

Name \_\_\_\_\_ Section \_\_\_\_\_

## **Period 2 Activity Sheet: Forms of Energy**

### **2.1 How are Forms of Energy Defined?**

Your instructor will discuss the forms of energy that we will study in the World of Energy. Give an example of each form of energy listed below.

- a) **Mechanical Energy of Motion**
  
- b) **Thermal Energy**
  
- c) **Sound Energy**
  
- d) **Electrical Energy**
  
- e) **Magnetic Energy**
  
- f) **Radiant Energy**
  
- g) **Gravitational Potential Energy**
  
- h) **Strain Potential Energy**
  
- i) **Electrical Potential Energy**
  
- j) **Chemical Potential Energy**
  
- k) **Nuclear Energy**

## 2.2 What Happens When Energy Is Converted from One Form to Another?

- a) Observe the demonstration of an exercise bicycle connected to large light bulbs. List the energy conversions that occur when the bulbs light.
- b) Connect the hand-cranked generator to the solar cell. Shine the flood light onto the solar cell. List the energy conversions that take place.
- c) Observe the demonstration of the toy train. List the energy conversions that occur when the train goes uphill.

List the energy conversions when the train coasts downhill.

- d) Arrange two square magnets on the wooden stick so that one magnet floats above the other. Press the floating magnet down and then release it. List the energy conversions that occur.
- e) Your instructor will explain the electric drill activity. Be sure to hold the cardboard tube over the end of the drill while you perform this activity. List the energy conversions that occur.

## 2.3 Which Devices Involve These Energy Conversions?

Identify devices that illustrate a conversion from the initial to the final energy forms.

- 1) **Chemical Energy**  $\Rightarrow$  **Electrical Energy**
- 2) **Chemical Energy**  $\Rightarrow$  **Radiant Energy**
- 3) **Chemical Energy**  $\Rightarrow$  **Thermal Energy**
- 4) **Electrical Energy**  $\Rightarrow$  **Mechanical Energy of Motion**
- 5) **Electrical Energy**  $\Rightarrow$  **Radiant Energy**

Name \_\_\_\_\_ Section \_\_\_\_\_

- 6) Electrical Energy  $\Rightarrow$  Thermal Energy
- 7) Mechanical Energy of Motion  $\Rightarrow$  Electrical Energy
- 8) Mechanical Energy  $\Rightarrow$  Radiant Energy
- 9) Mechanical Energy of Motion  $\Rightarrow$  Thermal Energy
- 10) Nuclear Energy  $\Rightarrow$  Electrical Energy
- 11) Radiant Energy  $\Rightarrow$  Chemical Energy
- 12) Radiant Energy  $\Rightarrow$  Electrical Energy
- 13) Thermal Energy  $\Rightarrow$  Mechanical Energy of Motion
- 14) Thermal Energy  $\Rightarrow$  Radiant Energy

## 2.4 How Is Energy Stored?

List devices that store the forms of energy listed below.

- 1) Gravitational Potential Energy
- 2) Strain Potential Energy
- 3) Chemical Potential Energy.
- 4) Electrical Potential Energy
- 5) Thermal Energy

## 2.5 What Is the Efficiency of a Series of Energy Conversions?

- a) Connect a small light bulb to a solar cell. Shine the large flood light onto the solar cell so that the small bulb lights.

*(Next, you will try to light the small bulb by shining another small bulb onto the solar cell. Before you try this activity, predict what you think will happen when the small bulb shines on the solar cell. Making predictions can help you learn physics by identifying your ideas about how the world works, as well as make the course more interesting. An incorrect prediction does **not** hurt your grade.)*

Predict whether the small light bulb will light when another small bulb shines on the solar cell. Then try the activity and write the outcome in the answer blank.

Will the small bulb light? **Prediction:** \_\_\_\_\_ **Answer:** \_\_\_\_\_

- 1) Explain why the small bulb did or did not light when a small bulb shines on the solar cell.
  
  - 2) What form of energy goes into the solar cell? \_\_\_\_\_
  - 3) What form of energy lights the bulb? \_\_\_\_\_
  - 4) What form of energy is wasted when the bulb lights? \_\_\_\_\_
- b) Find the efficiency of the conversion process that turns radiant energy shining on the solar cell into visible light from the small bulb.
- 1) If the solar cell requires 100 joules of radiant energy to produce 25 joules of electrical energy, find the efficiency of this step of the conversion process.  
\_\_\_\_\_
  - 2) If 25 joules of electrical energy are converted into 5 joules of visible light in the small bulb, find the efficiency of this step of the process.  
\_\_\_\_\_
  - 3) Use the answers to parts 1) and 2) to find the overall efficiency when this solar cell is used to light the small bulb.  
\_\_\_\_\_
- c) Group Discussion Question: When the solar cell lights the small bulb, the majority of the radiant energy shining on the solar cell is wasted. List the places where energy is wasted. Which forms of energy are wasted?