Deakin University
SAFE USE OF LASER POINTERS – Information sheet
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Background: Laser pointers, whilst a useful training tool, can present a hazard that is capable of causing harm to eyes. It is difficult for many people to believe that a device that looks like an ordinary pen-light and runs on AAA batteries can be dangerous. However, within each pointer is a small yet powerful laser diode. Laser pointers have become relatively common and have unfortunately been misused on humans.

Laser classes by the Australian Standard give an indication to their degree of hazard. The classification system is summarised here:

Class 1 - Lasers that are safe under reasonably foreseeable conditions of operation, including the use of optical instruments for intrabeam viewing.

Class 1M - Lasers which are safe under reasonably foreseeable conditions of operation PROVIDED THEY ARE NOT VIEWED WITH MAGNIFYING OPTICS OF ANY KIND.

Class 2 - Lasers that emit visible radiation where eye protection is normally afforded by aversion responses, including the blink reflex. As with all lasers, DO NOT LOOK INTO THE BEAM. The use of viewing optics such as binoculars with Class 2 laser products does not usually create a hazard as long as the objective lens diameter is not greater than 50 mm.

Class 2M - Lasers that emit visible radiation where eye protection is normally afforded by aversion responses, including the blink reflex. HOWEVER, VIEWING OF THE OUTPUT MAY BE HARMFUL IF THE USER EMPLOYS OPTICS WITHIN THE BEAM.

Class 3R - Lasers that present a low risk in the visible range (400-700nm) where aversion responses are used. Aversion responses will not be triggered outside the visible range, hence Class 3R lasers in this range are not safe. Viewing aids (optics such as magnifying glasses) will increase the risk of eye damage. Class 3A lasers from the old classification system are similar to Class 3R lasers.

Class 3B – Lasers that are normally hazardous to the eyes when direct intrabeam exposure occurs. These lasers are unsafe for eye exposure at all wavelengths, but are generally not so powerful that a short exposure would damage skin. Diffuse (dull, non-glossy) reflections are safe if viewed for less than 10 seconds.

Class 4 – Lasers that will damage eyes if directly viewed and are generally powerful enough to burn skin. They may cause fires and ionise the atmosphere when focused. Specular (shiny surfaces) and diffuse (dull surfaces) reflections are also hazardous. Class 4 laser products require a range of additional safety measures.

Laser pointers of Class 1 and 2 are readily available commercially. Unfortunately 3R lasers can still also be purchased at some shops and at many market stalls. As detailed above, class 3R lasers have the potential to cause eye injury and legislation has been introduced in Victoria and other states to ban the use of class 3R laser pointers, thus you must check the class and emission level of any laser pointer before you purchase it.
Legislative Requirements for Laser Pointers

The Control of Weapons (Amendment) Regulations 1998 came into effect on 23 November 1998. Under these regulations it is prohibited to import, sell, manufacture, possess and use laser pointers which emit a laser beam with an accessible emission limit greater than 1mW, i.e. Class 3R. Laser pointers are not readily available in Class 3B or 4.

Any laser pointers of Class 3R should be handed in to your nearest police station. Penalty for possession and use is $6000 or 6 months imprisonment. Penalties for unauthorised importation may be as much as $110,000 under the Customs (Prohibited Imports) Regulations 1956.

Deakin University strictly prohibits the use of laser pointers that are not Class 1 or Class 2 on all University premises.

Safe use of Laser Pointers

Laser pointers are effective tools when used properly. The following considerations should be observed when using laser pointers:

- Never look directly into any laser beam.
- Never point a laser beam at a person.
- Do not aim the laser at reflective surfaces.
- Use only laser pointers with AS/NZS 2211.1 classification Class 1 or Class 2. Lasers classified internationally (e.g. China or the US) are classified using different criteria.
- Laser pointers should not be purchased from local markets or over the internet, as the classification and manufacturing quality is questionable. Purchase only from reputable suppliers.
- Do not use or purchase a laser pointer that has a stated emission level of greater than 1mW.
- Class 2 lasers should be labelled correctly "Caution: Laser Radiation. Do not stare into the beam. Class 2 Laser Product."
- The wavelength (colour) of the laser may determine its hazardous properties. Green lasers are more hazardous than red lasers as the retina is more sensitive in this region of the electromagnetic spectrum
- Do not allow children to use laser pointers.
- Never view a laser pointer using an optical instrument, such as binoculars or a magnifying glass
- Only allow trained personnel to use laser pointers
- All lasers must be included on the University laser register. Please contact the Radiation Safety Officer if you have a laser which you think may not be on the register

For Further Information

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References

AS/NZS2211.1:2004
Monash University Laser Pointer and Controlled weapons information sheet
Charles Sturt University Radiation safety manual