



## Home Energy Consumption

### Activity Summary:

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**DESCRIPTION:** Students will calculate the energy consumption of a set of common household devices based on their operating power rating and then investigate the power consumption of other devices in their homes.

**GRADE LEVEL(S):** 6, 7, 8

**SUBJECT AREA(S):** Power, energy, electricity, energy efficiency

**ACTIVITY LENGTH:** 1 hour, 30 minutes

### LEARNING GOAL(S):

- Students will understand power and energy as they relate to their electricity use
- Students will be able to calculate energy consumption and the associated costs
- Students will investigate ways they could reduce their own energy consumption

### STANDARDS MET:

#### Next Generation Science Standards:

MS-PS1-3 Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

### SCIENCE KIT MATERIALS LIST:

- Kill-A-Watt Meters (enough for students to borrow over course of assignment)

### OTHER MATERIALS LIST:

- “Energy and Power” PowerPoint presentation
- “Energy Consumption Cards” handout
- “Energy Consumption Worksheet” student handout

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## Vocabulary:

- Power
- Energy
- Watt
- Kilowatt

## Lesson Details:

### Prep Work:

1. Print and cut out “Energy Consumption Cards” using the dotted lines as a cut guide.
2. Look up the average cost of energy per kilowatt-hour at your school, in your community, or in your state.

### Opening Activity:

1. Explain that you are going to be talking about the amount of power that different common devices require to operate and the amount of energy that they use during operation.
2. Start a discussion about the words “power” and “energy.” Ask students if they understand the difference between those two words. Explain that energy is time-dependent while power is instantaneous. Show the presentation “Energy and Power” to differentiate between these two concepts.
3. Provide the class with a list of some or all of the devices given on the “Energy Consumption Cards.” Ask students to rank the devices in the order of which they think use the most energy.
4. Pass out the cards and have students conduct the calculations for one or two devices listed on the cards.
5. Poll the class and put the devices in the actual order of their energy consumption. Have a discussion about what surprised the class and ask the students whether two hours is really a realistic daily operating time for all of these devices. Which devices would run for more than two hours? Which for less? And ultimately, which devices do they think will consume the most energy over the course of the month?

### Homework or Extension Activity:

Have students reflect on what devices in their own homes use the most energy and then hand out the homework assignment. If available, hand out Kill-A-Watt meters for students to use. Students can also leave the Kill-A-Watt meters plugged in for 24-hours either at home or in the classroom to test some of their hypotheses. The homework assignment can also be done as an in-class activity in small groups, having students test different electrical devices in the classroom.