Curiosity Guide #604
Electric Lights

Accompanies Curious Crew, Season 6, Episode 4 (#604)

Energizing Bulbs

Investigation #7

Description

Power these babies up!

Materials

- 60-watt incandescent bulb
- 13-watt CFL bulb
- LED bulb, equivalent to 60 watts
- Light sockets
- Infrared thermometer
- Light meter
- Ruler
- Paper
- Pencil
- Power meter, optional

Procedure

1) Screw the three bulbs into three light sockets. Note and record the watts for each bulb.
2) Hold the infrared thermometer 10 centimeters away from each unlit bulb and pointing at the center of the bulb. Record the temperature of each unlit bulb.
3) Turn the bulbs on and allow them to warm up for several minutes.
4) Use the infrared meter and record the temperature again from 10 centimeters away and pointing at the same location on each bulb.

5) What did you notice?
6) Use the light meter to measure and record the luminescence of each bulb.
7) What did you notice?

My Results

Explanation
Electrical energy is required to light the bulbs. The power of electricity that is used is measured in watts.

Incandescent bulbs transfer much of their electrical energy into heat, measured in temperature, and light, measured in lumens. Incandescent bulbs therefore give off more heat compared to the other bulbs. Because incandescent lights do give off so much heat, they are more effective for applications like food heat lamps or incubators; however, if the desired goal is light, they may not be the most energy-efficient choice.

LED and CFL lights transfer more of the electric energy into light than heat. As a result, LEDs and CFLs are more cost effective than are incandescent bulbs.

Explore further. You can verify the amount of energy used by connecting the light socket to a power meter.

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