

## ARE MY LIGHTS WASTING ENERGY WITH HEAT?

### Purpose:

To find out how much heat different types of house lights generate and determine which kind are the most cost efficient.

### Hypothesis:

Different types of lights produce different amounts of heat.

The bulbs that produce the least amount of heat per watt will produce the most amount of light per watt, because the energy has to go somewhere (either heat or light).

### Procedure:

1. Construct a cardboard box that is 12 inches on all sides (a 1 cubic foot space). Let the front side hinge so that you can easily change the light bulbs. Get a parent to connect a power cord to a ceramic light socket and attach it to the center of the bottom of the box.

Mount the thermometer probe in the left rear corner of the box (so that it's not directly above the bulb), and 8.5 inches from the bottom.

2. Place a bulb into the socket and close the box.

3. Wait until the thermometer reads 75.0 F (to start all bulbs at the same temperature).

4. Plug in the light and start a timer.

5. When the timer reaches 5, 10, and 15 minutes, write down the current temperature.

6. Open the box's door, unplug the light, and wait for it to cool down to 80.0 F before removing the light bulb (use an oven mitt to unscrew the bulb).

7. Repeat steps 2 through 6 for each bulb to be tested.

### Conclusion:

1. The hypothesis was correct - the bulbs that generated more heat also produced less lumens - so the energy that could be generating light is wasted in heat.

2. The "Earthlight" bulbs were the most energy efficient bulbs I tested. Even though the heat they produced was only a little better per watt than the others, the fact that they produce so much more light per watt means that you use a far less wattage bulb for the same lumen output. The Earthlight bulbs were also the most cost efficient. This was the big surprise. At \$18 each, I thought that there was no way they would be cheaper to use than the \$0.40 Soft Whites. But when you add in the cost of the electricity, the Earthlights were half the cost!