

Understanding Lighting



A very short time ago, we used a lot of energy in the form of electricity to make light to be able to see. Thirty percent of the electricity schools used was for lighting, and homes used about 14 percent of their electricity consumption for lighting. But, ten years ago, many homes, schools, and other commercial buildings used a lot of **incandescent** lighting. These types of bulbs were perfected by Thomas Edison in 1879 and didn't change much for the next 125 or more years! Incandescent bulbs have always been very inefficient. They use about 90 percent of the electricity they use to make heat. This heat makes a wire inside the bulb glow to make light. Only 10 percent of the electricity the bulb uses turns into light!

In 2007, the U.S. passed a law called The Energy Independence and Security Act. This law changed the efficiency of light bulbs we used most often. This law says that bulbs now must be 30 percent more efficient than the original, inefficient incandescent bulbs. The government hoped that these rules would give the people the same amount of light but with less energy use. Most incandescent light bulbs were taken off store shelves and can no longer be purchased.

The lighting efficiency laws led to major energy savings for schools and homes. Newer, efficient lighting now totals only 17 percent of the electricity used in schools.

Bulb Types

There are several light bulb options that meet the new efficiency standards. Energy-saving incandescent, or **halogen**, bulbs are different than original incandescent bulbs because they have a capsule around the glowing wire that is filled with a gas called halogen. This gas allows the bulbs to last three times longer and use 25 percent less energy.

Compact fluorescent light bulbs (CFLs) provide the same amount of light as incandescent bulbs, but use up to 75 percent less energy and last ten times longer. CFLs produce very little heat. CFLs have a small amount of mercury inside and should always be recycled rather than thrown away. Many retailers recycle CFLs for free.

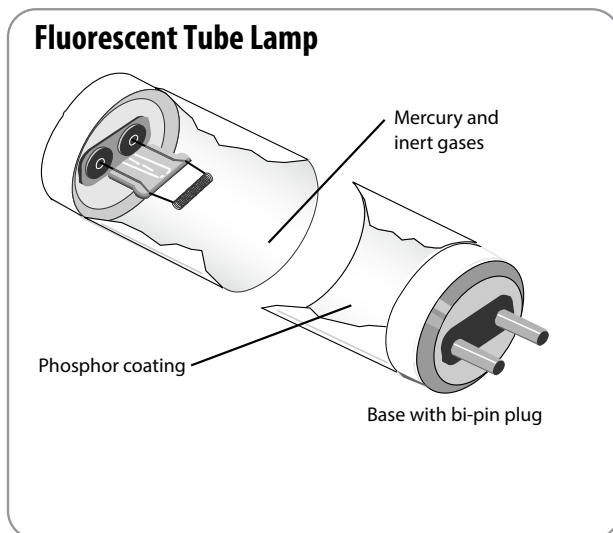
Light emitting diodes (LEDs) are the most popular light bulb today. These bulbs are the same types of bulbs you see in exit signs, clocks on your DVD player, and the on/off light on your remote. This technology can also be used to light your whole house. Lower prices and app-based technologies are causing LEDs to replace CFLs and incandescents. LEDs are one of the most energy-efficient lighting choices available today. LEDs use 75 percent less energy than traditional incandescents, and can last 25,000 hours. LEDs are similar in cost to other bulbs and use even less energy than CFLs.





Lights in School

Lighting is a big part of a school's energy use. Think of the number of classrooms in your building. Each classroom or space must be lit. Because schools need to light larger spaces, they often use different shaped bulbs than the ones you use at home. Schools most often use fluorescent lights in a long tube shape.

A fluorescent lamp is a glass tube. The inside of the tube is coated with a powder that can glow when it absorbs energy, much like stickers you put on the ceiling to glow at night time. The glass tubes are filled with gases. At the ends of the tubes, are the wires called electrodes. When the tube is connected to the electricity in the light fixture, the electrodes heat up. This heat causes the vapors in the tube to get excited and radiate their energy into the powder coating. Once the powder coating absorbs energy it glows to make light.

Schools often use multiple sets of fluorescent tubes in one classroom. These tubes can be different sizes. The smaller bulbs use less energy to create the same amount of light.



INCANDESCENT BULB	HALOGEN BULB	CFL BULB	LED BULB
			
<p>LEDs offer better light quality than incandescent bulbs and halogens, last 25 times as long, and use even less energy than CFLs. LEDs now have a wide array of uses because technology has improved and costs have decreased. CFL use has greatly decreased as LED prices have come down to the similar price as other bulbs.</p>			

No matter how efficient a school's light bulbs are, there are always ways to save more energy on lighting in the school.

- Shut off lighting when you leave the room;
- Use natural light by opening curtains or blinds when you can;
- If the room has more than one light switch, try using only the number of lights needed for the people in the space; and
- Switch to more efficient fluorescent or LED lighting when possible.