

SANGAM SKM COLLEGE NADI

LESSON NOTES

WEEK 1

BASIC SCIENCE

YEAR 10

Strand 3	ENERGY
Sub strand	3.1 ENERGY SOURCE AND TRANSFER
Content Learning Outcome	Investigate the behavior of light passing through lenses and prisms and relate this to their uses and how they are cared.

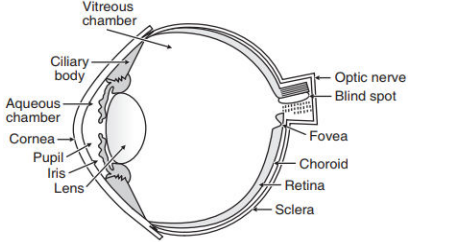

3.1.1 BEHAVIOR OF LIGHT ON LENSES AND PRISMS



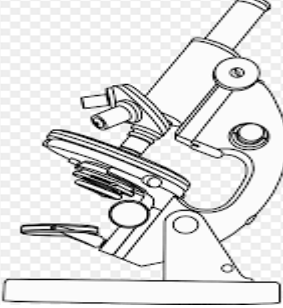

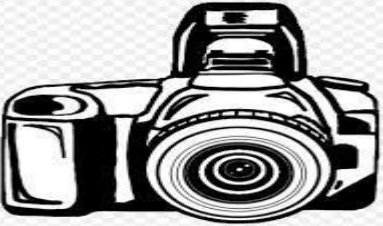

- Source of light is the sun.
- Light makes us see things as it is the form of energy that is detect with eyes.
- Light that reach the earth is only in small part of the energy from the sun.

Lenses

- Lens is a transparent optical device used to converge or diverge transmitted light and to form Images.

Many materials contain lenses and a few examples are shown below.

Object	Image	Object	Image
Eyes		Eye glasses	 <p style="text-align: center; font-size: small;">shutterstock.com · 174630569</p>

Telescope		Hand lens	
Microscope		Binocular	
Camera		Projector	

Activity: Multiple Choice.

Circle the correct answer.

- What is the lens?
 - An image – forming device
 - An image – producing device
 - An image – reflecting device
 - An object – reflecting device
- The spherical surface of lens results in _____
 - having a wide range of focal length.
 - having a narrow range of focal length
 - having a wide range of curvature
 - having a narrow range of curvature

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LESSON NOTES-WEEK 2

BASIC SCIENCE

YEAR 10

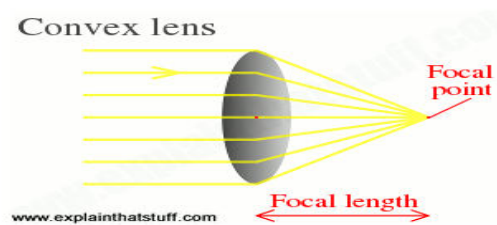
Strand 3	ENERGY
Sub strand	3.1 ENERGY SOURCE AND TRANSFER
Content Learning Outcome	<i>S10.3.1.1</i> Investigate the behavior of light passing through lenses and prisms and relate this to their uses and how they are cared.
Achievement Indicator	<ul style="list-style-type: none"> Use ray diagrams to show the path of light when passing through lenses and prisms.

Lens Types

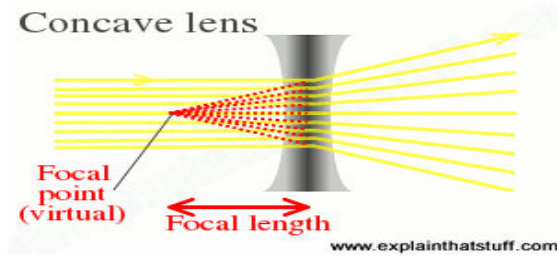
There are two types of lens. They can either be a converging (convex lens) or diverging (concave lens).

Convex lenses

- In a **convex lens** (sometimes called a positive lens), the glass (or plastic) surfaces bulge outwards in the center giving the classic lentil-like shape.
- A convex lens is also called a converging lens because it makes parallel light rays passing through it bend inward and meet (converge) at a spot just beyond the lens known as the **focal point**.

**Concave lenses**

- A **concave lens** is exactly the opposite with the outer surfaces curving inward, so it makes parallel light rays curve outward or diverge.
- That's why concave lenses are sometimes called diverging lenses. (One easy way to remember the difference between concave and convex lenses is to think of *concave* lenses *caving* inwards.)



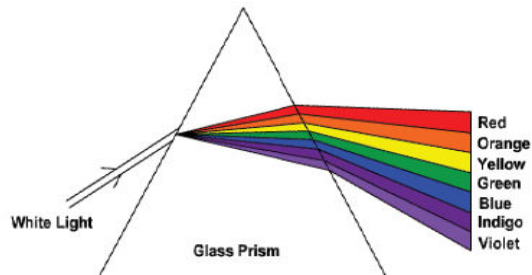
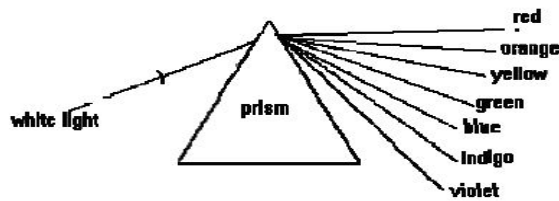
Rays

- Light is an electromagnetic wave and the straight line paths followed by narrow beams of light, along which light energy travels, are called rays.

Dispersion of Light

- The light rays from the sun consist of seven different colors – red, orange, yellow, green, blue, indigo and violet (ROYGBIV).
- If a ray of light passes through a prism as in the diagram, the light splits into a range of colours. The effect is called dispersion and the colour range is known as a spectrum.

Ray diagram through a prism



- The most familiar example of dispersion is a rainbow which is seen when the sun appears in the sky after the rains.
- The moisture in the atmosphere behaves like tiny prisms, dispersing the sun's rays into seven colors.
- This shows that white light is not one colour but a mixture of colours. It also shows that rays of different colours are refracted (bent) by different amounts.

EXERCISES

1. Define the term ray?
2. Refer to the prism ray diagram to answer questions (i) and (ii).
 - (i) Which colour does a prism refract (bend) the most?
 - (ii) Which colour does a prism refract the least?

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LESSON NOTES-WEEK 3

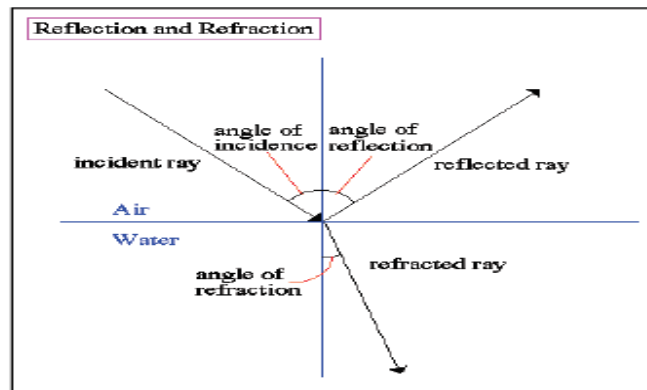
BASIC SCIENCE

YEAR 10

Strand 3	ENERGY
Sub strand	3.1 ENERGY SOURCE AND TRANSFER
Content Learning Outcome	<i>S10.3.1.1</i> Investigate the behavior of light passing through lenses and prisms and relate this to their uses and how they are cared.
Achievement Indicator	<ul style="list-style-type: none"> Identify the incident ray, normal, refracted ray, angle of incidence, angle of reflection.

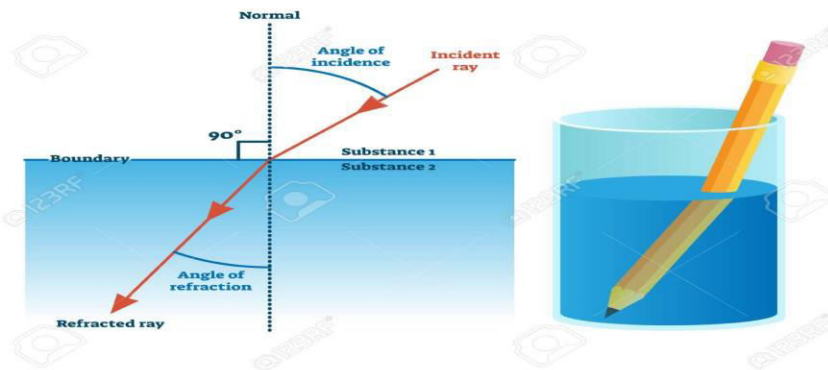
Refraction

- Refraction** is the bending of **light** (it also happens with sound, water and other waves) as it passes from one transparent substance into another.
- This bending by **refraction** makes it possible for us to have lenses, magnifying glasses, prisms and rainbows. Even our eyes depend upon this bending of **light**.

*Example*

- When a ray of light enters a glass block, it bends towards the normal [fast medium to slow medium] and as it leaves the glass block, it bends away from the normal [slow medium to fast medium].
- The bending of light can also give you a false impression about depth.

REFRACTION



Other Examples of Refraction

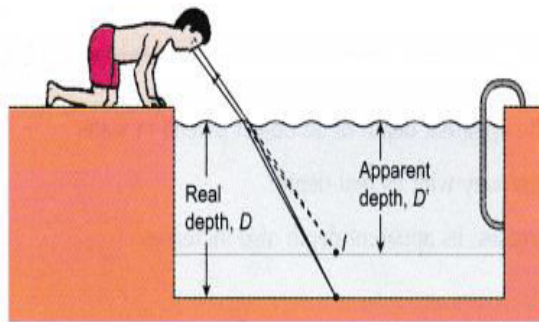
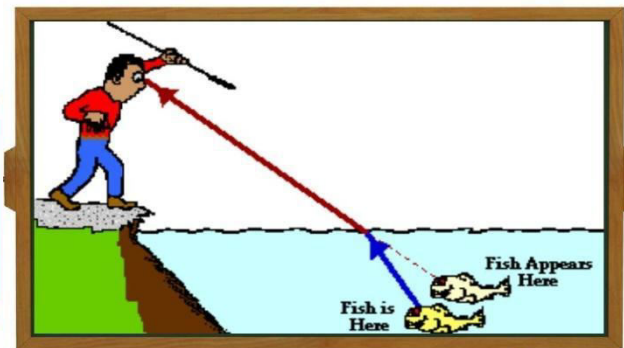


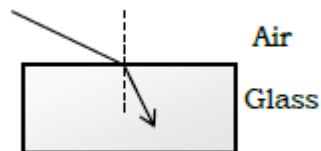
Figure Apparent depth and real depth



Visualize

EXERCISES

- The diagram given below shows a light ray bending towards the normal as it travels from air to glass. This phenomenon is best known as _____.



- The angle of reflection in the diagram given below is _____.

