



Energy Conservation

CALCULATING DAILY ENERGY USE AND COST OF LIGHTING | MIDDLE AND HIGH SCHOOL CLASSROOM AUDIT

Name: _____ Date: _____

Room #: _____ Teacher: _____ Circle one: Baseline Audit Post Audit

Note: **Example with Answers**

TABLE A. LIGHT SWITCHES AND LAMPS IN THE CLASSROOM

- Before filling out this table, write down the different wattages of the bulbs in the classroom by either safely looking at the bulbs directly or checking with your head custodian for the wattage of each tube bulb. Now add your data to the chart below and calculate the equations.

LIGHT SWITCH/LAMP	# OF BULBS/SWITCH OR LAMP	WATTS/BULB	TOTAL WATTS/SWITCH/LAMP	TOTAL KILOWATTS/SWITCH OR LAMP 1 KILOWATT = 1000 WATTS	HOURS ON/DAY	TOTAL kWh/DAY
Switch 1	$16 \times 3 = 48$	17	$48 \times 17 = 816$	$816 \div 1000 = 0.816$	7	$0.816 \times 7 = 5.712$

LIGHT SWITCH/LAMP	# OF BULBS/SWITCH OR LAMP	WATTS/BULB	TOTAL WATTS/SWITCH/LAMP	TOTAL KILOWATTS/SWITCH OR LAMP 1 KILOWATT = 1000 WATTS	HOURS ON/DAY	TOTAL kWh/DAY

Note: Copy and paste this table to a new page if you need more space or recreate the table on another sheet of paper.

- Calculate the sum for the "TOTAL kWh/DAY" (last column). **5.712 kWh/day** | _____ kWh/day



TABLE B. ELECTRONIC DEVICES IN THE CLASSROOM

Note: **Example with answers. Round to the nearest thousandth's place.**

1. Ask your teacher how many hours the room is NOT in use: **17 hours** | _____ hours
2. To determine the wattage of each device in each mode, ask your teacher if you should use a wattmeter, check online, or use approximate numbers from the *Wattage of Common Items* sheet.

ELECTRONIC DEVICE	MODE	WATTS	KILOWATTS 1 KILOWATT = 1000 WATTS	# IN EACH MODE	HOURS NOT IN USE	TOTAL kWh/NIGHT (KILOWATTS x NUMBER x HOURS)
Desktop Computer	Active	73.97	$73.97 \div 1000 = 0.074$	2	17	$0.074 \times 2 \times 17 = 2.516$
	Sleep	21.13	$21.13 \div 1000 = 0.021$	0	17	0
	Off, Plugged In	2.84	$2.84 \div 1000 = 0.003$	1	17	$0.003 \times 1 \times 17 = 0.051$
	Off, Unplugged	0	0	0	17	0

3. Now, choose the electronic classroom devices you will measure, fill in the data, and solve the equations.

ELECTRONIC DEVICE 1	MODE	WATTS	KILOWATTS 1 KILOWATT = 1000 WATTS	# IN EACH MODE	HOURS NOT IN USE	TOTAL kWh/NIGHT (KILOWATTS x NUMBER x HOURS)
	Active		$\div 1000 =$			
	Sleep		$\div 1000 =$			
	Off, Plugged In		$\div 1000 =$			
	Off, Unplugged	0	0	0		0

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ELECTRONIC DEVICE 2	MODE	WATTS	KILOWATTS 1 KILOWATT = 1000 WATTS	# IN EACH MODE	HOURS NOT IN USE	TOTAL kWh/NIGHT (KILOWATTS x NUMBER x HOURS)
	Active		÷ 1000 =			
	Sleep		÷ 1000 =			
	Off, Plugged In		÷ 1000 =			
	Off, Unplugged	0	0	0		0

ELECTRONIC DEVICE 3	MODE	WATTS	KILOWATTS 1 KILOWATT = 1000 WATTS	# IN EACH MODE	HOURS NOT IN USE	TOTAL kWh/NIGHT (KILOWATTS x NUMBER x HOURS)
	Active		÷ 1000 =			
	Sleep		÷ 1000 =			
	Off, Plugged In		÷ 1000 =			
	Off, Unplugged	0	0	0		0

Note: Copy and paste this table to a new page if you need more space or recreate the table on another sheet of paper.

4. Calculate the sum for the “TOTAL kWh/NIGHT” (last column). **2.567 kWh/night** | _____kWh/night

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TABLE C. TOTAL kWh USED FOR THIS CLASSROOM PER DAY

Note: Example with answers. Round to the nearest thousandth's place.

	SUM TOTAL kWh/DAY	COST/kWh IN CENTS	TOTAL COST/DAY
Switches/Lamps (Table A)	5.712	\$0.096	$5.712 \times 0.096 = \$0.548$
Electronic Devices (Table B)	2.567	\$0.096	$2.567 \times 0.096 = \$0.246$

1.

	SUM TOTAL kWh/DAY	COST/kWh IN CENTS	TOTAL COST/DAY
Switches/Lamps (Table A)			
Electronic Devices (Table B)			

2. Calculate the sum for the "TOTAL COST/DAY" (last column). $\$0.794$ cost/day | _____ cost/day

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TABLE D. POUNDS OF CO₂ EMITTED FOR THIS CLASSROOM PER DAY

Note: Example with answers. Round to the nearest thousandth's place.

1. What are the lbs CO₂/Mwh for your state? **971 lbs CO₂/Mwh** | _____ lbs CO₂/Mwh. This number will be used to find the *conversion factor*.

2.	SUM TOTAL kWh/DAY	CONVERSION FACTOR LBS CO ₂ /kWh = LBS CO ₂ /Mwh ÷ 1000	TOTAL LBS CO ₂ EMITTED/DAY
Switches/Lamps (Table A)	5.712	971 ÷ 1000 = .971	5.712 x .971 = 5.546
Electronic Devices (Table B)	2.567	971 ÷ 1000 = .971	2.567 x .971 = 2.492

3.	SUM TOTAL kWh/DAY	CONVERSION FACTOR LBS CO ₂ /kWh = LBS CO ₂ /Mwh ÷ 1000	TOTAL LBS CO ₂ EMITTED/DAY
Switches/Lamps (Table A)		÷ 1000	
Electronic Devices (Table B)		÷ 1000	

4. Sum of the "TOTAL LBS CO₂ EMITTED/DAY" for this classroom. **8.038 lbs CO₂ emitted/day** | _____ lbs CO₂ emitted/day