

# Lights Light Up Your Life Data Sheet

NAME: \_\_\_\_\_

Make Individual Predictions: (each member of the group should make their own prediction.)

- Which light bulb will generate the most heat? \_\_\_\_\_
- Which light will generate the most light? \_\_\_\_\_
- Which light will use less energy? \_\_\_\_\_
- Which light will cost less to operate? \_\_\_\_\_
- Which bulb will last longer? \_\_\_\_\_

Working with your group, obtain the following materials:

two light sockets, one incandescent light bulb, one compact florescent light bulb, a yard/meter stick, calculator

Use care when handling these bulbs. They will break.

As a group complete the rest of the data sheet.

**Step 1** - Screw an incandescent light bulb into one of the light sockets and screw a compact florescent light bulb into one of the light sockets. With the power off, compare and contrast the two light bulbs. How are they the same and how are they different?

Record your observations:

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**Step 2**- Place your sockets 24 inches (61 cm) apart. With the power off, place a thermometer a few inches (cm) away from each bulb. Read and record the temperature of the air around the bulbs.

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

**Step 3**- Turn on the bulbs. Describe each light bulb again. Do not touch the light bulbs.

Record your observations:

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**Step 4-** Place a thermometer a few inches from each bulb. Record the temperature of the air around each bulb and record the result on the table below every minute for seven minutes.

Time (minutes)	Temperature around Incandescent bulb Fahrenheit (centigrade)	Temperature around Compact Fluorescent bulb Fahrenheit (centigrade)
0		
1		
2		
3		
4		
5		
6		
7		

**Step 5-** Using graph paper plot the data from the table above. Place time on the x-axis and temperature on the y-axis. Write TWO observations below.

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**Step 6-** Using a light meter, measure the light given off by each type of light bulb. Record the level of emitted light in 1-foot (30cm) intervals from 1 foot (30 cm) to 12 foot (3.6 m). Record the data on the table below.

Distance from bulb in feet (metric)	Incandescent bulb level in feet (meter)	Compact Fluorescent bulb level in feet (meter)
1 (30 cm)		
2 (60 cm)		
3 (91 cm)		
4 (1.2 m)		
5 (1.5 m)		
6 (1.8 m)		
7 (2.1 m)		
8 (2.4 m)		
9 (2.7 m)		
10 (3.0 m)		
11 (3.4 m)		
12 (3.6 m)		



**Step 7-** Using graph paper plot the data from the table above. Place the “distance” from the bulb on the x-axis and “light level” on the y-axis. Compare your graphs and write TWO observations below.

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**Step 8-** Record the price of each bulb below.

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

**Step 9-** Determine the amount of electrical energy used by each bulb by using its power rating (Watts) and the amount of time it was on (hours). A power rating is usually printed on the top of the bulb. Record the rating below.

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

Divide the Watts by 1,000 to change to kilowatts. Record the kilowatts below.

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

**Step 10-** Figure out the amount of energy each of the bulbs would consume if they were left on for 10 hours. Use this equation to figure it out. Power rating x number of hours = kilowatt hours

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

**Step 11-** Figure out how much the amount of electricity from step 10 costs. The fee for energy was \$0.07 per kilowatt hour. What is the daily cost to operate each bulb?

Incandescent \_\_\_\_\_ Fluorescent \_\_\_\_\_

**Step 12-** Answer the questions below:

1. Which light bulb generated the most heat? \_\_\_\_\_
2. Which light bulb generated the most light? \_\_\_\_\_
3. Which light used the most energy? \_\_\_\_\_
4. Which light costs less to operate? \_\_\_\_\_
5. Which light costs more to operate? \_\_\_\_\_
6. How much energy and money can you save each year by replacing one incandescent light bulb with one compact fluorescent light bulb? \_\_\_\_\_



7. How long would it take for energy savings from the fluorescent light bulb to cover the added cost of the bulb? \_\_\_\_\_

8. After this lab, which light bulb will you choose to have in your house and why?

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9. In your opinion, should the government pass a law requiring the use of compact fluorescent bulbs? Why or why not?

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