

Optics Main Lesson January 2015

Syllabus (as of 30 Jan 2015)

Ms. Swanson

General Expectations:

- All main lesson book assignments, especially lab write-ups, should include enough context so that it would make sense to someone who is not in the class.
- One rough draft is required for all main lesson book assignments, but if you want to turn in additional drafts I will provide further feedback.

Week 1: (4-day week due to cold day) exploring vision, light, and darkness

Ancient Greek ideas of vision, Darkness experience, Candle and pinhole lab

Assignments to go in main lesson book:

Reflection on darkness experience (rough draft due 7 Jan)

- Impressions of darkness, thoughts on candlelight, reflections, Greek ideas.
- Include artistic representation (drawing, poem, etc) in final draft.

Candle and pinhole lab writeup (rough draft due 12 Jan)

- Include details of setup, description of your most interesting observations.
- Include any quantitative measurements you made.
- Include diagrams if they are helpful to understand what you observed.

Week 2: reflection and refraction

Candle and mirror lab, Refraction through fluids lab, ray model discussion and problems

Assignments to go in main lesson book:

Candle and mirror lab writeup (rough draft due 14 Jan)

- Include description and diagram of experimental setup
- Include graph with a controlled variable on the x-axis and a measured variable on the y-axis

Refraction through fluids lab writeup (rough draft due 15 Jan)

- Include a description of one observation we did of light through fluids or glass
- Describe your ideas on how the observation could be explained.

Summary of class understanding of the behavior of light (rough draft due 26 Jan)

- Diagrams and explanations for: rays, reflection (specular and diffuse), refraction. Explain one observation from a demo or lab using ray model.

Week 3: (3-day week due to MLK Day): applications of optics

Fishtank challenge, Optics in astronomy, Lens lab, Intro to optical device project

Assignments to go in main lesson book:

Fishtank challenge writeup (rough draft due 26 Jan)

Lens lab writeup (rough draft due 30 Jan)

Other assignments:

Choose the optical device to build for your project and begin research (due 23 Jan)

Week 4: (3-day week due to blizzard) Optical devices

Optical device project work time

Assignments to go in main lesson book:

Optical device research writeup

Other assignments:

Prepare museum-style display for optical device for Monday 2 Feb

Main lesson book is due Tuesday 3 Feb