Student Data Sheet

Name_____

Date_____

Parabolic Solar Water Heater

Data Table 1. Luminescence Readings

Time	Luminescence	Comments

Data Table 2. Water Temperature Readings

Time	Temperature	Comments

Student Data Sheet

Data Analysis

1. Graph time versus temperature. Remember to include title and units. Calculate the slope. Describe the relationship?

   _____
   _____
   _____
   _____

Data Summary

1. What was the average luminescence during the experiment?

   _____
   _____

2. What was the temperature of the water when you started?

   _____
   _____

3. What was the highest temperature reached?

   _____
   _____

4. How long did the water stay at the highest temperature?

   _____
   _____

5. How could you keep the water at the highest temperature longer?

   _____
   _____
   _____

6. What is the relationship between luminescence and temperature of water?

   _____
   _____

7. If you were to increase the amount of water flowing through the tube, what would you predict the slope between time and water temperature to be?

   _____
   _____

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Assessment Questions

1. How can the amount of solar energy collected in a passive solar system be increased?
   _____
   _____
   _____

2. Why is a parabolic curve used as a solar collector?
   _____
   _____
   _____

3. Why is the tubing painted black?
   _____
   _____
   _____

4. How can you design a bigger and better solar collector?
   _____
   _____
   _____

5. What are some limitations of a solar water heater?
   _____
   _____
   _____

6. How could someone use solar energy on a bigger scale to heat water?
   _____
   _____
   _____

7. Are you currently making use of solar energy?
   _____
   _____
   _____

Student Data Sheet

Multiple Choice Questions

1. A solar water heater can be:
   a) a passive system
   b) an active system
   c) a money saver
   d) answers a, b, and c

2. A solar water heater collector often is covered with:
   a) a copper sheet
   b) special glass
   c) a large drain
   d) none of the answers

3. A solar water heater system must have:
   a) wind turbines
   b) PV cells
   c) a storage tank
   d) gas

4. Using solar energy has value because:
   a) solar energy does not pollute the environment
   b) solar energy saves money
   c) solar energy is not "used up"
   d) answers a, b, and c

5. The color black:
   a) reflects the wavelength of all colors
   b) absorbs the wavelength of all colors
   c) should be used to keep cool
   d) is rarely used

6. Use of solar energy is demonstrated by:
   a) a passive solar water heater
   b) clothes drying in the sun
   c) answers a and b
   d) a gas engine

7. A solar water heater:
   a) can heat water only 20 degrees above outdoor temperature
   b) can heat only 5 gallons of water at a time
   c) is best positioned facing north
   d) can heat water to 180 degrees

8. A solar collector has the following:
   a) dark surfaces inside
   b) a turbine
   c) convection currents
   d) biomass

9. As a homeowner in the future you would:
   a) never try using a solar water heater
   b) encourage everyone to use a solar water heater
   c) plan to use only fossil fuels to heat water
   d) not worry about energy resources