School Energy Investigations – Mini Energy Audit

Practice conducting an energy audit by completing the Lighting, Appliances and Temperature sections below.
You will need: Light Meter, Infrared Thermometer, Watt Meter, Various Appliances

Introduction

Conducting an energy audit is a great way to identify how energy is used in your school building and learn ways to conserve or reduce your energy consumption. Your audit will examine three areas of high energy consumption: lighting, appliances and temperature. To get a good idea of how your school building uses energy, as many rooms as possible should be audited. Your classroom will be used to conduct a mini-audit, using energy audit tools to help uncover energy conservation opportunities.

PART 1 - Lighting

Begin the lighting portion of the energy audit by completing A-F in the table below.

General Lighting Audit Questions		
A. What type of overhead lighting is used in the room (incandescent, fluorescent, LED)?		
	YES	**NO**
B. Are the overhead lights turned on/off automatically by motion or photo sensors?		
C. If no, are overhead lights always manually turned off when no one is in the room? (Did you notice if the lights were on when you first entered the room?)		
D. Can the overhead lights be turned on/off separately by row, fixture or bulb?		
E. Does the room receive natural light through windows or skylights?		
F. Are there other lighting appliances in the room other than the overhead lights (desk lamps, floor lamps, string lights, etc.)?		

Practice using the light meter by taking the lighting level in several locations in the room. Record below:

Location	Front of room	Center of room	Back of room	Desk height	Floor height
Light level (Lux)					

Standard Lighting Levels for School Buildings		
School space	Foot-Candles	Lux
Cafeteria	20-30	200-300
Classroom	30-50	300-500
Classroom (Lab)	50-75	500-750
Hallway	5-10	50-100
Gym	30-50	300-500
Kitchen	30-75	300-750
Library (work area)	30-50	300-500
Library (stacks)	20-50	200-500
Lobby	20-30	200-300
Locker room	10-30	100-300
Lounge/Breakroom	10-30	100-300
Office (private)	10-30	100-300
Office (public)	20-30	200-300
Restroom	10-30	100-300
Stairway	5-10	50-100
Storage room	5-20	50-200
Workshop	30-75	300-750

Using the chart above, determine if your classroom is underlit, over lit or does it fall withing range of standard lighting levels?_____

Based on your audit, describe one way the lighting could be improved in this room.

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PART 2 - Appliances

Begin the appliance portion of the energy audit by using the Watt meter to test electrical appliances.

Watt Meter Directions:

1. Unplug the appliance or electronic device you want to test. Be sure to turn it off before unplugging it, if applicable.
2. Plug the Watt meter into a wall outlet near your appliance.
3. Plug the appliance or device into the face of the Watt meter.
4. Power on the appliance or device if necessary.
5. Press the Watt button to measure the number of Watts used instantaneously
6. Turn the appliance off. Measure the number of Watts used.

Electrical Appliance Survey				
Name of Electrical Appliance	Total number in room	Watts (W) ON (Plugged in, turned on, and in use)	Watts (W) OFF (Plugged in and turned off)	Phantom/Vampire Load detected?
				YES NO
				YES NO

Based on your audit, describe one way appliance use could be improved in this room.

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PART 3 - Temperature

Begin the temperature portion of the energy audit by completing the table below.

General Temperature Audit Questions	**YES**	**NO**
A. Is the HVAC system operating at this time of year?		
B. Are windows closed to keep heating and cooling inside?		
C. Are doors (including classroom doors) closed to keep the HVAC system running efficiently?		
D. Are any windows cracked or broken?		
E. Do any doors noticeably leak air?		
F. Are any heating/cooling/air circulating vents in the room blocked by books, papers, jackets, plants, etc.?		
G. Does the room have a thermostat located on the wall?		
H. If there is a thermostat, is it blocked by furniture, equipment, posters, etc.?		
I. If there is a thermostat, is it located near a heat/cold source or air vents?		
J. Are there additional heating or cooling appliances in the room (space heaters, fans, portable AC units)?		

Use the infrared thermometer to complete the table below.

Recommended heating setpoint = 68°F / 20°C, Recommended cooling setpoint = 78°F / 25.5 °C

Temperature Measurement		
Room Location	**Temperature in degrees Fahrenheit (°F) and/or Celsius (°C)**	
K. Front of Room	°F	°C
L. Center of Room	°F	°C
M. Back of Room	°F	°C

Based on your audit, describe one way the temperature could be improved in this room.

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