

Name: _____

Date: _____

Gizmo Activity: Household Energy Usages

In this activity you will use the *Household Energy Usage Gizmo*™ to investigate the cost of using different energy sources.

Learning goals

After completing this activity, you will be able to ...

- Compare the costs of various energy sources.
- Do a cost-benefit analysis of various energy sources.

Vocabulary: energy consumption, wattage



Warm-up question:

Think of all the electrical appliances you use in your home. Which ones do you think use the most electricity every month?

Explore the Gizmo

The *Household Energy Usage Gizmo* allows you to calculate the cost of the energy used by different appliances in a home. On the **BEDROOM** tab, click the hairdryer on the bed. Information about the **wattage** is given on the **POWER** tab at right. Wattage is the energy that is used by a device each second. It is measured in watts (W) or kilowatts (kW).



1. What is the wattage of the hairdryer? _____

2. Click on the **LIVING**, **KITCHEN**, and **LAUNDRY** tabs. Write down the appliance in each of these rooms with the highest wattage. Record the wattage next to the appliance's name.

3. Which appliance had the highest wattage? _____

Cost of Usage

On the KITCHEN tab, click the electric stove. On the usage tab, set the **Hours** to 3. The daily **energy consumption** of the stove is given at the bottom of the usage tab. Energy consumption is the total amount of energy used in a given time period. It is found by multiplying the usage by the wattage. Energy consumption is measured in kilowatt-hours (kWh).

1. What is the energy consumption of the electric stove? _____

2. Click on the COST tab. Under **Household Cost**, select **1 year (365 days)**. The yearly cost of electricity for an appliance is equal to the yearly consumption (in kilowatt-hours) multiplied by the cost per kilowatt hour (¢/kWh). Assume the average cost of fossil fuels is 7 ¢/kWh . Set the **Cost of Electricity** to 7.0 ¢/kWh . (Note: The prices of energy sources are constantly changing. The prices given here are rough estimates only.)

In the table below, record the yearly cost of powering an electric stove with electricity produced by burning fossil fuels. Then, complete the rest of the table for the other energy sources listed. (Note: You cannot use the Gizmo to calculate the cost of solar energy.)

Energy Source	Cost of Electricity (¢/kWh)	Yearly cost for electric stove
Fossil fuels	7.0 ¢/kWh	
Nuclear electric power	13.5 ¢/kWh	
Hydropower	11.5 ¢/kWh	
Wind energy	7.5 ¢/kWh	
Solar power	30.0 ¢/kWh	

3. From looking at the yearly cost alone, which energy source would you choose to produce electricity for your community? _____

4. Considering what you know about the impacts of that energy source on society and the environment, would you consider choosing a more expensive energy source? Explain your choice. If necessary, continue your response on another sheet of paper.
