

NAME \_\_\_\_\_

## Light Bulb Or Heat Bulb Experiment: Part 1

**Purpose:** To compare an incandescent light bulb to a compact fluorescent light bulb

**Materials:**

- |                                  |                    |
|----------------------------------|--------------------|
| 1 incandescent light bulb        | 2 "house" boxes    |
| 1 compact fluorescent light bulb | 2 thermometers     |
| 2 lamp bases                     | stopwatch or timer |

**Hypothesis:**

Before starting the experiment, answer each question by circling the answer on the LEFT side of the chart in the **BEFORE** column.

At the completion of the experiment, you will answer the questions again on the RIGHT side of the chart in the **AFTER** column.

\*CFL= compact fluorescent light bulb; IL=incandescent light bulb

| Before |    | Question                              | After |    |
|--------|----|---------------------------------------|-------|----|
| CFL    | IL | Which bulb will get hotter?           | CFL   | IL |
| CFL    | IL | Which bulb will use more electricity? | CFL   | IL |
| CFL    | IL | Which bulb is more energy efficient?  | CFL   | IL |

**Procedure:**

1. Observe each light bulb. Sketch and record their physical characteristics. Be very careful with the bulbs. Do not shake them.

Observations (Physical Characteristics)

| CFL                                      | Incandescent                             |
|--|--|
| <br><br><br><br><br><br><br><br><br><br> | <br><br><br><br><br><br><br><br><br><br> |

2. Put a light bulb in each house. Close the roof. Insert a thermometer through a small opening in the roof making sure it does not touch the light bulb.
3. Record the starting temperature on the data table.
4. At the same time, turn on both light bulbs and start the timer. After one minute take the temperature of each house. Repeat every minute.
5. At the end of 5 minutes, take the final temperature reading and record on the data table. Turn off both light bulbs.

**Light Bulb Data Table:**

| Time (minutes)                          | Temperature of CFL<br>°F | Temperature of Incandescent<br>Light Bulb<br>°F |
|---|--------------------------|---|
| 0 minute<br><b>Starting Temperature</b> |                          |   |
| 1 minute                                |                          |   |
| 2 minutes                               |                          |   |
| 3 minutes                               |                          |   |
| 4 minutes                               |                          |   |
| 5 minutes<br><b>Final Temperature</b>   |                          |   |

6. Calculate the change in temperature for each light bulb.

|  | Temperature of CFL<br>°F | Temperature of Incandescent<br>Light Bulb<br>°F |
|--|--------------------------|---|
| <b>Final Temperature</b>   |                          |   |
| <b>Starting Temperature</b>  |                          |   |
| <b>Change in Temperature (<math>\Delta T</math>)</b><br>Final Temp - Starting Temp =<br>Change in Temp |                          |   |

### Science Journal Questions:

1. Do the results of the experiment support your hypothesis?
2. What characteristics do the light bulbs have in common?
3. How do the light bulbs differ?
4. Energy efficiency is the use of technology that requires less energy to perform the same function. Explain which bulb is more energy efficient.
5. Which bulb is truly a HEAT bulb and not a light bulb?