



Recommendations for Laser Pointer Safety and Selection

About Laser Pointers

Laser pointers are completely safe when properly used as a visual or instructional aid. However, they can cause serious eye damage when used improperly. There have been enough documented injuries from laser pointers to trigger a warning from the Food and Drug Administration (FDA). Before deciding to use a laser pointer, presenters are reminded to consider alternate methods of calling attention to specific items. Most presentation software packages offer screen pointer options with the same features, but without the laser hazard.

Selecting a Safe Laser Pointer

1) Choose low power lasers (Class 2 or 3R, formerly 3a)

Whenever possible, select a Class 2 laser pointer because of the lower risk of eye damage. If a more powerful laser is required, presenters may use a Class 3R laser with the understanding that greater responsibility and care are required. Laser devices with other laser classes are inappropriate for use as a laser pointer (see Identifying Laser Characteristics below).

2) Choose red-orange lasers (633 to 650 nm wavelength, choose closer to 635 nm)

Early diode laser pointers were dark red (670 nm wavelength) and difficult to see due to the eye's lower response to red. Newer red-orange lasers are significantly brighter than their dark red predecessors using the same or even less power.

Green and blue laser pointers are available, however each has serious drawbacks. Initially, green will appear brighter than red. However, green may actually be too bright and has been found to leave a distracting after-image on the retina, making it difficult to concentrate on the presentation. Safety concerns have been raised about photo-biological effects from blue light laser pointers (400-500 nm) and they should be avoided.

3) On/Off Switch Ensure that the on switch is a momentary contact type that is designed to shut off the pointer when released. Use of a laser pointed with a locking device to keep the laser beam on is prohibited.

Identifying Laser Characteristics

Identify a laser's class by reading the FDA warning label. Most red laser pointers are Class 2

Each label includes: the starburst insignia, laser classification, maximum output power (in mW), wavelength (in nm) and serial number.



Class 2 lasers have a yellow "Caution" label. Class 3R Lasers have a black and red "Danger" label

and radiate less than 1mW of power. Class 2 lasers are safe if the beam accidentally enters the eye for a short period. The aversion response (blinking or turning the head) is fast enough (0.25 seconds) to prevent injury from the laser exposure. Injuries have occurred when the eye was intentionally exposed for a longer period. Class 3R (called 3a before 2008) emit up to 5mW of power and are capable of damaging the eye with a direct exposure of only a few seconds.

Laser Safety - Avoid Eye Injury

- Aim the laser pointer only at the presentation screen. Point only at inanimate objects - never a person or animal regardless of power;
- Never view a laser beam through the use of an optical instrument (such as binoculars, microscope, etc.) which may concentrate the light energy making it more hazardous;
- Do not aim a laser pointer at a shiny/mirror-like surface. The reflected beam is as hazardous as the direct beam;
- Do not allow children to use a laser pointer unsupervised. The FDA has issued an [advisory](#) warning that laser pointers are not toys and should be used by children only under strict supervision;
- Ensure that the laser pointer is not activated when you are facing the audience;
- The laser should turn off immediately when the switch is released. Use of a laser pointer with a locking device that keeps the laser beam on is strictly prohibited.
- Do not purchase or use an unlabeled laser pointer. Contact the Radiation Protection Office (5-8795) if you have an unlabeled laser pointer.

Laser Safety – Avoid Causing Accidents

Even low power lasers can cause glare, flash-blindness, and afterimage problems when used improperly. Accidents caused by intentionally or unintentionally pointing a laser into the eyes of others are well documented. To minimize the risk of accidental laser pointer related events, follow these guidelines:

- Do not aim a laser beam towards your eyes or the eyes of others;
- Do not aim a laser at aircraft, buses or automobiles;
- Do not aim a laser with in offices or at other buildings;
- Never aim at law enforcement officers or street-gang members. Police officers and others may interpret the pointer as a laser-aimed weapon.