Science & Technology 404

Worksheet – Power & Energy

Energy in W·h & kW·h

1. Your oven has a power rating of 5000 watts.
   a. How many kilowatts is this?

   b. If the oven is used for 2 hours to bake cookies, how many kilowatt-hours (kW·h) are used?

2. You use a 1200-watt hair dryer for 10 minutes each day.
   a. How many minutes do you use the hair dryer in a month? (Assume there are 30 days in the month.)

   b. How many hours do you use the hair dryer in a month?

   c. What is the power of the hair dryer in kilowatts?

   d. How many watt-hours (W·h) of electricity does the hair dryer use in a month?

3. A clothes dryer in a home has a power of 4,500 watts and runs on a special 220-volt household circuit.
   a. What is the current through the dryer?

   b. What is the resistance of the dryer?

   c. How many watt-hours (W·h) of electricity are used by the dryer if it is used for 4 hours in one week?

4. An electric heater uses 15 A when plugged into a 120 V line. It operates for 5 hrs each day.
   a) How much power does the heater use ?

   b) How much electrical energy (in kW·h) will the heater use for the 6 months of winter (182 days)?

Energy in J & kJ

5. It takes 2 minutes to toast bread. The toaster has 10 A flowing through it. (120 V). How much energy (in J) is used in toasting the bread?

6. An MP_3 needs a 0.2 A current to operate. It uses 6500 J of energy each hour. What size battery is needed ?

7. The current through a motor connected to a 60 V source is 2,0 A. How much energy (kJ) does the motor use in 5,0 minutes ?

8. A microwave uses 90 kJ of energy in 2 minutes at 120 V. What current does the microwave need?

9. It takes 234 kJ of energy to make a hamburger at home. The stove uses 10 A of current (120 V). How many minutes will it take?

10. It takes 432 kJ of energy to make a hamburger at home. The stove uses 10 A of current (120 V). How long will it take to cook the hamburger?

11. A heater delivers 2000 J of energy each minute. What current flows through the heater if it is connected to a 120 V line ?

<u>Questions requiring extra steps</u>

12. A 15 Ω heater operates on a 120 V line. How much energy (kJ) is used each hour.

13. A 10 A current flows through a 65 Ω heater for 20 s. How much energy (kJ) will be given off in 2 minutes ?

15. A clock has an operating resistance of 4600 Ω and is plugged a 120 V line.

a) How much current does it use.

b) How much power does it use ?