

Experiments For High Power Green Laser Pointers

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Feb. 29, 2008 - [PRLog](#) -- Doing experiments with green laser pointers can be both educational and a load of fun. This article provides an outline of a number of good experiments for green laser pointers.

Conducting experiments with laser pointers is both educational and loads of fun. Listed below are some basic experiments you can perform with green laser pointers. Please when experimenting, always keep safety foremost in mind.

Thermal experiments

Burning plastic

This is the easiest of the thermal experiments to perform and only requires a 55mW laser pointer.

Instructions/tips:

- Use thin black plastic such as shopping bags.
- Hold the laser pointer very close to the bag and rest it on something solid to keep the beam steady.
- The first sign of success will be tendrils of smoke from the point you are aiming at.
- When you've finished, holding the plastic up to the light should reveal small pin pricks burnt into the plastic.

Bursting or popping balloons

Laser pointers of roughly 75mW or higher in power can pop dark or black colored balloons.

Instructions/tips:

- Dark or black balloons are best because they are better at absorbing green light. White or green balloons will have too much reflection and the absorbed energy will not be enough to pop the balloon. If you don't have any dark/black balloons, you can use a sharpie (black texta) to put a black spot on the balloon that you can aim the laser at.
- Make sure the balloon is fully blown up because if it is not blown up properly and lacks tension, popping it will be difficult.

Lighting matches

This is harder to do than popping balloons and requires a minimum of 95mW or higher laser pointer.

Instructions/tips:

-As with balloons, the color of the match head is also important. If the color is too light such as white, too much energy from the laser beam will be reflected and there will not be enough energy remaining to light the match. Black or dark red matches are ideal. You can also use a sharpie to darken the match head.

-Make sure both the laser pointer and the match are fixed and not moving

-don't hold the laser pointer too close to the match or you may get ash and debris on the laser pointer lens.

Cutting black electrical tape

Another one of the more difficult burning experiments that requires a laser pointer of at least 95mW in power.

Tips/instructions:

-Attach the loose end of the tape to a fixed point such as the edge of a table then leave roughly 10 cm of tape with the tape roll suspended at the end. The tape roll will create tension that makes cutting the tape easier.

-keep the laser steady and aimed at the edge of the tape.

Mirrors

Experiments with mirrors can range from the very basic to the very advanced and are only limited by your imagination. The advantage of mirror experiments is that there are no specific power requirements and low powered laser pointers will be just as effective (but less visible) as the higher powered laser pointers.

Laser accordion

Very easy to do and can be visually very impressive.

Instructions/tips:

-Carefully line up two rectangular mirrors of similar size parallel to each other.

-change the angle of the laser pointer to the mirror to create more beams between the mirrors

Measure your pulse

Sounds difficult but is actually very easy to do.

Instructions/tips:

-attach a very small mirror (no more than 4cm in diameter) directly over the inner part of your wrist where pulse is normally measured. Use a small round object like blue tack or chewing gum (messy but effective) to attach the mirror to your wrist.

-reflect the laser pointer beam of the mirror onto a smooth surface such as a wall at least 4 meters away.

-if the laser pointer and your wrist are held steady, the rhythmic movements in the reflected image on the

wall will be your pulse.

Security alarm

This experiment is an extension of the laser accordion experiment.

Instructions/tips:

-at a security point such as an exit/doorway or a hall way, line up two rectangular mirrors and create a grid of laser beams. The beam should be aimed to fall on a photoelectric detector that is connected to an alarm.

-once the beam is broken, the alarm will be activated.

-IR lasers could be used to create an invisible security alarm.

Cool beam effects

There are a number of experiments ranging from very simple to quite advanced that can create beautiful beam effects such as the ones listed below.

Ice

The crystalline structure of ice is full of hollows, gaps and imperfections that will scatter and diffract the laser beam.

Laser drawing and writing

Instructions/tips:

-make sure the exposure time on your camera is at least 2 seconds

-aim the laser pointer beam at a smooth non reflective surface with a good contrast

-then use the beam point to write/draw pictures

-use smoke or fog to provide additional effect

Bend light

Using wave propagation theory, you can actually bend light from your laser pointer and see it clearly.

Instructions/tips:

-Aim the laser at a smooth surface 4 meters away such as a white wall

-Use an object with a very precise smooth edge such a new razor blade.

-partially block the laser beam with the edge and note the interference patterns produced.

-the patterns will not be flat or smooth. Instead there will be a diffraction pattern

Moving objects

No kidding, high power laser pointers have a beam powerful enough to move objects. At least they can move the vanes in a Crookes radiometer.

-instructions/tips:

-you need a Crookes radiometer that has a complete vacuum in the globe and the vanes have virtually frictionless support.

-aim the laser pointer beam at the silver side of the vanes and they should start to move very rapidly.

Beam splitting

There are various methods and numerous pieces of equipment that can split the beam of a laser. This one of the simplest methods.

Instructions/tips:

-Using microscope slides, split the laser beam by angling the beam on the slide.

-For really spectacular results, you can use a diffraction grating.

Time tunnel

Laser pointers can be used to create a light tunnel reminiscent of Doctor Who and several other famous science fiction programs

Instructions/tips:

-you attach a mirror to an electric motor at a slight angle.

-aim the laser beam on the mirror when the motor is turned on and the laser beam will spin around itself to create a laser cone or tunnel

Website: www.dragonlasers.com

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