

School Activity Guideline

Wasting energy at home: Hands-on activity

Test your knowledge.

Quiz: Match the terms with their and place correct pictures on the last column

TERM	DESCRIPTION
Wattage	How well a resource is used; for lighting, <i>efficiency</i> is a way to look at how much light we get for the amount of energy we have to use.
Lamp	LEDs are the newest and most efficient kinds of <i>lamps</i> . LEDs are little computer parts, and are used in a lot of electronics including computer and television monitors. LEDs are also really expensive, so you may not see many of these.
Efficiency	The amount of power that it takes to make each <i>lamp</i> work.
Luminaire	The technical term for a light bulb.
Fluorescent	These are the standard old-fashioned type of <i>lamps</i> that you likely have in your house. They screw into the <i>luminaire</i> and can get hot.
CFL	These are the lamps that look like long tubes. These are normally used in classrooms, offices and other places where <i>efficiency</i> is a goal.
Incandescent	Compact fluorescent.” These lamps work the same was as <i>fluorescent</i> , but they may not be long straight tubes. Instead, the tubes may curl around, be shaped like a U or be shaped like a circle.
LED	The technical term for the light fixture. <i>Lamps</i> are put into <i>luminaires</i> .

Survey Procedures

Step 1: Load Assessment in Classroom or Office or Home (house)

To assess the load of lights, information about the lights must be recorded. Identify the number of *luminaires* that look the same (are mounted in the same way, have the same type of *lamps* and have the same number of *lamps*).

For each type of *luminaire* that looks the same, write down information in the table below:

- A, describe the *luminaire*.
- B, count how many of those same luminaires you find.
- C, describe the type of lamp (fluorescent, CFL, incandescent or LED).
- D, count how many *lamps* are in each *luminaire*.
- E, write down the *wattage* of each *lamp*. (This information is written on each lamp. To read the imprint/label, turn the lights "off," and use a flashlight to look at the lamp. If the luminaire is up high, have the teacher tell you what wattage (W) is marked on the lamp.

Next, calculate the total *wattage* in your classroom due to that type of lamp, and put that number in Column F. Then, add together all of the total wattages for each luminaire to figure out how much wattage is used in your classroom.

A	B	C	D	E	F
Type of Luminaire	# of these Luminaires	Type of Lamp	Number of Lamps in each Luminaire	Wattage of each Lamp	Total Wattage of this Luminaire Type = B x D x E
TOTAL (add together all values in Column F)					

Step 2: Calculate Energy Use

Now that we know the total wattage of the lighting in our classroom, let's figure out how much energy we use and how much that energy costs the school. To do this, we'll need to get a bit more information.

Cost of Energy Ask your teacher how much energy costs in your state (s/he has provided with a website to get this information). The cost is given as the dollars per kilowatt-hour, or R/kWh. Basically, your school gets charged a certain amount for each kilowatt (or 1000 watts) used for one hour.

Operating Hours You need to figure out how much time the lights are on in your school (count the total number of hours that school is open on a normal day).

$$\text{Yearly Cost} = \frac{\text{Total Wattage}}{1000} \times \text{Hours/day} \times (250 \text{ days/year}) \times \text{R/kWh} = \text{R/year}$$

Does that seem like a lot or a little amount per year on energy used on lighting your classroom? How much does the school pay per student for that lighting?

Step 3: Become Energy Efficient

There are a few ways that you can save the energy used for lighting in your classroom.

1. *Occupancy control* — Turn off the light when there is no one in the room. Occupancy controls can be automatic, with special equipment that knows whether or not there is anyone in the room, or manual where learners and teachers make sure to turn the lights off when they leave the room.
2. *Daylighting control* — Turn the lights off when there is enough light coming in from the windows.
3. *Tuning* — Turn off some of the lights in the room if they are not all needed or turn the lights down if there is a dimmer.

So, let's figure out how much energy you can save from Occupancy controls!

Occupancy Controls — If you could turn the lights off when there is no one in the room, how much energy could that save?

To figure this out, we first need to figure out how many hours this classroom is actually used, not just how many hours per day that the school is open. Ask your teacher to help you figure out how many hours per day there is a class in your classroom. Do not forget to exclude times like lunch, assembly and classroom switching, etc., when no one is in the room.

$$\text{Savings} = \frac{\text{Occupied hours/Day}}{\text{Hours/Day}} \times \text{R/year Total} = \text{R/year}$$



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