

1. Define power (use examples)

The amount of work done in a given amount of time. Students may have many examples.

2. Define energy (use examples)

The ability to do work or to cause a change. Students will have many examples.

3. Unit Conversions (Remember, 1 kW=1,000 W and 1 MW=1,000,000 W)

a. 1500 W = 1.5 kW

b. 500 kW = 500,000 W

c. 1000 kW = 1 MW

Using data from the worksheet:

4. Which light bulb uses the most power?

Incandescent

5. Which light bulb uses the most energy?

Incandescent

6. Name one appliance that would be called an energy vampire. Why is it using energy even when it seems to be turned off?

Student observations. Any device that is consuming power when it is turned "off" can be called an energy vampire. It may be using energy to stay warm so that it can turn on quickly or may not be designed to use electricity efficiently. A few examples include: cell phone chargers, VCRs and DVD players, and TVs.

7. How much energy would the following devices use?

<i>a. 15-watt compact fluorescent that is on for 10 hours</i>	<i>150 Wh</i>
<i>b. 60-watt incandescent bulb that is on for 5 hours</i>	<i>300 Wh</i>
<i>c. 1200-watt oven that is used for 1.5 hours</i>	<i>1800 Wh</i>

8. Which uses more energy in one month (30 days)?

<i>a. Energy Vampire that uses 5 watts for 24 hours a day</i>	<i>3600 Wh</i>
<i>b. 100-watt stereo that is used for 1 hour each day</i>	<i>3000 Wh</i>
<i>c. 1000-watt toaster that is used for 0.1 hour each day</i>	<i>3000 Wh</i>

9. What is one way you can save energy at home through conservation?

Possible answers include:

Turning off lights when you are going out of the room

Take shorter showers

Energy conservation is changing your behavior in order to save energy.

10. What is one way you can save energy at home through efficiency?

Possible answers include:

Using CFL bulbs

Installing a programable thermostat

Installing a low-flush toilet

Using Energy Star appliances

All of these calculations/answers below are based off of the per-capita information given on the previous page.

11. Answer the following questions based on the graph at the end of the worksheet.

a. People in what country use the most energy per year?

Iceland

b. People in what country use the least energy per year?

Nigeria

c. Why might there be such great differences in energy use among different countries?

People in affluent countries generally have larger houses, more electronic devices, and they tend to waste more energy. Also people from colder climates tend to use more energy for heating and lighting during winter months.

d. Do you think that people in Europe (such as France, Germany, and the United Kingdom) have a lower standard of living than people in the United States and Canada? Why?

Student observations will vary, but generally people in Europe have lights, heat, and all the electricity they need to lead very modern lives. It is all about doing the same with less and improving efficiency. One place to read more about how much energy we could save and still lead very modern lives is on the Department of Energy's website (<https://www.energy.gov/eere/energy-efficiency-buildings-and-industry>)

e. How many people in India could live their daily lives using the energy consumed by one person from the United States?

Approximately 83 people. In the U.S., the average person consumes 12,314 kWh of energy each year. In India, the average person consumes 1,218 kWh of energy per year.

$$\frac{\text{U.S. 12314 kWh}}{\text{India 1218 kWh}} = 10.11$$