

Name \_\_\_\_\_

Period \_\_\_\_\_

## Energy Forms & Changes Simulation

<http://phet.colorado.edu/en/simulation/energy-forms-and-changes>

In this simulation, you will be able to “see” several different forms of energy and the changes (transfers) that can occur between them. You are also able to work with a system where you can manipulate the energy input, observe the process of electrical energy generation and manipulate the output.

~ Click on the “Systems” tab. **\*Be sure to click the “Energy Symbols” box** so the different types of energy will be visible throughout the process.

### Getting Familiar With The Options

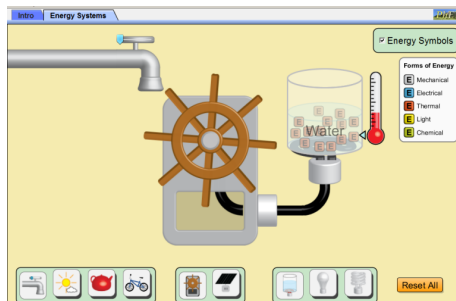
Please experiment with the different source and output options – there are many combinations – then complete the questions below.

1. Meaning of Energy symbols: Which type of energy does each color represent?
  - a. Gray: \_\_\_\_\_
  - b. Blue: \_\_\_\_\_
  - c. Red: \_\_\_\_\_
  - d. Yellow: \_\_\_\_\_
  - e. Green: \_\_\_\_\_
2. Which **energy sources (input)** can cause the turbine (wooden wheel) to spin and generate electrical energy? \_\_\_\_\_
3. Which **energy source (input)** causes the solar panels to generate electrical energy?  
\_\_\_\_\_
4. Which **energy output** (burner heating water, light bulbs, fan) objects work with the *turbine*?  
\_\_\_\_\_
5. Which **energy output** objects work with the solar panels?  
\_\_\_\_\_

### Exploring Energy Transfer

Set up your system as shown in the picture. Let it run for a while and then complete the sentences using the energy symbols to help you “see” the flow of the energy within each system.

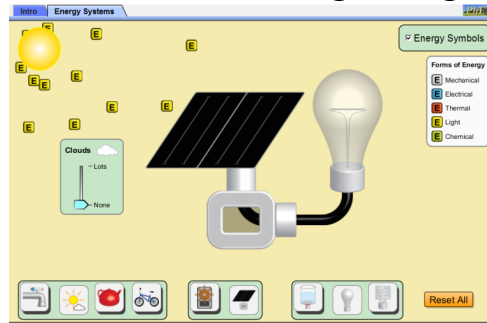
#### 6. Turbine Moved by Medium Water Flow from Faucet With A Water Heater System



**\*In each blank spot write the correct form of energy shown in the simulation.\***

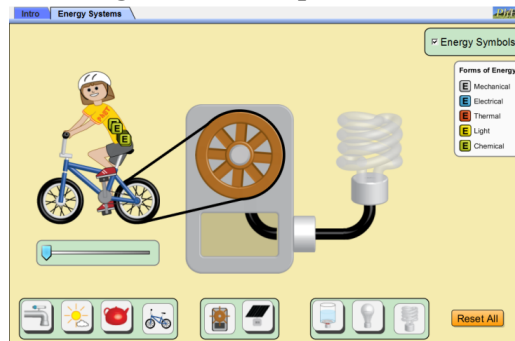
In this system, \_\_\_\_\_ energy from the moving water of the faucet turns the turbine. The \_\_\_\_\_ energy of the spinning turbine generates \_\_\_\_\_ energy which is transformed into \_\_\_\_\_ energy that causes the temperature of the water to increase. The water then becomes steam and gives off more \_\_\_\_\_ energy into the atmosphere.

**7. Solar Panel in Medium Cloud Cover With A Regular Light Bulb System**



In this system, \_\_\_\_\_ energy from the sunlight causes the solar panel to create \_\_\_\_\_ energy which flows into the incandescent light bulb. In the light bulb, the \_\_\_\_\_ energy is transformed into two different types of energy: \_\_\_\_\_ energy and \_\_\_\_\_ energy.

**8. Turbine Moved by Cyclist Pedaling at Medium Speed With A Fluorescent Light Bulb System**



In this system, \_\_\_\_\_ energy from the cyclist is converted to a lot of \_\_\_\_\_ energy and a little bit of \_\_\_\_\_ energy. The \_\_\_\_\_ energy from the turning bicycle wheel spins the turbine which generates \_\_\_\_\_ energy. The fluorescent light bulb converts this energy into two new forms: a lot of \_\_\_\_\_ energy and very little \_\_\_\_\_ energy.

9. Explain why the cyclist must be fed in order to continue to pedal?

\_\_\_\_\_

10. Switch out the *fluorescent bulb* with the *regular bulb* and observe the energy output. What do you notice about the *difference* in the energy and output of these two bulbs?

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

10. In your opinion, which light bulb is more efficient?

\_\_\_\_\_