



Bright Ideas

STEM Sims

Lesson 2: Halogen Light bulbs

Halogen light bulbs are very similar to incandescent bulbs, but they have a few key differences. The bulb in a halogen light is made of quartz and is much smaller than an incandescent bulb. Also, the gas inside the bulb is not an inert gas, but a gas from the halogen group. Halogen gases can combine with tungsten atoms that evaporate from the filament and redeposit them on the filament, making the light last longer. The filament can also run hotter than incandescent bulbs, which means that you can get more light for the same amount of energy. However, this also means that halogen lights get much hotter than incandescent lights.

Doing the Science

1. Start the Bright Ideas Simulation by clicking on the “Sim” tab.
2. Click on the halogen light bulb. It will move to the base. Record the number of watts that the display reads on the base in Table 1 below.
3. Click on the timer in the lower right hand part of the screen. When the bulb burns out, the data will be filled in below. Repeat step 2 over and over again until your time is out. A table will appear with all of the data for the halogen row completed.
4. Record your findings in Table 1 below.

Table 1.

| Bulb Type | Bulb Wattage (W) | Average bulb life (hours) | Cost of light bulbs | Electricity cost | Total cost |
|-----------|------------------|---------------------------|---------------------|------------------|------------|
| Halogen | | | | | |

Do You Understand?

1. Look back at the data you collected from Lesson 1. For which bulb is the total cost lower, incandescent or halogen light bulbs?
2. Look back at the data you collected from Lesson 1. For which bulb is the average bulb life higher? Does this value relate directly or inversely with bulb wattage?