

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

### Electric Power : Physical Science

- Recall that the rate energy is converted from one form to another is *power*.
- The unit of power is the watt (or kilowatt). So in units form.

Electric power (watts)= current (amperes) x voltage (volts),

where 1 watt = 1 ampere x volts.

1. What is the power when a voltage of 120 V drives a 2-A current through a device?

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2. What is the current when a 60-W lamp is connected to 120 V?

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3. How much current does a 100-W lamp draw when connected to 120 V?

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4. If part of an electric circuit dissipates energy at 6 W when it draws a current of 3 A, what voltage is impressed across it?

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5. Explain the difference between a kilowatt and a kilowatt-hour.

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6. One deterrent to burglary is to leave your front porch light on all the time. If your fixture contains a 60-W bulb at 120 V and your local power utility sells energy at 8 cents per kilowatt-hour, how much will it cost to leave the bulb on for the whole month? Show your work on the other side of this page.

## Electric Power Problems

Name: \_\_\_\_\_

Directions: Show your work and include units.

1. A 750 Watt hairdryer is used for 15 minutes. Calculate the Kwhr used. Calculate the cost to use 15 min. every day for 1 year @ 8 cents/kwhr
  
2. A room has a 60 watt, a 100 watt, and a 150 watt light bulb. How much does it cost to use all of the lamps for 2.5 hr @ 8 cents/ kwhr?
  
3. A current of 11 Amps @ 240 Volts flows through an electric range. If it is used an average of 1 hour/day:
  - a. Calculate the watts used by the range.
  
  - b. Calculate the kwhr used per month.
  
  - c. What is the cost to run the range for one **month** at 8 cents/kwhr?
  
  - d. What is the cost to run the range for one **year** at 8 cents/kwhr?
  
4. A 615 watt refrigerator runs 24 hours/day.
  - a. Calculate the cost to run it for one month (30 days).
  
  - b. Calculate the cost to run it for one year (365 days).
  
5. A bulb is plugged into a 120 Volt outlet. The resistance of the bulbs is 330 ohms.
  - a. Calculate the current through the bulb.
  
  - b. Calculate the watts and kw.
  
  - c. Calculate the cost to run the bulb for 10 hours @ 8 cents/kwhr.