

## Discussion/Assessment

- Were students surprised at how much energy their appliances use?
- Were students surprised at the yearly cost to run these appliances?
- How much did students over/under estimate the cost is to run the appliances in just one room of their household?
- Have students brainstorm ways they could decrease the amount of electricity they use in their households on a daily basis.