

Many everyday light sources emit hazardous optical radiation—ultraviolet (UV), intense visible light, infrared (IR), and laser radiation. These exposures can injure the eyes and skin quickly and sometimes without immediate warning.



Hazardous light has characteristics or intensity that can harm the body through **photochemical injury** (chemical changes in tissue) or **thermal injury** (burning/heating). The eyes and skin are the most susceptible organs to damage from hazardous light, and the degree of damage possible depends on the type of light, the intensity, and the duration of exposure.

Types of Hazardous Light & What They Do

1. Ultraviolet (UV) Radiation (100–400 nm)

UV light has three types, UVA, UVB, and UVC, and each behaves differently in the body. UV light can cause sunburns, photokeratitis (“sand in the eyes”), cataracts, or retinal burns, as well as increase the risk of skin cancer depending on the dose and wavelength. UV light is invisible and therefore may present a hazard without a person being aware of it. UV exposure accumulates over time, and the effects may not be noticed/felt immediately.

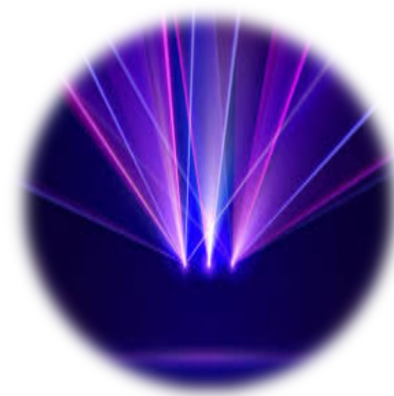


Common sources of UV light are sunlight (both direct and reflected), blacklights/UV flashlights, curing systems, or are produced during welding. Protect yourself from UV radiation by covering your skin and eyes, using sunscreen, and identifying/controlling UV producing devices, such as using personal protective equipment, and containing the produced UV light. The UV forecast for local weather will indicate the current relative strength (and risk) of UV light outdoors.

2. Intense Visible Light (380–780 nm)

Very bright visible light can overwhelm natural eye defenses, causing temporary flash blindness, eye fatigue, and high intensities may damage the retina (light sensitive tissue where light is focused in the rear of the eye to aid vision).

Many products contain warnings for intense visible light, such as high intensity LEDs, laser pointers, scanners, projectors, flash, and strobe lights. Blue light exposure, such as light generated from prolonged use of LED screens, can also affect your body's sleep mechanisms.



3. Infrared (IR) Radiation (700 nm–1 mm)



IR exposure primarily causes burns to tissues and materials. Long-term exposure may contribute to cataract risk. IR light does not pass through the lens of the eye, instead, it would first cause burns to the outer structures of the eye (cornea).

Heat lamps, heaters, high-power incandescent bulbs, the broiler within kitchen stoves, and welders/cutting devices are the most common sources of IR light.

4. Lasers

Lasers produce intense, directional, narrow beams of light (may be UV, visible, or IR), that may have intensities that can cause damage immediately, faster than human reflexes can blink the eye when a laser beam is seen. The eye is the most vulnerable tissue to laser radiation, though depending on the wavelength and intensity, lasers can present ocular, thermal (burns), and fire risks. Lasers are classified based on the risks they present (Class 1 – eye safe, Class 2 – not safe to stare into laser, Class 3 and 4 – direct strike will cause damage faster than human blink reflex). Common sources of lasers are laser pointers, classroom projectors, and working lasers (devices, cutters, welders).



Buy laser pointers from reputable sources; old or inexpensive novelty lasers are commonly drastically more powerful (and therefore hazardous) than their labels indicate. Laser projectors, such as those installed in classrooms on campus, contain high-quality lasers that are no more intense than lamp-based alternatives. Users should avoid extended durations with direct eye exposure to projector light, regardless of the user's comfortability or the light's perceived intensity.