



ENERGY CONSERVATION

POST-ACTION AUDIT, GRADES 9-12

Again, 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

Survey the students again. 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? _____

How have student's responses change?



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TABLE 1. ENERGY SOURCES AND EFFICIENCY

Refer to the data collected from the class/team worksheets and after analysis write in your final results in the table below. Since the baseline audit, reflect on the changes that have been made since the baseline audit.

<p>1. Since the baseline audit has the school district's use of renewable energy sources changed? If yes, which source(s).</p> <p>_____ solar _____ wind</p> <p>_____ hydro _____ geothermal</p> <p>other: _____</p>	<p>_____ Yes _____ No</p>
<p>2. Is the equipment used for heating and cooling the school certified ENERGY STAR*?</p>	<p>_____ Yes _____ Partially _____ No</p>
<p>3. Are the school's appliances certified ENERGY STAR*? (i.e. dishwashers, water fountains, pumps, ovens, etc.)</p>	<p>_____ Yes _____ Partially _____ No</p>
<p>4. As events are planned at school, is energy use considered when deciding which rooms or parts of the building to use?</p>	<p>_____ Yes _____ No</p>
<p>5. Looking at exterior windows, are any windows cracked?</p>	<p>_____ Yes _____ No _____ Fixed</p>
<p>6. Looking at the exterior windows, do any seals around the windows appear to be broken or missing</p>	<p>_____ Yes _____ No _____ Fixed</p>
<p>7. Looking at the exterior doors, do the seals and framing seem to be tight and keeping air from escaping?</p>	<p>_____ Yes _____ No _____ Fixed</p>

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

Go to the next page.



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

1. Were the teams/classes able to use data to make changes at the school? Explain.
2. 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? How is this different from the response provided in the baseline audit?
3. What is one action teams/classes took to make improvements?

Go to the next page.



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POST-ACTION AUDIT, GRADES 9-12



TABLE 2. CLASSROOM LIGHTING

Use the handout, *Energy Conservation Calculating Kilowatts, Cost and CO2*. Refer to the data collected from the class/team worksheets and after analysis write in your final results in the table below. Since the baseline audit, reflect on the changes that have been made since the baseline audit.

1. Approximately what percentage of the school rooms were audited? How is the different from the baseline?	_____ % ___ higher ___ lower ___ unchanged
2. Weather and climate impact the amount of energy we use and sometimes the type of energy we use.	Month _____
3. What is the wattage used by a classroom during an average school day?	_____ watts Divide by 1000 to convert to kilowatts _____ kilowatts
4. How has use changed since the baseline (re: #3)?	___ higher ___ lower ___ unchanged
5. 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
6. How has use, hours per day, changed since the baseline (re:#5)?	___ more ___ less ___ unchanged
7. What are the average kilowatt hours (kWh) used by all the classrooms audited?	_____ kWh
8. How has use changed since the baseline (re: #7)?	___ higher ___ lower ___ unchanged
9. What is the total cost for lighting in all the audited rooms for one day?	\$ _____
10. How has cost changed since the baseline (re: #9)?	___ higher ___ lower ___ unchanged
11. What are the total pounds of carbon, lbs./kWh, emitted from all the audited classrooms in one day?	_____ lbs./kWh
12. How have pounds/kWh changed since the baseline audit (re: #11)?	___ more ___ less ___ unchanged



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

1. Since implementing the action, do the teams/classes feel improvements in classroom lighting efficiency have been made? Explain.
2. What is one action teams/classes took to make improvements?

Go to the next page.



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POST-ACTION AUDIT, GRADES 9-12



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.

Table 3 should include the same appliances/devices that were used to collect data in the baseline audit. In addition, the same rooms should be audited to help students construct valid arguments and draw evidence-based conclusions. 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)

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

1. Did teams/classes receive any pushback or negative feedback while trying to address energy vampire use? Explain.
2. What is one action teams/classes took to address phantom energy?



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Review of All Data

1. Based on what is known and has been learned, do the teams/classes think there is evidence to support the claim that the school has-
 - Made improvements to save energy?
 - Created a plan to maintain or improve energy use over time?

2. Did teams/classes observe any patterns in energy use or behaviors when conducting the energy audits? Explain.

3. Provide at least 2 **cause and effect relationships** students observed while conducting the energy audits. Think holistically and about the social systems teams/classes worked with.