

## Optics Final Project

**Goal:** Design and construct a model of an optical device to display for your classmates in a “museum walk” on the last day of class. (Friday 30 January)

### Requirements:

- Some kind of physical model, ideally something your classmates can look through or use
- A museum display board on one 11x17 inch piece of paper. This will go into your main lesson book too. It must include:
  - History of the device (when it was invented, by whom, etc)
  - Description of what it is used for
  - Explanation of how it works
  - Ray diagram illustrating how it works

The device you choose can be as simple or as complicated as you like.

### Device ideas:

- Refracting telescope
- Reflecting telescope
- Compound microscope
- Magnifying periscope
- Camera
- Zoom lens
- Telephoto lens
- Stereoscope (3D image viewer)
- Pseudoscope (switch the views of left and right eyes)
- Infinity mirror box (optical illusion)
- Model of human eye
- Overhead projector
- Opaque projector
- Color-mixing light box
- Endoscope (used for looking inside someone’s body during surgery)
- Camera lucida (drawing device)
- Scratch hologram
  - <http://amasci.com/amateur/holo1.html>
- Vermeer painting device
  - <http://www.mysanantonio.com/entertainment/arts-culture/item/Animation-Tim-Jenison-s-Vermeer-device-27624.php>
- Invisibility cloak
  - <http://www.rochester.edu/newscenter/watch-rochester-cloak-uses-ordinary-lenses-to-hide-objects-across-continuous-range-of-angles-70592/>

If you have another idea, let me know! If it is cool and feasible, I will probably say, “Go for it!”

### Alternative project:

If you have an optics-related project idea that does not lend itself to building a model of a device, let me know and we’ll think about an alternative way to present it. Some examples:

Investigate how eyeglasses work. It’s not feasible to make specially shaped lenses, but you could design an experiment to measure different properties of the eyeglasses of your classmates.

Investigate color astro-photography by using an internet-controlled telescope to take photographs of astronomical objects and combine them into color images the way astronomers do.  
<http://www.microobservatory.org>