

PHY385H1F – “Introductory Optics”
Practicals Day 1 - Introduction
September 19, 2011

Group Number (number on Intro Optics Kit): _____.

Facilitator Name: _____.

Record-Keeper Name: _____ . [Turn this sheet in for marks]

Time-keeper: _____.

Computer/Wiki-master: _____.

Practicals Policies

Practicals Activities will be turned in and marked at the end of the practicals section. They will be marked and turned back to you by the next session, and the marks will be worth 15% of your mark in the course. In the end, only the best 9 out of 10 marks will count, so you may miss one practical this semester with no penalty. All work is team work, done in an assigned team of 3 or 4 students, and everyone in the team shares the mark. Ideally, you will work with one team for the first 5 practicals, then we will be scrambling teams for the second half of the term.

When working on these activities, please work as a *team*. Your Team will turn in a single write-up write-up. The Record-Keeper is officially in charge of making sure it is complete, but all members should contribute equally.

For each Practical session members of each Team should serve the following roles:

- **Facilitator.** This person, *a different individual each week*, is responsible for keeping the Team on track with the Activities. When the entire Practical group discusses some topic, the Facilitator will be the Team’s primary spokesperson.
- **Record-Keeper.** This person, also *a different individual each week*, takes primary responsibility for recording all answers in the write-up that will be marked.
- **Time-Keeper.** [optional] This person, also *a different individual each week*, should keep an eye on the time and make sure the team is not getting behind.
- **Computer/Wiki-master.** [optional] This person, also *a different individual each week*, takes primary responsibility for any online research or computer activities.

Activity 1.1 – The Electromagnetic Spectrum

Please order the following forms of electromagnetic radiation from shortest to longest wavelength, and, for each, list:

Column 1: name

Column 2: Typical wavelength

Column 3: Typical photon energy

Column 4: Brief mention of one or two applications, properties or concerns.

- Gamma Rays
- Infrared Radiation
- Microwaves
- Radio Waves
- Ultraviolet
- X-rays
- Visible Light [Note, this is 4th in the list of 7 ordered in increasing wavelength, and this has been filled into the table for you as an example of what we are looking for – please be brief!]

Name	Typical Wavelength	Typical Photon Energy	Applications, Properties or Concerns?
<i>Visible Light</i>	<i>500 nm</i>	<i>1 eV</i>	<i>humans can see it, and the different wavelengths look like a rainbow</i>

Activity 1.2 – Is it a wave?

Hecht Problem 2.31. [Note: ask yourself: “Do these solve the differential wave equation?” - if you are stuck, the answer is in the back of the book!]

Activity 1.4 – Identifying Items in the Introductory Optics Kit

You have a box called an “Introductory Optics Kit” from PASCO. It has a number of items in it, which are pictured in the drawings on the next 2 pages. Each drawing has a letter. Please fill in the correct letter beside the name in the table below

Name of component or components in drawing	Letter
Color Filters ($\times 3$): Red, Green and Blue/Green	
Component Holders ($\times 3$)	
Crossed Arrow Target	
Cylindrical Lens	
Diffraction Grating	
Diffraction Plate	
Diffraction Scale	
Incandescent Light Source	
Lenses ($\times 3$): 75, 150 and -150 mm focal lengths, Spherical Mirror: 50 mm focal length	
Optics Bench	
Parallel Ray Lens	
Polarizers ($\times 2$)	
Ray Optics Mirror	
Ray Table	
Ray Table Base	
Ray Table Component Holder	
Slit Mask (with one rectangular opening)	
Slit Plate (with multiple slits)	
Variable Aperture	
Viewing Screen	
Virtual Image Locators ($\times 2$)	



