



ENERGY CONSERVATION

BASELINE AUDIT, GRADES 9-12

Consider contacting local, regional or state non-profits, energy providers, and district facilities staff for assistance conducting your audit. Their involvement is a great way to connect to the community, inspire students and demonstrate career possibilities while sharing resource expertise.

Invite parents and community members to participate in the auditing process. Students can take on the role of educator by working with volunteers on citizen science projects. This experience is a great way to build community.

DASHBOARD METRIC

By how much has our school reduced its energy use in kWh?

SURVEY

Before starting the Energy audit or going further, survey your students. Record the average response.

- On a scale from 1-10, 10 being the most important and 1 being the least important, how important is it to be energy literate? _____
- My energy choices can have positive and negative impacts on the environment? _____



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TABLE 1. ENERGY SOURCES AND EFFICIENCY

1. Who is our school's or district's energy provider?	
2. Does any of the provided energy come from renewable energy sources? If yes, which source(s). <input type="checkbox"/> solar <input type="checkbox"/> wind <input type="checkbox"/> hydro <input type="checkbox"/> geothermal other: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No
3. How is heating delivered to the school?	<input type="checkbox"/> hot water boiler <input type="checkbox"/> steam boiler <input type="checkbox"/> forced air furnace other: _____
4. How is cooling delivered to the school?	<input type="checkbox"/> window unit air conditioners <input type="checkbox"/> central air conditioners <input type="checkbox"/> chiller system <input type="checkbox"/> geothermal
5. Is the equipment used for heating and cooling the school certified ENERGY STAR*?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure
6. Are the school's appliances certified Energy Star? (i.e. dishwashers, water fountains, pumps, ovens, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> Partially <input type="checkbox"/> No
7. Is the thermostat self-controlled or controlled centrally/remotely?	<input type="checkbox"/> self-controlled <input type="checkbox"/> controlled centrally/remotely <input type="checkbox"/> unsure

*Products that earn the ENERGY STAR are independently certified to save energy, save money and protect the climate. <https://www.energystar.gov/products/appliances>



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TABLE 1. ENERGY SOURCES AND EFFICIENCY CONTINUED

8. As events are planned at school, is energy use considered when deciding which rooms or parts of the building to use?	_____ Yes _____ No _____ Unsure
9. How much electricity does your school use in a month or quarter?	_____ kWh
10. What was the cost of electricity at your school in a month or a quarter?	\$ _____ _____ unable to access
11. Looking at exterior windows, are any windows cracked?	_____ Yes _____ No
12. Looking at the exterior windows, do any seals around the windows appear to be broken or missing	_____ Yes _____ No
13. Looking at the exterior doors, do the seals and framing seem to be tight and keeping air from escaping?	_____ Yes _____ No

Think about the following questions as you summarize the data in Table 1.

1. Did students/team find any of the collected data surprising? Explain.
2. Did students/team have difficulty accessing specific information? Explain.
3. If students or the team had to rate energy efficiency based only on the data in Table 1 and using a scale from 1-5, where 1 is, needs a lot of improvement and 5 is, exceeds energy expectations, what rating would be given?
4. What ideas or actions does the class/team have about addressing concerns found in the data?



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TABLE 2. CLASSROOM LIGHTING

Refer to the data collected from the class/team worksheets and after analysis write in your final results in the table below.

1. Approximately what percentage of the school rooms were audited?	_____ %
2. Weather and climate impact the amount of energy we use and sometimes the type of energy we use. What month was the data collected and what state is the school found?	Month _____ State _____
3. What is the wattage used by a classroom during an average school day?	_____ watts Divide by 1000 to convert to kilowatts _____ kilowatts
4. Taking all the audited rooms into account, what are the average number of hours lights are left on in the classroom? This excludes, lamps and hanging lights.	_____ hours per day
5. What are the average kilowatt hours (kWh) used by all the classrooms audited?	_____ kWh
6. What is the total cost for lighting in all the audited rooms for one day?	\$ _____
7. What are the total pounds of carbon, lbs./kWh, emitted from all the audited classrooms in one day?	_____ lbs./kWh

Think about the following questions as you summarize the data in Table 2.

1. Was the team/class surprised by the results related to classroom lighting? Explain.
2. What are the team/class's initial thoughts on how to improve energy use related to classroom lighting?



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TABLE 3. ENERGY VAMPIRES

An energy vampire is a device that uses energy even when they are turned off.

Active	Device is on and being used.
Sleep/Standby	Device is in low-power mode.
Off	Device is turned off but still plugged in and ready for action.
Power strip	Device is plugged into a power strip, which should be turned off if it is the end of the day.
Unplugged	If you are checking before or after school, the device should be unplugged, either from the wall or if it is plugged into a power strip the strip should be switched off. Take into consideration that some appliances, such as a mini-frig have to remain plugged in. Never unplug a device or appliance without direction from a permission.

Choose from any of the devices below and/or choose your own devices to add to the vampire list below. Consider using a kill-o-watt meter to learn more about the amount energy used by devices even when the device is off, but plugged in. While it may not be much over the course of the day, each day, hour after hour adds up.

desktop computer (conventional/old school screen)	computer monitor (flat screen)	laptop computer
printer	DVD/VCR player	projector
document camera	SMART board	fish/reptile tank filter and lights
microwave	lamp(s)	refrigerator
diffuser/salt lamp/scent warmer	fan(s)	air pump/compressor
speakers	electronic music equipment (amps, sound systems, radio)	



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Total number of rooms audited. _____

Time of day rooms were audited. ____ before school ____ after school ____ during recess/lunch ____ varied

Device/Appliance	How many total?	Plugged into wall	Plugged into power strip	Active	Sleep/standby	Off	Unplugged
Example: coffee maker	5	1	4	2		2	1

Note: If there are more devices/appliance to report, please add them to the last page or upload a separate document.

Note: Why differentiate between devices plugged into the wall and those plugged into a power strip? Did you know that if the classroom devices and personal appliances are plugged in, they are quietly draining electricity all day, every day, even when they are turned off? Using a power strip to turn off electronics and appliances when they are not in use ensures they are truly off and not using extra electricity. (Energy.gov)

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Think about the following questions as you summarize the information in Table 3.

1. Based on the data collected does the class/team feel energy vampires are a problem? Explain.
2. What questions does the class/team have related to the collected data?
3. What suggestions does the class/team have for improvement?

Review of All Data

1. Based on what is known and has been learned, does the class/team think the evidence supports the claim that the school conserves energy well?
2. Be prepared in the post-audit to explain **patterns** students have identified through their investigations.
3. Be prepared in the post-audit to explain any **cause and effect relationships** students identified between school community energy behaviors and energy use.