



Ways We Create Light

Read About

There is an old Latin saying, *Fiat lux!* which literally means, "Let there be light!" This phrase makes one wonder exactly when humans first "turned on the lights." Until about 200,000 years ago, our ancient ancestors had only the light from the sun and moon (and occasional forest fire) with which to see. With the discovery of fire, our ancestors not only had a means to keep themselves warmed but they could stay up later at night and explore the dark recesses of their caves. Not much changed for the next 199,900 years when it came to making light with fire, although people learned to burn different things such as oil, candles, and the occasional building! Then, in 1879, Thomas Edison perfected the use of electricity to create light without fire with the electric light bulb (many impractical light bulbs came in the decades before).

Incandescent

Edison created the functional incandescent light bulb. This device uses a thin thread, or filament, of high-melting-point metal, such as tungsten, through which a current of electricity is passed. The electrons heat up the metal as they plow their way past the atoms, creating both heat and light. To protect the metal from burning up, oxygen is sometimes removed from the bulb, creating a vacuum inside. If you have ever dropped a light bulb, you are familiar with the loud pop that is created as the air rushes back inside the cracked bulb.

Flourescent

Other than a few changes in the filament, not much has changed over the years in the design of the electric light bulb. However, light bulbs in general have come a long way since 1879. Fluorescent light bulbs – the tube-shaped light bulbs – use a gas such as argon instead of a metal filament to create light. As the electricity arcs through the gas trapped between the ends of the bulb, the atoms becomes so excited that they give off light. Fluorescent light bulbs are increasingly popular because they last much longer than incandescent bulbs, use less electricity than similar-wattage incandescent bulbs, and make 2-4 times more light. A variation of the fluorescent light is the neon light. "Neon" lights actually don't contain just neon. The type of gas used in the tube determines the color of light.

Lasers

Science fiction stories have their favorite form of light – laser light. Lasers are devices that can cause light waves to line up in such a way that the light becomes amplified. The result is light that is so intense that it can burn through solid steel. Today, lasers are used for a lot more than just metal cutters and ray

guns. Lasers are used in medicine to remove cancer cells and as a precise way of measuring objects and distances. Lasers are used to read DVD and CD discs, scan prices at the supermarket checkout, and can even be used as a way of sending messages without wires or large antennas.

LED

Light-emitting diodes (LEDs) are becoming increasingly popular as a means of making light. These tiny devices create light with an extremely small amount of electricity, so they do not get hot and last a very, very long time. LEDs are commonly used for displays in electronic devices such as cameras, remote controls, and watches. Groups of LEDs are also used for automobile tail lights, traffic signals, and exit signs.

The Sun

One innovation in indoor lighting is the use of skylights and light tubes. To install a light tube, a hole is cut in the ceiling of a building, and a small dome is mounted. The dome is connected to a shiny tube that bends its way to the room where the light is needed. When the sun is up, the dome collects the light and sends it down the tube to the room, which becomes filled with natural sunlight. Voila!... light without the use of fire or electricity. And to think it only took people 200,000 years to discover, or more precisely, rediscover the use of the sun as a source of light. *Fiat lux!*