Wednesday, June 7, 2023

Optics

12:15 to 12:30 Lasers and Laser Pointer Safety Adriana

12:30 to 1:00 The wave nature of light Laurie

 Ask “What is light?” (Energy – ability to do work – what is work, move stuff heat &

push around)

Demo with Crooke’s Radiometer

Show video of solar car

 Particle vs wave

 Definitions, wavelength, constructive/destructive interference

 Hubert’s strips

Online ‘Ripple Tank’

EM chart

measure UV and IR with the laser meter and rainbow

 What part of the chart do you work with?

 Interference patterns – laser with diffraction grating

 Demo Interference pattern – cloth (Priscila Rosa did the hair measurement Tuesday)

1:00 to 1:30 Taking Light Apart and Putting it Back Together Laurie

 Discuss rainbows – demo with glass of water

 Make rainbows with triangular prism, collimator, and flashlight

 Make rainbows with diffraction grating and flashlight

 Demo how different colors bend differently (with lasers) time???

 Combine colors and make white with colored flashlights

 Talk about absorption of light

Also use colored flashlights with prisms

 Discuss the Dress

 “Step into the Rainbow” while playing with prisms

1:30 to 1:45 Break

1:45 to 2:15 Reflection and Refraction and Absorption and Scattering

 Demo reflection/refraction with laser refraction tank Laurie or someone?

 Total Internal Reflection (light guides, waterfall) Hubert

 Introduce 5-laser/prism boxes, look at focal length, etc.

 Index of Refraction

 Grow spheres in water Laurie

Snell’s Law calculation Hubert

 Laser Microscope with dirty water Laurie

 Sky is blue tank (get the eggs) Laurie

2:15 to 2:45 Spectroscopy

 Infrared and UV examples

 Demo with IR/iPhone camera, UV

 Look at Various objects with UV lights

 RSpec Explorer with gas tubes and light tower

 Show spectroscope examples

 Use the spectroscopes they made as Tuesday night’s homework

 Fluorescence and phosphorescence demos

 Invisible ink pens and phosphorescent paper, write with blue laser