

# Classroom Energy Audit

Consider putting student observation skills, math and energy knowledge to work by doing a classroom – or school-wide – energy audit! See the Classroom Energy Audit Worksheet below.

To successfully complete the energy audit, your students will benefit from the use of energy-use meters. The Will Steger Foundation rents classroom energy monitoring kits that are kid and teacher friendly and free. Contact the Will Steger Foundation for more information on kit rentals:

[education@willstegerfoundation.org](mailto:education@willstegerfoundation.org) 612-278-7147

## Materials:

- “Kill-a-watt” meter(s)
- School Energy Audit worksheet
- Classroom board or large sheet of paper

## Instructions:

1. Introduction: TOLBY<sup>®</sup> visit refresher. Ask students some reflection questions related to the TOLBY visit:
  - a. What’s the number one source of electricity in Minnesota? (coal. )
  - b. What did TOLBY tell us coal burning can lead to?
  - c. What is one way we can lessen the amount of coal burned? (use our electricity more efficiently)
  - d. In order to use our electricity more efficiently we need to find out how we are using it. Let’s do an investigation of our classroom.
2. Next, students are to be split into groups of 2-4 individuals. Each group will receive (1) “School Energy Audit” worksheet and will need a writing utensil.
3. Have each group make predictions or guesses about where we use energy around school and write them in their notebooks. What things will use the most? What things will use the least?
4. Now, to do the audit groups need to choose a room to review. Perhaps your classroom is best, or maybe students are allowed to look into neighboring rooms as well. It is best if groups are encouraged to spread out from one another. This helps prevent copying answers.
5. When each group finishes, compile all findings in a table on the board. Perhaps it will look like this:

## CONTACT

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<b>Room #</b>	<b>Number of windows</b>	<b>Item Name</b>	<b>Electricity used when ON</b>	<b>Electricity used when OFF = “Vampire Energy”</b>
Ex. 101	Ex. 4	Ex. Radio	Ex. 15 watts	Ex. 0 watts

Note: It is true that some electrical appliances use energy even when turned “off”. This is especially true of electronics that automatically go into a “stand-by” mode when turned off so they can be easily turned on again. An example of this is a TV that is remote-controlled. In order for the remote to turn “on” the TV it has to be sensing for the signal of the remote, which takes electricity. It’s off, but it’s essentially on too!

6. Processing the audit data and experience can be fun. Consider asking:
  - a. What item, of everything tested, uses the most energy?
  - b. How do our findings compare to our predictions?
  - c. What was one thing that surprised you?
  - d. What new thing did you learn about the room you audited that you didn’t know before?

## Classroom Energy Audit Worksheet

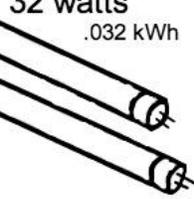
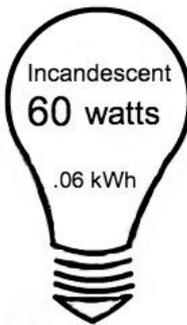
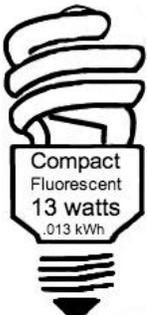
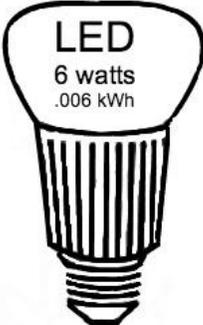
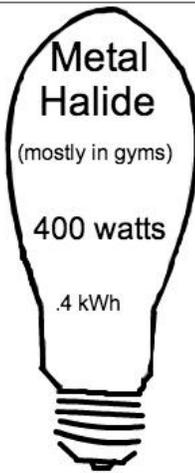
What are the energy needs of your classroom or school? Choose one room (or more) and explore the usage of energy in that place.

Names: \_\_\_\_\_ Class Period: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ Room Audited: \_\_\_\_\_

### LIGHTING

How many light bulbs or light tubes do you find?	<b>A</b>
How many hours are the lights ON each day? (you may need to estimate)	<b>B</b>
Find the type of light pictured below and enter the amount of energy it uses (watts) here	<b>C</b>
Find the total energy used by the lights using this equation:  <b>A x B x C =</b>	<b>Total energy used for lighting (Watts/hour)</b>  <b>A x B x C =</b>

### Which light is it?

<p>Fluorescent <b>Tubes</b> 32 watts .032 kWh</p> 	 <p>Incandescent <b>60 watts</b> .06 kWh</p>	 <p>Compact Fluorescent <b>13 watts</b> .013 kWh</p>	 <p><b>LED</b> 6 watts .006 kWh</p>	 <p><b>Metal Halide</b> (mostly in gyms) <b>400 watts</b> .4 kWh</p>
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## WINDOWS

Number of windows

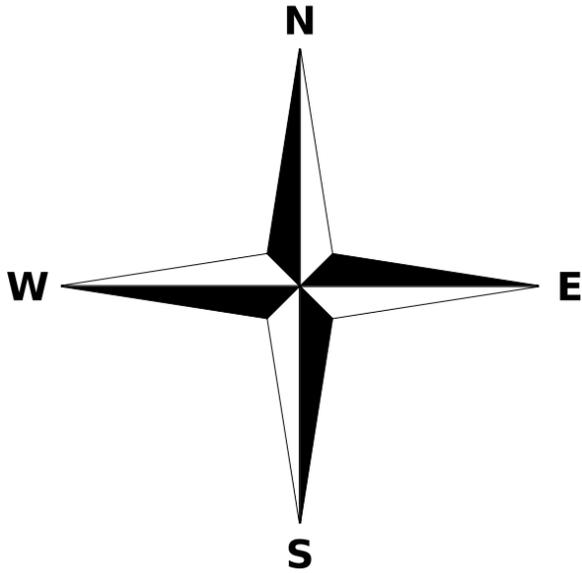
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How many layers of glass do they have? (1 or 2)

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Feel closely: Do you notice a draft near the edges of the window? (yes or no)

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What direction are the windows facing? (circle one in the picture at left)

### Did you know?

The sun rises in the **east** and sets in the **west**. We get the most sunlight from the **south** and have the most shade on the **north** side of homes, buildings and trees.

## APPLIANCES

Test 3 things that use electricity with the “kill-a-watt” meter

Name of item	kWh used when turned <b>ON</b>	kWh used when turned <b>OFF (vampire energy)</b>

### Did you know?

**Vampire Energy** happens when something uses energy *when it is turned OFF*.

