

4 ways we make light

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When early humans built the first primitive fires, they gained warmth for cold nights and a way to cook meats and vegetables. But they also gained light, which allowed them to navigate and complete tasks after dark.

Millions of years later, we still gather around fires for warmth and comfort. But while we continue to turn to fire for light, we also have artificial light sources that help make our lives easier, in many ways, than it was for our ancestors.

Here are the 4 main ways we create artificial light:

1. **High-intensity discharge (HID) bulbs** are long-lasting and energy-efficient. The light is produced when metallic additives inside the bulb vaporize. Types of HIDs include metal halide, high-pressure sodium, low-pressure sodium and mercury vapor. With the exception of metal halide, HID light is not aesthetically pleasing. For example, HIDs create the orange “haze” visible in many nighttime aerial shots of urban areas. Because of their appearance, HIDs are typically limited to outdoor security and area lighting in residential applications.
2. **Incandescent bulbs** consist of a small wire, called a filament, between two larger wires inside a glass container. When electric current runs through the filament, the filament glows. The glass bulb keeps the hot filament from burning and melting from contact with air. Incandescent bulbs are based on a fairly simple concept but are not the best source of light thanks to newer alternatives available today. Incandescent light is a by-product of heat; have you ever tried touching an incandescent bulb while it’s in use? This production of heat equals wasted energy.
3. **Fluorescent bulbs** use far less energy than incandescent bulbs, yet they have similar lumen ratings and last up to 20 times longer. The inside of a fluorescent bulb has a coating that absorbs invisible UV light and converts it to visible light. Compact fluorescents (CFLs) are used in a variety of fixtures including recessed downlights, track lights and wall sconces. They come in a broad range of colors and sizes: for example, warm-white CFLs produce warm tones similar to incandescents. Many CFLs are also dimmable. Fluorescents and CFLs have been popular for more than 50 years, but they have several disadvantages. If the bulb’s glass tube breaks, it will no longer produce light. Fluorescents are also less durable and energy-efficient than LEDs. Because they use a good deal of energy, they’re best suited for task lighting applications where bright light is needed.
4. **Light emitting diodes (LEDs)** produce light when electrons combine to create a unit of light, or a photon. LEDs are extremely small, and one light bulb will often include several LEDs. This technology came out in the 1960s but has grown by leaps and bounds in recent years. In fact, LEDs are now more efficient and longer-lasting than any other light source. And, thanks to an expanding color selection, LEDs are becoming more popular in residential and similar applications. While the first LEDs only produced infrared (invisible) light, and their successors offered only red, green or blue light, today we have white LEDs (and many other colors) that are excellent for lighting. They’re especially popular in downlights and some under-cabinet applications. While LEDs are currently more expensive than other options, that’s starting to change.

When choosing your light sources, always make sure you consider factors like task versus ambient lighting, the design or desired feel of a space, primary users of the space, energy usage, and security needs. Long after ancient humans built the first fires, light still has a profound effect on our lives. Choosing the right type of lighting is more important than ever.

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