

Thread NSTA Lasers or Laser Pointers Question

----- Original Message -----

From: [Colette DeHarpporte](mailto:Colette.DeHarpporte)

To: physics@list.nsta.org NSTA

Sent: Wednesday, May 11, 2011 1:00 PM

Subject: Lasers or Laser Pointers?

Hello,

I am working on developing a laser designed specifically for teaching and demonstrating key optics principles/lessons in High School Physics classes— do any of you out there use lasers or laser pointers in your physics classrooms? Would you be willing to share with me how you use them and whether you notice any significant limitations when you use them?

Thank you!

Colette

Oh, and I forgot...

Masking tape three lasers in a row and use these to shine on mirrors that are a few feet from the wall. They can trace where the beams go and where the "virtual" or real focus point is for the mirror.

bobagain

Bob Gannon [rmgannon@pacbell.net]

I find that the cheap \$4 flea market red lasers are fine (however, the green are crisper. Purple is more expensive and harder to see).

Secondly, I have them trace refraction on paper as the lasers go through flat, convex, concave lenses.

Thirdly I have them compare the "spread" of the beam in a dark lab room between flashlights and lasers...truly amazing and they get the point.(pun)

Obviously one of the safety things is "detention" if anyone shines the laser at anyone above the neckline...dangerous to retina.

Lots of fun.

Bob

I exclusively use green lasers for labs and demos ... with a little fog from a \$20 fog machine, the entire beam is visible. This is not nearly as clear as with a red laser.

The only thing I think a standard green laser pointer lacks is an easy way to get multiple lasers to be very close to parallel. This is a great way to show what you mean by "converging" and "diverging" for lenses and mirrors. If you're designing a new product, I think putting 3 parallel lasers in (maybe 2 greens and a red?) would be a great addition.

Some sort of a mount for a ring stand (or similar) would be nice as well, especially if it could help to adjust the the direction of the laser and have some kind of a display of what angle the laser is leaving at.

Andrew Bennett
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To mount lasers I "route" out grooves on 2x4 (or 2x6) short boards and lay the lasers in the parallel grooves. Then I screw a small metal bar over them so they don't "disappear". This could be a good way to line them up parallel.

Bob

From: **Steve Cooperman** <skyeman1@dslextreme.com>
Date: Thu, May 12, 2011 at 11:14 PM
Subject: Re: Lasers or Laser Pointers?
To: Bob Gannon <rmgannon@pacbell.net>

Right now, I use different colored LEDs (including UV and IR) to allow kids to see the relationship with different wavelengths. The kids place a diffraction grating over their cell phone cameras and photograph the lights:

<http://members.dslextreme.com/users/oxyday/physics/wavelength-demo-pierce-20100619a.pdf>

I use green and red lasers shining through a diffraction grating onto a white board to demonstrate the same thing with two colors. You can line up the dots of green and red, and then the NEXT dots are spaced differently, with red clearly seen as a longer wavelength.

--- Steve >>>>

First - I love lasers - helped build one to measure fluorescence lifetimes for my doctoral thesis. But just a gentle nudge that, as with so many things, think that we, as teachers, should also emphasize their safe use; that even the inexpensive ones are not toys. We almost had a plane crash recently at the Baltimore Washington airport; some idiot decided to shine a green laser into the cockpit of a jet, blinding the pilots; miraculously, they landed the jet with no injuries. Shortly before that, a police helicopter was also the target of a laser - that one crashed. Recently, I believe, Ocean City, MD passed a law banning the use of lasers - instances where they were directed into people's eyes, blinding them. No, I'm not saying the sky is falling - they're great for instruction, useful, etc., etc., - but maybe we should as mentors also should establish boundaries, just as we should in classroom management 101.

Eric Hildebrand

excellent idea!

Got to add that to the light section.

Maybe will use this time of year since everyone is light hearted by now!

Bob Gannon
SEHS

On May 15, 2011, at 8:52 AM, "Scott Orshan" <sdorshan@gmail.com> wrote:

Even more useful than multiple beams in a straight line is multiple beams that form a triangle or square. Students do not see that the lens diagrams work in three dimensions. I have taped multiple laser pointers around a 4" or 6" diameter piece of pipe. Once you get them parallel, you can shine them into a large concave mirror and get the "Death Star" energy beam effect, where they all converge on the focal point. (Need some fog to make visible.)

You can point them at a large lens and see the beams converging or diverging. Colette, if you had a pre-made setup like this, powered from 120V so you don't have to worry about changing batteries, it would make a very useful item.

Thank you Scott. Our design will have the housings be stackable; they will also be magnetic and include a standard mount base. I love your 3D idea and will give the set up some thought.

Thank you!
Sent from my iPhone

The Department of Energy prohibits the use of Class IIIA laser pointers in their facilities.

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