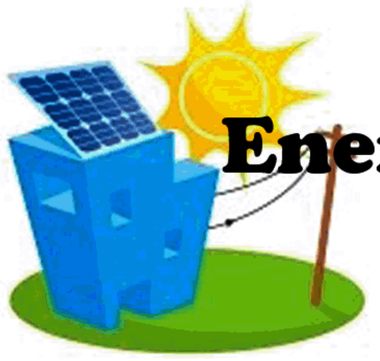

Energy and Electricity Student Assignment Sheet

Date:_____

Name:_____

Show me/Hand in by:_____

Correct and hand in again by:_____

Electricity is a basic source of energy available to most people. It is so basic, in fact, that we take it for granted and just assume it will always be there. Yet somebody has to provide electricity, and it has a cost. If the bills aren't paid, lights go dark, stereos stop playing, refrigerators stop cooling, televisions lose sight and sound, computers shut down, things aren't the same without electricity. As it is already being faced in Pakistan.

For this project you will examine a number of appliances, machines, and tools in your home to see how much electricity they use and how much it costs to operate them. This activity should provide some insight into the importance of electricity in your life (just add up the number of electricity-consuming items in your house), and into the mathematics involved in making calculations about electricity consumption and cost. Electricity is an important area in the study of physics, so you are also being introduced to that branch of science.

Here is your assignment.

I. On the energy and electricity Data Sheet:

A. List at least six items in your home that run on electricity.

B. Under the appropriate heading, record pertinent information you find at home about each item. You are looking for volts, amps, or watts. Find two of these, and then use the equation "watts = volts x amps" from the data sheet to calculate the third. Write "given" in the box with each piece of information that you find written on an appliance. An appliance example is done for you on the data sheet handout. The voltage and wattage information was found written on the , so the word "given" is recorded next to these entries.

Then the equation A = W/V was used to calculate amps for this item.

C. Estimate and record how many hours each item is used in a typical day.

D. Also calculate and record for each item:
1. Watt-hours per day
2. Watt-hours per year
3. Kilowatt-hours per year
4. Cost per year for the electricity used (you will need to find out how much one kilowatt of electricity costs).

II. On a separate math worksheet show all the calculations for your data sheet entries in an orderly way. The answers should be labeled with units.
III. Be prepared to present your work to the class if called upon.
IV. Turn in your completed energy and electricity Data Sheet and the math worksheet that shows all of your calculations

ENERGY AND ELECTRICITY DATA SHEET

VOLTS: The "force" that pushes electricity through a wire.

AMPS: The "strength" of an electric current; the amount of current being pushed through a wire.

WATTS: Unit of electric power or energy.

WATT-HOUR: The amount of work one watt of electricity can do in one hour.

COST PER KILOWATT-HOUR: This is how you are billed for the electricity you use at home. In your area cost per kilowatt hour = _____.

KILOWATT-HOURS: $\frac{\text{watt-hours}}{1000}$

1. WATTS = VOLTS × AMPS
   W = V × A
2. WATT HOURS = W × T (timed used)
3. Most things that plug into a wall socket use 110 volts.
4. Some large appliances and motors use 220 volts.

APPLIANCE OR TOOL	VOLTS $V = \frac{W}{A}$	AMPS $A = \frac{W}{V}$	WATTS $W = V \times A$	HOURS OF USE/DAY ESTIMATED	WATT-HOURS/ DAY	WATT-HOURS/ YEAR	KILOWATT-HOURS/YEAR	COST/YEAR
	GIVEN: 120	CALCULATED: .075	GIVEN: 9	3	27	9855	9.855	70
1.								
2.								
3.								
4.								
5.								
6.								
TOTALS:								