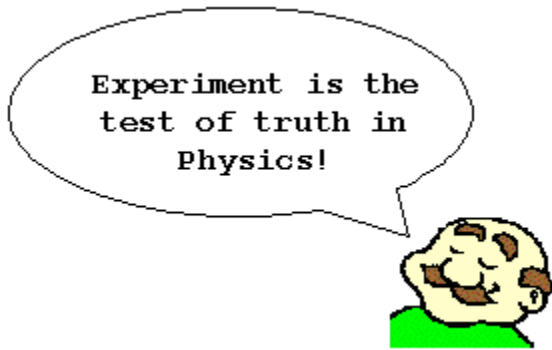


- **C.E. Physics 1010 Outline & Lesson Plans**

Quarter #2



Day #22:

C: Ohm's Law I

E: Ohm, Sweet Ohm: What is the relationship between current and voltage for the electronic device known as a resistor? (2 resistors, alligator clip wires, power supply, current apparatus, multimeter, graph paper & switch)

H: Circuit Diagram W.S.

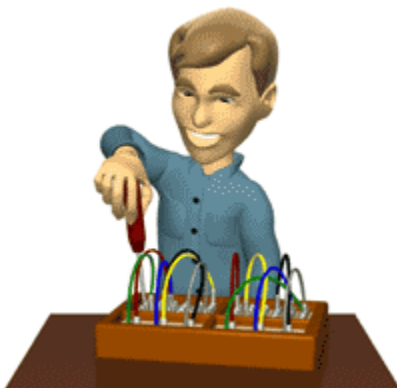
Day #23:

C: Ohm's Law II

E: Ohm Run!: Two common electric devices are incandescent light bulbs and LEDs. Does Ohm's law apply to both of them? (incandescent lamp, light-emitting diodes, alligator clip wires, power supply, circuit apparatus, multimeter, and graph paper)

T: E-field & Coulomb's Law test

H: Ohm's Law W.S.



Day #24:

C: Ohm's Law III

E: There's No Place Like Ohm For the Holidays: Are mini holiday lights ohmic conductors? (Various mini holiday light bulbs, alligator clip wires, power supply, circuit apparatus, multimeter, switch, and graph paper)

H: Textbook: Ohm's Law assign.

D: Resistance Board

Day #25:

C: Capacitors

E: Energy in a Sandwich: What is a capacitor, and how does it store energy? (Power supply, two 2.5 V light bulbs & sockets, one 5000 microfarad capacitor, one 25000 microfarad capacitor, electrical wire, magnetic compass, switch)

T: Ohm's Law

H: Capacitor W.S.

Day #26

C: Light Introduction I

E: The Light and the Dark of It: What effect does the distance from an object have on the area of the object's shadow? (Maglite, small cardboard sheet, meter stick)

D: Light emitted classification with various objects

H: Electrical Power W.S.

Day #27

C: Light Introduction II

E: You Light Up My Life: What effect does the distance from a light source have on the brightness created by that source? (CBL light intensity probe, clearlight bulb, maglight and meter stick)

H: Textbook: Read Light Chapter & do R.Q.

D: Light efficiency (Bulb Brightness vs. Wattage)

Day #28

C: Wave Parts and Characteristics

E: Mechanical Snake: What are the characteristics of transverse and longitudinal wave in strings and springs? (Two large empty cans, 30 m of string, two short metal rods, slinky, heavy metal spring, chalk, stopwatch, & meter stick)

H: Textbook: Read Wave and Vibration Chapter, Do the R.Q.

D: Fast Times At Frequency High: Computer with sound analysis software



Day #29

C: Wave transmission, reflection, & interference

D: Water table overhead

D: Chladni Plate

D: Smoke Rings

D: Wave Tank

V: Mechanical Waves

P: Assign. Musical Instr. proposal

T: Light Properties

H: Wave & Vibration W.S.

Day #30

C: Speed of Sound

E: "Fore!" Golf and the Speed of Sound: How can you determine the speed of sound using the principle of resonance? (Resonance tube about 60 cm long, 1000 ml graduated cylinder, meter stick, tuning forks (256 Hz or higher)).

V: Sports of baseball.

D: Drum, stopwatch and trundle wheel

Day #31

C: Doppler Effect

D: Can You Carry a Tune On a Bike? How can you use the Doppler effect to calculate the speed of a vehicle? (Harmonica, glockenspiel, car & portable tape player)

E: How Fast Do You Reflect? (CBL, microphone, long hollow tube)

D: Watch that Wave Slide by: How can you use an oscilloscope to find the speed of sound?

H: Textbook: Read Sound Chapter and do T.E.

D: Doppler Spin

V: Dukes of Hazard

Day 32:

C: Sound Interference: Beats, standing waves & resonance

E: Good Vibrations: What sounds can be produced by vibrating objects? In what ways can those sounds be changed? (Tuning fork, shallow dish of water, soft drink bottle, spoon, plastic drinking straw, scissors, blade of grass, simple pendulum, chalk, chalkboard, meter stick, masking tape)

D: Frequency profile of a stadium horn

D: Smoke Rings

D: Flame tube

D: Resonance Box

V: Tacoma Narrows Bridge

D: Big Tuning Forks: Beats

D: Sound cassette tape

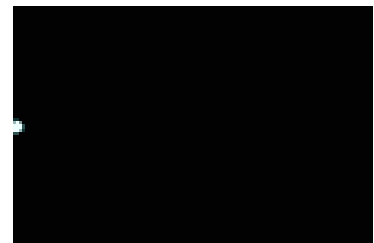
H: Sound W.S.

Day 33:

C: Timbre & Overtones

D: Whirly tubes

E: Boomwhackers: How can you make music with a plastic pipe? What are the factors that affect frequency (pitch) of music



from the pipe?

D: Audio Cassette

T: Wave & Vibration

H: Musical Instr. W.S.

P: Musical Instr. Proposal Due

Day 34:

C: Musical Instruments

E: Strings and Drums and Xylophones, OH My!: What are the factors that affect frequency (pitch) of simple musical instruments? (Xylophone, monofilament string, drums, meter stick, frequency meter to analyze frequency)

D: And The Band Played On: The art of musical instr. (Trumpet, trombone, flute, piccolo, clarinet, and other wind instruments; meter stick)

E: Audio Cassette

Day #35:

C: Reflection

H: Reflection W.S.

T: Sound

E: Images, Images, Images: How does reflected light travel to the eyes? (2 plane mirrors, supports for the mirrors, 2 single-hole stoppers, 4 identical drinking straws).

D: Superman



Day #36:

C: Plane Mirror

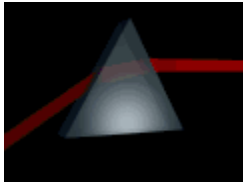
E: Don't Shatter My Image: How does the size of the angle at which a ray of light hits a plane mirror compare to the size of the angle at which the light is reflected? (Cardboard sheet, plane mirror, mirror supports, straight pins, protractor, meter stick, tape)

D: 3 ft mirror

H: Reflection W.S.

D: Mirage Slides

D: Large Concave & Convex Mirrors



Day 37

C: Refraction

E: Slow Down and Bend Around: What happens to light as it passes from one transparent medium (air) into another (water)? (Zippered sandwich bags, pencils, small plastic capsules with toys, 250 ml beaker, laser)

D: Aquarium refraction

H: Textbook: Reflection & Refraction Chapter, do R.Q.

Day 38:

P: Musical Instr. Concert

T: Reflection & Refraction

E: Concave Mirror: How does varying distances of the object affect the image size, orientation and location?
(Small mirrors, 2 meter sticks, rulers, AC light source, paper)



Day #39

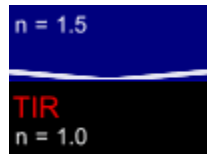
C: Snell's Law

E: Slower Than a Snell: What are the characteristics of refraction that allow us to make predictions? (Semi-Circular Refraction dish, polar graph paper, pins, cardboard & light source)

D: Smoked Prisms

D: Prism rainbows

H: Refraction W.S.



Day #40

C: Pinhole diffraction

D: Peeking Through a Pinhole: How can an image be formed through a pinhole?

E: Similar What? How can you predict the size of an image formed through a pinhole? (Clamp lamp, 40 W unfrosted bulb, pinhole telescope, converging lense).

D: Going to the Sun: How far away is the Sun?

D: Black Hat

H: Snell's Law W.S.

Day #41

C: Lenses I

E: Where's The Point: What path does light take through lenses to produce

images? (Laser, two triangular shaped pieces of glass, white screen, assorted convex & concave lenses, one-holed rubber stopper, meter stick)

H: Textbook: Read lense chapter and do the T.E.

V: Mechanical Universe: Optics

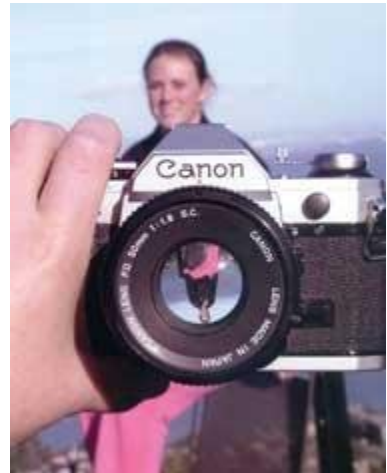
T: Reflection & Refraction

P: Assign polarized slide w/ cellophane tape

Day #42:

C: Lenses II

E: Here's the Point: What is the relationship between the image and object distance when an image is formed as a result of light passing through the lens? How can you predict the magnification of an image? (Light source, white screen, convex & concave lenses, 2 meter sticks, black construction paper, graphing calculator)



E: Negative Lens: How can the focal length of a diverging lens be measured? (Laser, concave lens, 2 depression microscope slides, index card, graph paper)

H: Lense W.S.

D: Telescope

V: Mechanical Universe: The wavelength of Light

Day #43

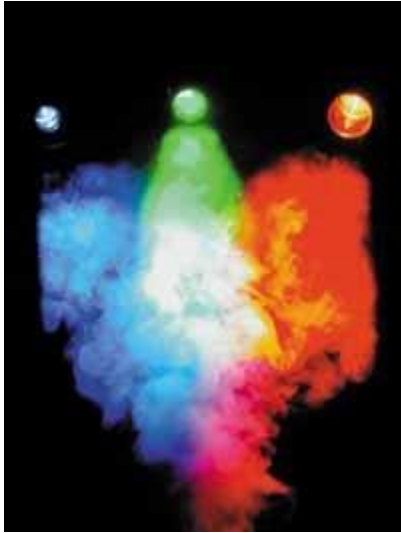
C: Diffraction & Interference

E: Bending Sound & Light: How can you use common objects to observe the diffraction of sound and light? (9V battery, 2 piezo buzzers with supports, paper, marker, straight edge, light source, soap solution, wire frame for soap film, flat glass plates, prism, diffraction grating)

D: Two in-phase speaker

D: Diffraction grating/laser

H: Textbook: Read Diffraction/Interference chapter & do R.Q.



Day #44:

C: Color

E: Color By Number: How does the process of color mixing of light compare with the color mixing of printing and painting? (Clear incandescent bulb, clamp lamp, white screen, colored filters (red, green, blue, yellow, orange, magenta) & colored pencils)

D: Color My World, (3 colored lamps)

D: Light box

T: Lense

H: Textbook: Read Color Chapter & do R.Q.

Day #45

C: Polarized Light

D: Shady Business: Iceland spar-calcite crystal & polarizing filters

E: Let's Reflect On That: In what ways does a surface's ability to reflect light affect it's polarity? (Plane mirror, glass plate, shiny surface, light source, polarizing filter, water)

D: To Be or Not to Be Polarized:

P: Polarized Slide Concert