Physics 30

Reading an Electric Meter

Purpose: To be able to read an electric meter and determine household energy consumption.

Material: electric meter

Background Information:

Energy is the ability to do work. A kilowatt-hour (kW·h) is used to measure energy consumption in our daily lives. One kW·h is the amount of energy consumed in one hour by an appliance if it uses energy at the rate of 1000 W. Unfortunately energy conversion is always less than 100% efficient and therefore the work completed by an appliance will always be less than 1kW·h.

Energy consumption increases as the power of an appliance increases and as the time the appliance is on increases.

When reading an electric meter you read the dials from left to right and when the arrow is between two numbers the reading is the lesser of the two numbers. The reading shown on this meter is 92 044 kW·h.
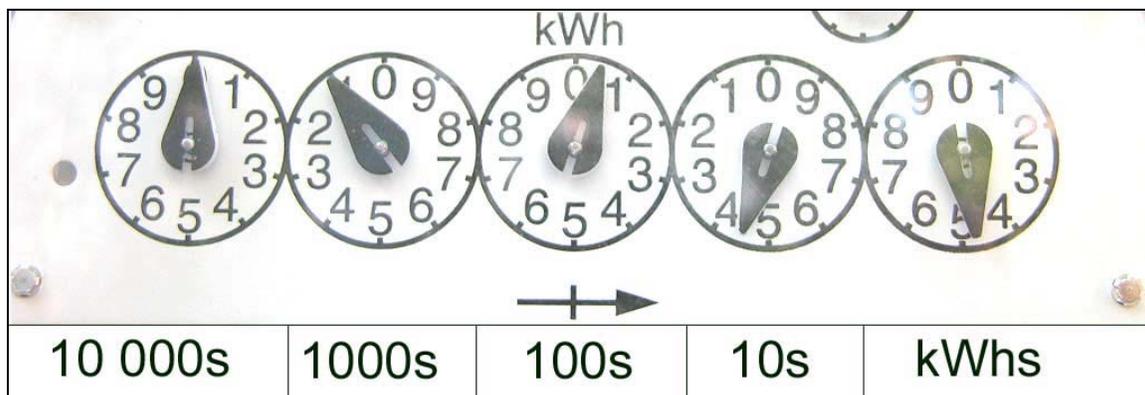
Procedure:

1. Daily Energy Consumption
    Read your electric meter every 2 hours from the time you wake up until you go to sleep. Keep a record of all the appliances that are active during each 2 hour period. Record in a data table. From this data, determine which appliances consume the greatest amount of energy.

| Time Period	Initial Reading	Final Reading	Energy Consumed kW·h	Appliances Used

2. Weekly Energy Consumption
   Read your electric meter at the same time each day for an entire week.
   Record your results.

Day	Initial Reading	Final Reading	Energy Consumed kW·h

Questions:
1. Construct a histogram showing energy consumption during each two hour block of time.
2. Construct a histogram showing daily energy consumption. Why might your graph vary from day to day?
3. What are the readings on the following meters?
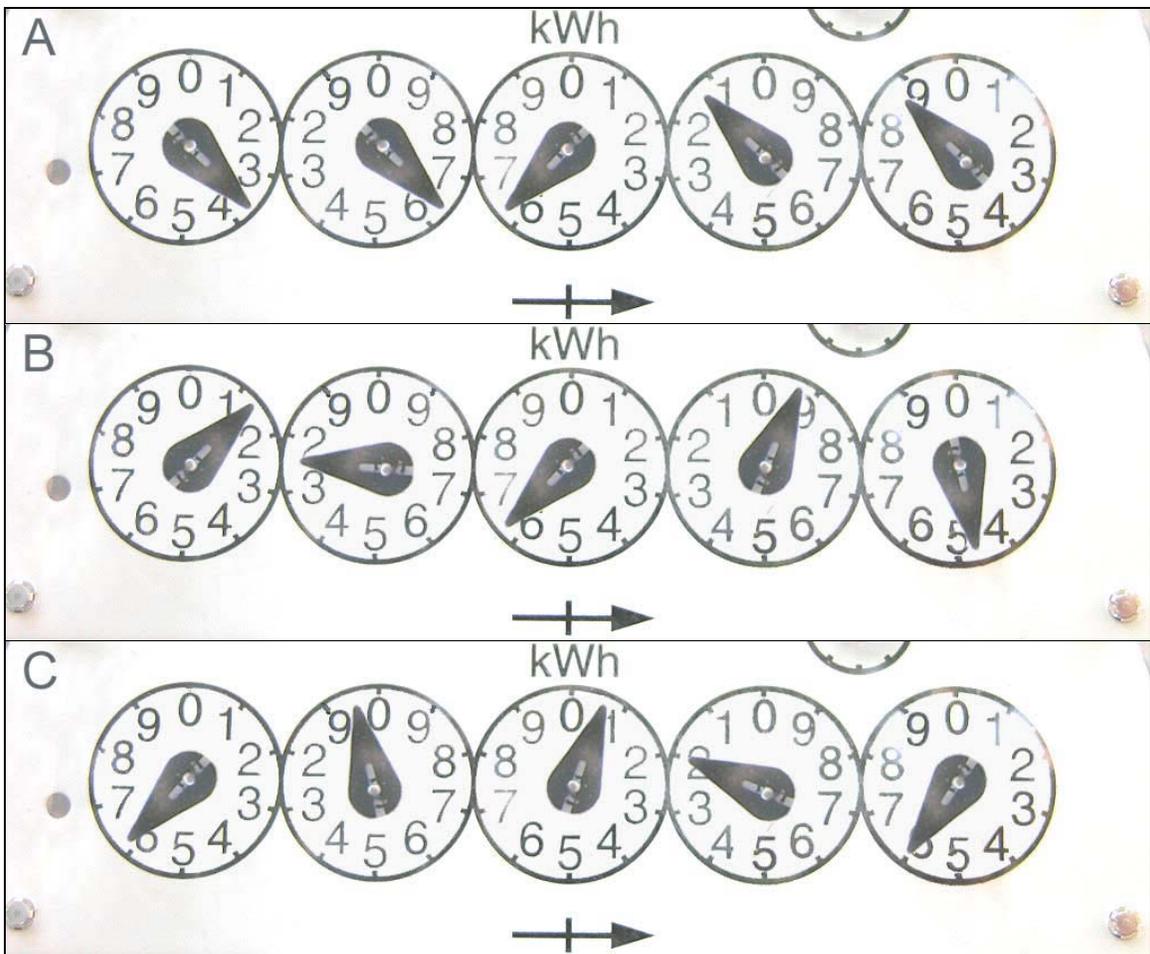
4. If your electric meter at home read 7453 kW·h in February and 7546 kW·h in March, how much energy was used in March? If the cost of electric power was $0.07950/kW·h, what was the cost for this energy?