

# CORE ASSESSMENT 1

## Electric Audit

You are fortunate to live in a home that has many electrical appliances that make your life easy and fun. However, using these comes at a cost. What is that cost?

### Objective:

1. Conduct an **electrical energy audit** of your home/school.
  - a. For each appliance, you must determine its energy demands, by identifying..
    - i. **POWER** needed to run the appliance
      1. Use meter to measure Watts
      2. Look at label of appliance to find Voltage & Current and/or Power
    - ii. **TIME** it is used (approximate this value)
      1. Not not 24 hours a day, unless it is in fact used 24 hours a day.
      2. Please note: some appliances are on round the clock, but have different power demands when in use as opposed to "sleeping".
    - iii. **ENERGY** for a day and then for a month.
  - b. Determine the **COST** of running that appliance for a month
2. Design a **mathematical plan to reduce your energy usage**. You should think about the items that you can reasonably reduce and determine the percent by which you reduced your energy consumption.

### Some considerations:

- The month is 30 days long. (Think about how many hours are in one month.)
- The electric Company charges **\$0.XX** per kilowatt hour. (What is a kilowatt-hour a unit of?)
  - Access an electric bill from your family to find the cost per kWh charged.

### Items to Submit:

1. A NEAT table that shows the following: *NO CALCULATIONS ON THIS TABLE!*
  - What devices your house uses
  - Power each device uses (listed in kW)
  - How many hours they will be used each day
  - How many hours they will be used per month
  - Energy used each day in kWh
  - Energy in the whole month in kWh
  - How much money they cost to operate for the whole month.
  - Percentage of use for each of the devices (compare overall total Energy for the month to individual energy for the appliance). The total for all must be 100%.
2. A NEAT, ORGANIZED set of all formulas used with an explanation for each one. You should show the calculations for only one of the devices.
3. Your mathematical plan to reduce energy usage. You must determine the percentage of energy you are saving through your plan. Using the data you collected, calculate and explain how you will save \_\_\_\_% of the cost of running the room/home. Show your work.

## GRADING

### Data:

- (1) \_\_\_\_\_ All devices listed
- (7) \_\_\_\_\_ All categories included
- Power
  - Hours per day
  - Hours per month
  - Energy use per day
  - Energy use for the whole month
  - Operation cost per month
  - Percent of total month energy

### Calculations:

- (1) \_\_\_\_\_ Calculation sheet included
- (14) \_\_\_\_\_ A sample calculation (all formulas & math) for everything listed in data table
- (1) \_\_\_\_\_ Work is organized and written neatly

### Conclusions:

- (2) \_\_\_\_\_ Includes a plan to reduce energy cost by \_\_\_\_\_%
- (2) \_\_\_\_\_ Plan lists to specific steps
- (2) \_\_\_\_\_ Plan is realistic

### Total:

/ 30