

Optics Curriculum Outline for Upper Elementary

v.1 – 2008

What is light?

Form of energy - ex: black object absorbing light and converting into heat energy

ex: photocell making electricity

Light energy from the sun is needed for plants to grow

Properties of light

Very fast 300,000 km/sec - takes two seconds to go to the moon and back

Vibrating waves: slower vibrations red, faster violet - *connection to sound/pitch*

Color spectrum - ROYGBIV

Sunlight is a mixture of colors

Gravity can bend light – *connection to space science*

Observing light

Exploration Toolkit

transmittance – how much light will pass through an object

reflection – rule of incidence using mirrors

focusing – convergence and divergence using lenses

diffraction – spreading light out into its spectrum using prism or grating

polarizing – filtering out jumbled up lightwaves

Using light as a tool for science

Measure speeds of stars/galaxies in the universe - Doppler effect

Telescope

Microscope

Fiber optic communication

Lasers

Light as an energy source

Photoelectric cells

Mirror furnaces

Grow plants --- carbon source

Collecting heat from black surfaces

Fun with light

Laser maze

Flashlight tag

Light show – special effects

Strobes