

JHU Homewood Safety Letter	HSL#001.8	
	Issue date	17 Apr 2017
Subject – Laser Pointer Safety	Pages	3

Most lasers, including standard laser pointers, present a hazard to the eye. Laser pointers can cause a startle response, temporary flash-blindness, afterimages, glare, or even permanent eye damage if used improperly. Laser pointers come in several “hazard classes;” classes 2, 3R, and 3B are commonly available.

- **Class 2 lasers** (e.g. supermarket scanners) are deemed safe unless one stares into the beam. The normal human blink reflex will cut off the exposure after about 0.25 second.
- **Class 3R lasers** (e.g. most pen-style laser pointers) offer a hazard if the eye is directly exposed to the beam for more than a few seconds. Class 3R laser pointers should be used with caution and never deliberately pointed at a person, an animal, or an airplane. (Illuminating persons, airplanes, and other conveyances can result in fines and/or jail time.) Class 3R lasers are also called Class 3A.
- **Class 3B laser pointers** (e.g. “high-power,” “military-grade,” or “astronomy” pointers or “handheld lasers”) can have a visible or invisible beam, and they exceed 5 mW power, enough to cause serious eye injury on exposure to a direct beam or mirror reflection (e.g. off a wristwatch, jewelry).

You can identify the hazard class of a laser pointer by examining the hazard sticker affixed to the device. (If there is no sticker, stop using the pointer and get another one.)

- Class 2 lasers usually have a **CAUTION** sticker stating “Class 2 laser product” or “Class II laser product.” (Class 2A or 2M is acceptable as well.) The sticker will state that the laser power is <1mW.
- Class 3R pointers may say **WARNING** or **DANGER** and have a power < 5mW. Class 3B lasers carry a **DANGER** warning and may have power up to 500 mW (0.5W).

Homewood Requirements

You are required to use Class 2 laser pointers in Homewood lecture halls, classrooms, labs, and meeting rooms unless you have received special permission. Contact the Homewood Laser Safety Advocate (LSA). Class 2 laser pointers are now readily available (see back), and it is prudent to use the minimum necessary laser power. **Lab users:** note that this policy applies only to laser pointers; other teaching and research lasers are permitted subject to all University laser policies.

Under most normal lecture conditions in the halls at Homewood, Class 2 laser pointers provide an adequately bright spot. If you are concerned, test a Class 2 pointer in your application before requesting permission to use a more powerful laser pointer. Note that green laser pointers are perceived as approximately 30x brighter than red due to perceptual differences in the human optical system.

If you own a Class 3A/3R or 3B laser pointer, remove the batteries and dispose of it immediately – contact the LSA, Niel Leon (nleon1@jhu.edu) for proper disposal. Class 3 pointers are unnecessary for lecture use except for scientific demonstrations; do not use them in the lecture halls. If you must use a Class 3A/3R or 3B laser pointer for lecture-demonstration or laboratory use, contact the LSA. The LSA will prescribe appropriate hazard controls and provide necessary training.

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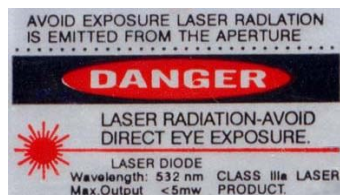
Labels for Class 2 laser pointers

All Class 2 laser pointers will have a label similar to the two show below. They will be yellow with the laser symbol and the Signal Word Caution.



Labels for Class 3a laser pointers

All Class 3a / 3R laser pointers will have a label similar to the two show below. It may be similar to the FDA/CRDH label on the left with the signal word danger or it may be similar to the yellow one on the right.



Note: Many Internet websites offer Class 3B (and even powerful Class 4) lasers to the public. Use only reputable United States vendors for laser pointers, and verify on receipt that the pointer carries a sticker specifying it is Class 2. It appears that laser pointers are not manufactured in the United States; you may use foreign-made pointers purchased from a US vendor.

Please contact the LSA before acquiring, installing, or starting up lasers above Class 2 for any purpose.

Questions?

Contact Niel Leon, LSA (nleon1@jhu.edu or 410-516-6752) with general questions about laser pointers or permission to use Class 3A/3R laser pointers in Homewood lecture halls or other facilities.

NOTE - Permission will only be granted for **bona fide** technical reasons and in rare cases; not owning a Class 2 pointer (or not being able to afford \$20-40 for one) is not sufficient reason.

Those using or wishing to use class 3B or 4 lasers in classroom/teaching lab applications are requested to contact the LSO for further assistance immediately.

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Recommended laser pointers

The following Class 2 models have been evaluated and found suitable for use in the lecture halls at JHU Homewood. Other models may be suitable. If you have a question about these or other models, contact the LSO.

CAUTION – Ordering Laser Pointers from alternate / Web only vendors may result in receiving a laser pointer that is not as specified. NIST in a 2013 paper found that 90% of all Green Laser pointers and 40% of all red laser pointers were not as specified. Some may be counterfeit.

RED POINTERS

- Quartet® “High Impact Class 2 Laser Pointer”, available at office Depot Item #904800 (typical output tested 0.68mW)
- Quartet “Comfort Grip Classic Class 2 Laser Pointer,” available at Office Depot. Item #905072, **BE SURE** – Order the one designated as **Class 2** (typical output tested <0.68mW)
- Acco MP-1202Q “Class 2 Standard Laser Pointer,” available at Staples.

GREEN POINTERS

- Atlasnova Green Laser Pointer with Feedback, GLPF-Class 2, (be **certain** to get the Class 2 variety) <https://www.atlasnova.com/product/atlasnova-green-laser-pointer-with-feedback-apc/> (typical output tested <0.76mW)
- Super Safe Green Laser Pointer <http://store.laserclassroom.com/super-safe-green-laser-pointer/> (typical output tested <0.76mW)

Recommended Computer Presenters (include laser pointer)

- Satechi “Smart Pointer PRO,” available at satechi.com or Amazon.com. Red (R400) or green R800. (output tested as 0.37mW for red and 0.69mW for green)
- Logitech R400 “Wireless Presenter,” available at Office Depot. Item #667827 Red.
- Logitech R800 “Professional Presenter,” available at Office Depot. Item #602793 Green. (typical output tested 0.47mW)