# FIFTH AND SIXTH - LIGHT

**Teacher Guidelines:**

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**Linkage:**

- Materials - Properties & Characteristics of Materials
- Energy & Forces – Electricity, Heat
- Living Things – Human Life
- Environmental awareness and care

**Integration:**

- Oral Language Development – English and Irish
- Geography – Planet Earth in Space
- History

**Content Objective:**

**LEARN THAT LIGHT IS A FORM OF ENERGY.**

**Some suggested activities:**

- Make a pizza box solar oven
- Place some water in a container and record the temperature of the water.
- Place the container in sunlight and record any changes in temperature over a period of time. Ask the children to predict what they think will happen and ask them to record any changes which occur.

**Some suggested investigations:**

- Does the size or shape of the container affect the temperature of the water?
- Does the material the container is made from affect the temperature of the water?
- Does the colour of the container affect the temperature of the water?

**Some suggested design and make:**

- A cover for a bottle of cold drink to help it stay cold out in the sun.

**Content Objective:**

**KNOW THAT LIGHT TRAVELS FROM A SOURCE.**

**Some suggested activities:**

- Discuss different sources of light and their uses.
- Distinguish between artificial and natural sources of light.
- Introduce the children to the notion that light travels in straight lines. Discuss what beams of sunlight through clouds look like. Cover the end of a torch with a piece of kitchen foil and make a small hole with a pencil. Shine the torch in a darkened room and observe the way that the beam of light travels. Place 3 cards, with holes in the same position on them, in a line and shine a torch through the 3 cards. See what happens when one card is moved out of line.
- Reflect the light off a mirror. How does the light travel?

**Content Objective:**

**INVESTIGATE THE SPLITTING AND MIXING OF LIGHT**

*Use prism to create spectrum*

*Mix coloured light using filters*

**Some suggested activities:**

- Revise splitting of light as for 3rd and 4th classes
- Hold light paddles in front of a light source. Record the colour combinations observed.
- Place a piece of red, green and blue plastic filters (or use light paddles) over 3 separate torches and shine onto white paper. Observe and record the colour combinations.
- Look at coloured objects through coloured filters or light paddles.
- Mix light: Draw a circle and divide it into seven sections and colour in each section with a colour of the rainbow. Spin the circle very fast using a pencil, piece of string or a motor connected to a battery. Ask the children to discuss and record what they see.
- Make a rainbow by placing tumbler of water on window sill when sun is shining brightly. Place large sheet of white paper/card on floor to “catch” rainbow

**Content Objective:**

**INVESTIGATE THE REFRACTION OF LIGHT**

**Some suggested activities:**

- Place a drinking straw at an angle in a jar and ¾ fill the jar with water. Ask the children to observe and draw what they see.
- Discuss with the children what objects on the bottom of the swimming pool look like and

why they think this is so

- Try the appearing coin trick: Place a coin in an empty spread container where you can see it. Move slowly back until the coin is just out of your line of vision and hold your position. Ask a partner to slowly pour some water into the container from a jug and watch what happens.
- Observe a narrow beam of light travelling through a slit in a box and travelling through a jar of water.

**Content Objective:**

**INVESTIGATE HOW MIRRORS AND OTHER SHINY SURFACES ARE GOOD REFLECTORS OF LIGHT**

*Effects of flat shiny surface, curved shiny surface*

**Some suggested activities:**

- Use mirrors to see around corners, under desks, over obstructions.
- Bounce light onto a given target using 1,2,3 or 4 mirrors.
- Compare images in flat, concave and convex mirrors.

**Some suggested investigations:**

- Can you use 4 mirrors to make light appear to travel through a cardboard or Lego wall?

**Some suggested design and make:**

- Design and make a periscope

**Content Objective:**

**EXPLORE HOW OBJECTS MAY BE MAGNIFIED USING SIMPLE LENS OR MAGNIFIER.**

*Investigate use of lens; design and make model telescopes*

**Some suggested activities:**

- What everyday objects use lenses (e.g. Camera, telescope, binoculars, spectacles, magnifying glasses, microscopes etc.)? Why do these objects contain lenses? What do the lenses in them do? How do you think they work?
- Explore how magnifiers work using a selection of available magnifying glasses, old lenses from disposable cameras, spectacles etc. What are the lenses made from? Compare the magnifying power of the various lenses. What effect does moving the lens have? Predict and discuss.
- Are all the lenses the same? Describe the shape of the lens. Is it curved in or curved out? Introduce the children to convex (curves out) and concave (curves in)

lenses. Which lens would you use to magnify an object? Which lens makes the object smaller?

- Which types of lenses are used in the spectacles owned by children in the class? What does this tell us about their eyesight? Which lens would you use if you were short/long sighted?
- Observe objects through jars of water with flat and curved surfaces. Note differences
- Make magnifier using drop of water on a strip of sticky tape.
- Shine a torch through convex and concave lenses onto a wall or screen. What happens to the beam?
- Place a small object between a torch and a lens. Move the lens to focus the image on a screen or wall.

**Some suggested design and make:**

- Design a make a telescope.
- Make a magnifier (e.g. using a drop of water on a strip of sticky tape, a clear marble, a jar of water).

**Content Objective:**

**APPRECIATE THE IMPORTANCE OF SIGHT**

**Some suggested activities:**

- Children use a stopwatch to time each other stacking unifix cubes/blocks with eyes open and then closed. Which way is more efficient? Why?
- Children attempt to identify coins by touch.
- Children attempt to identify other children by touch and voice.
- Use mirrors to observe external parts of the eye and discuss their function.
- Children shine a dim torch into their partner's eye and observe the effects on the eye pupil.
- Demonstrate how the eye works: Cover the opening of a glass transparent bowl with black paper and secure it in position. Make a small hole in the middle of the black paper with a pencil, point the covered end of the bowl at a TV and the uncovered bottom of the bowl at a piece of white paper/card. Turn off the lights and observe what you see.
- Observing images using a pinhole camera. Understand vision and the image on the retina through the pinhole in the eye; the brain reverses the upside-down image
- Find examples of optical illusions in puzzle books, on the internet etc. Ask the children to see if they can create their own.

**Some suggested investigations:**

- Which eye do we see best with?
- Find your dominant eye – look at object in the distance (with both eyes open) through ring made with thumb and index finger held at arms length; close right eye, is the object still seen through the ring? If so your left eye is dominant eye.
- Find your blind spot.
- See the hole in your hand! Use core from silver foil; hold tube/core up to left eye; with both eyes open look at something in the distance; put right hand beside the tube. Can you see the hole in your hand?

**Some suggested design and make:**

- Pinhole camera
- Model of Camera/eye. Remove top of 500ml milk carton and cover with greaseproof paper. This acts as the retina or film plate. Make hole in end of carton and insert cardboard tube. This is the pupil or aperture of camera. Place lens in front of "pupil" and observe upside-down image on "retina"
- Make a movie! Draw animated pictures on the edge of a copybook. Flick the pages quickly and watch how they move!

**Content Objective:**

**UNDERSTAND THE ROLE OF SUNLIGHT IN PHOTOSYNTHESIS AND APPRECIATE THAT THE SUN GIVES US HEAT AND LIGHT WITHOUT WHICH WE COULD NOT SURVIVE.**

**Some suggested activities:**

- Cover strips of houseplant leaves with kitchen foil. Compare what happens to uncovered strips of leaves
- Discuss the importance of the sun for life

**Some suggested investigations:**

- What will happen to pot plants placed in complete darkness?
- What will happen to pot plants placed in a fridge/freezer

Primary Professional Development Service

**Content Objective:**

**BE AWARE OF THE DANGERS OF EXCESSIVE SUNLIGHT**

*Dangers of looking directly at the sun*

*Effect of the sun's rays on skin*

*Design and make a sun canopy or umbrella for toys as dolls and models*

**Some suggested activities:**

- Discussion of dangers of excessive exposure to sun light and how we can protect ourselves

**Some suggested design and make:**

- A sun canopy, umbrella or beach lounger