

# LIGHT, COLOUR AND THE EYE

## UNIT OVERVIEW

In this illuminating science unit, students discover the exciting topic of light and the human eye. The unit employs student overhead notes to convey much of the knowledge-based material of the unit combined with exciting student activities which relate to the topic of each lesson. The two parts, “Light and Colour” and “The Human Eye” can be taught separately or together.

## LESSON TOPICS AND STUDENT ASSIGNMENTS

### PART I - LIGHT AND COLOUR

1. **Light - Introduction** - Students are introduced to the topic learning about luminous and illuminated objects then complete questions and a “Word Search”.
2. **Properties of Light** - Students learn about transparent, translucent and opaque objects and investigate light's property of travelling in straight lines with the activity “Building a Working Sundial”.
3. **White Light and the Spectrum** - Students use prisms to “break” white light into the colours of the rainbow (the spectrum) in the activity “Breaking Up Is Hard To Do”.
4. **Reflection - Mirror Images** - Students investigate mirror images in the hilarious activity “The Amazing Mirror Hockey Shootout”.
5. **Reflection - Measuring Angles** - Students study the law of reflection and compare incident and reflected rays by measuring in the experiment “Measuring Reflection”.
6. **Refraction** - Students examine refraction and the bending of light by making a Babyfood Jar Magnifying Glass. The worksheet is “Refraction and Bending Light”.
7. **Colour and Pigments** - In this optional lesson, students learn the difficult concepts relating to colour and complete the colour absorption worksheet “Blinded By The Light”.

### PART II - THE HUMAN EYE

1. **The Human Eye** - Students learn about the parts of the human eye, experiment with pupil size and find their blind spot. The worksheets are “Pupil's Pupils”, “Make Your Homework Disappear” and “Crossword Puzzle”.
2. **Optical Illusions** - Students examine many classic optical illusions including the perplexing “Old Woman/Young Woman” illusion.

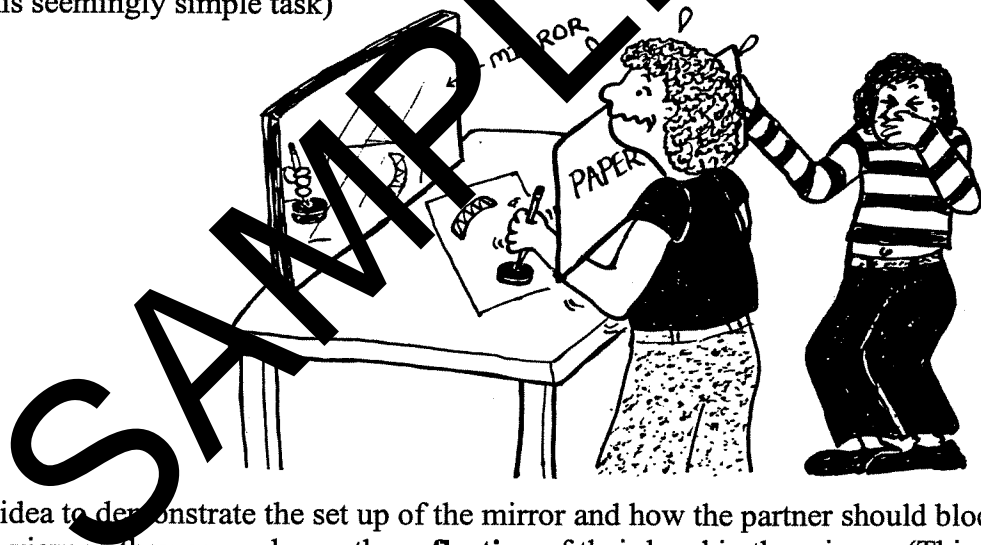
## LESSON #4 - REFLECTION - Mirror Images (1 Class)

### Student Objectives, Activities and Assignments

- Students, in groups of two or three, investigate reflection and mirror images. Students complete the worksheet “**The Amazing Mirror Hockey Shootout**” as they try to send a hockey puck into an empty net using a mirror and pen.

### Suggested Teaching Strategies

- Large (9 X 12 inch), flat mirrors are best even though smaller mirrors will do.
- Hand out the worksheet and read through the instructions.
- In the first section, students put their pencils on the puck and then try to score on the goal by drawing a diagonal line to the net. This task would be easy, except a partner covers the drawer's hand with a sheet of paper so the drawer can only look at the reflection of their hand in the mirror. (This activity is hilarious to super-visual students struggle to complete this seemingly simple task)



- It is a good idea to demonstrate the set up of the mirror and how the partner should block the drawer's view so they can only see the **reflection** of their hand in the mirror. (This is not really as complicated as it sounds)
- The second section involves students tracing over the words “**CAT**” and “**DOG**”, again seeing only the reflected image.
- In the third activity, students print their name so that it looks right in the mirror.
- Students may run out of time before completing the entire worksheet, but the point of this fun activity is to show students how a reflected image in a mirror is reversed compared to the real thing.
- Students write down corresponding notes on “Reflection”.

## LIGHT, COLOUR AND THE EYE REVIEW

Name: \_\_\_\_\_

### Match

- a) a guy that helps remember the colours of the spectrum      \_\_\_ luminous
- b) a black hole in the center of the eye      \_\_\_ illuminated
- c) an object that makes its own light      \_\_\_ translucent
- d) a see-through object (plexiglass)      \_\_\_ transparent
- e) an object that you can only see through a little bit (wax paper)      \_\_\_ opaque
- f) an object that you cannot see through (wood)      \_\_\_ prism
- g) muscles that let the proper amount of light into the eye      \_\_\_ spectrum
- h) used to break white light into the colours of the spectrum      \_\_\_ ROY G. BIV
- i) light sensitive cells that see colour and are used in the day      \_\_\_ reflection
- j) the name for the colours of the rainbow      \_\_\_ refraction
- k) when an object is lit up by another object      \_\_\_ blind spot
- l) "screen" at the back of the eye      \_\_\_ rainbow
- m) what happens when light hits a mirror and turns a corner      \_\_\_ cornea
- n) carries messages from the eye to the brain      \_\_\_ pupil
- o) light sensitive cells that see light and dark      \_\_\_ iris
- p) a part of a magnifying glass, a telescope and an eye      \_\_\_ retina
- q) this part of the eye has no rods or cones and "can't see"      \_\_\_ lens
- r) refraction of sunlight causes this after a rainstorm      \_\_\_ rods
- s) protective covering for the eye      \_\_\_ cones
- t) when light is "bent" going from one material to another      \_\_\_ optic nerve

## The Eye

Light passes through the protective cornea and enters the eye through the pupil. The iris is a set of muscles that controls the size of the pupil and how much light to let in. Then, light goes through the lens which bends the light and focuses it upside-down on the retina which acts like a screen. Special cells on the retina called rods and cones send out signals when they are hit by light. These signals are sent from the eye to the brain along the optic nerve. Every eye has a blind spot where the optic nerve connects to the retina. This happens because there are no rods or cones where the optic nerve joins to the retina.

