

# Activity E4b Classroom Energy Audit

## Objectives: Students will...

- Understand how to measure the electricity use of small appliances.
- Understand electricity use in their classroom.
- Form hypotheses on the electricity use of various appliances and the entire school based on collected data.

*Time:* 1 hour

*Location:* Classroom

**Materials:** Watt meters, student worksheets

## Measuring Energy in the Classroom

1. Ask the class to name all of the things in the classroom that use electricity. Write their answers on the board. (NOTE: You will not be able to measure the lighting system with the Kill-A-Watt™ meter).
2. Refer students to their answers in the watt game. Ask students to use these numbers as a general guide to hypothesize how much electricity each classroom appliance uses. Write their answers on the board next to the respective appliance.
3. Demonstrate how the Watt meter works.
  - A. Unplug the appliance to be tested.
  - B. Plug the Watt meter into the outlet (*make sure that the meter is set to kW – just press the button marked “kW” until it appears on the screen*).
  - C. Now plug the appliance into the Watt meter, turn the appliance on, and note the reading.

For things such as an electric pencil sharpener or a CD player, the reading may be different if the appliance is not performing. Have students measure both ways.

4. Divide the class into small groups of 3-4 and give each group a Watt meter. You may either assign each group one appliance or have all groups rotate through all the appliances.
5. After the class has completed their measurements, ask students to report their findings. Record their answers on the board next to their initial hypotheses. How do the actual numbers compare to what they originally thought?

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## Estimating School Energy Use

Using the data collected in the classroom, have students make estimates as to how much electricity the school consumes each year.

1. Total the kilowatt usage in your classroom and count the number of classrooms in the building.
2. Think of other spaces in the school (cafeteria, office, hallways, etc.) and what appliances are present. Make estimates for these spaces as well as for lighting (and don't forget exterior lighting). If the school grounds include facilities such as a stadium, account for these as well.
3. Have the class compile their findings and save them for later comparisons.



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## Measuring Energy in the Classroom

Now let's start thinking about electricity use in your school. Look around your classroom. Make a list of everything you see that uses electricity. Using your knowledge of appliances and power, make estimates as to how much electricity each appliance uses. Write them in the chart below.

Classroom Appliance	How much electricity do you think it uses?	How long is it in use? (in hrs/week)	Actual Reading (in kW)

**Classroom Total:** \_\_\_\_\_

The Watt meter measures the energy used by individual appliances by plugging them into the meter and taking a reading. With this tool, you will conduct an energy audit of your classroom. Record your findings in the "Actual Reading" column in the chart. When you have completed the audit, add your numbers to get a classroom total.

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## Part Two: School Energy Use

Now that you have a better idea of your classroom's energy use, let's make an estimate of the total electricity use of your entire school! This is easier than it sounds. Remember: you are just making a rough estimate; it does not have to be exact.

1. Count the number of classrooms in your school. Multiply this by your classroom energy total.

$$\underline{\hspace{2cm}} \quad \times \quad \underline{\hspace{2cm}} \quad = \quad \underline{\hspace{2cm}}$$

(number of classrooms)                      (your classroom's total energy use)

2. Think of other spaces in the school (cafeteria, library, office, hallways, etc.) and what appliances are present in each. It may help to make separate appliance lists for each area and then calculate how long each appliance is in use. Make estimates for these spaces.

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3. Does your school have any other buildings? Does it have an outdoor stadium or field that has lights? What about a gymnasium? Consider any other spaces and make estimates for these areas.

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4. Now add all of your estimates for a grand total. Be sure to keep these numbers as we will use them later for comparison purposes.

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