Experiment: 7

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Semester: 8th
Date of Performance: April 7th
Subject Name: AR Lab
Subject Code: CSF- 484

1. Aim/Overview of the practical:

Light propagation and properties; Lenses; Diopters

2. Task to be done:

Discuss the light propagation and properties, lenses, and diopters in detail. In Addition, implement as well as write down the steps to perform the experiment based on light properties.

3. Theory:

Light Propagation:
Propagation of light refers to the manner in which an electromagnetic wave transfer it's energy from one point to another. Three main processes generally occur when light passes between boundaries from one medium to another:

- Transmission
- Reflection
- Refraction

Transmission: Transmission of light, where light waves pass through a material without absorption, is affected by thickness, and type of material.Transmission of light is the moving of electromagnetic waves (whether visible light, radio waves, ultraviolet, etc.) through a material. This transmission can be reduced, or stopped, when light is reflected off the surface or absorbed by the molecules in the material.

Reflection: When a ray of light falls on any object (polished, smooth, shiny object), light from that object bounces back those rays of light to our eyes and this is known as “Reflection” or “Reflection of Light”. This phenomenon is what enables us to look at the world around us based.

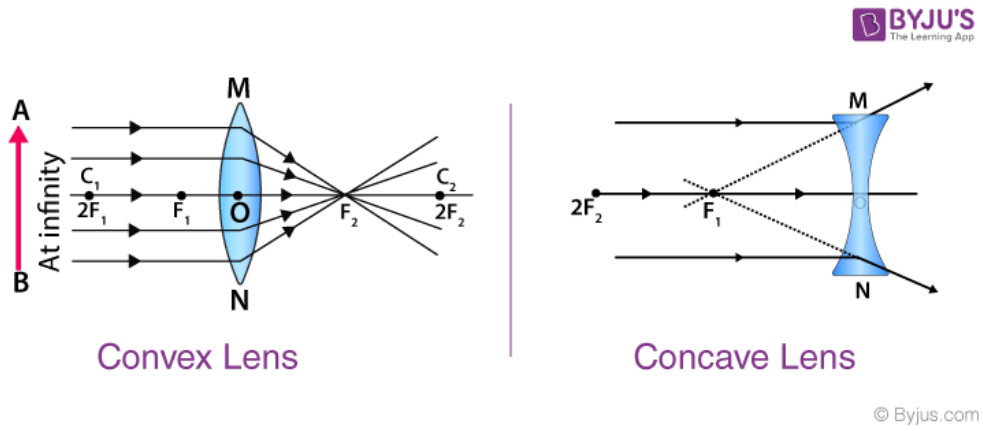
Refraction: Refraction is the bending of light (it also happens with sound, water and other waves) as it passes from one transparent substance into another. This bending by refraction makes it possible for us to have lenses, magnifying glasses, prisms and rainbows.

Lenses:

Lenses are made from polished surfaces that act as mirrors, lenses bend rays of light so that a focused image is formed. Over the past, it is being used in manufacturing of several devices such as telescopes, magnifying glasses, binoculars, cameras, and microscopes.

There are mainly two types of lenses:

1. Concave Lens
2. Convex Lens

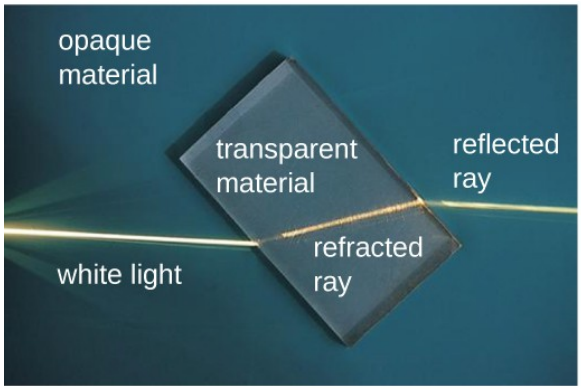


Diopter:

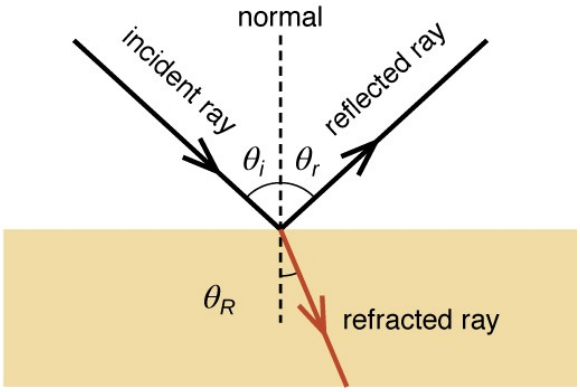
It is a unit of measurement with dimension of reciprocal length, equivalent to one reciprocal metre, 1 dioptre = 1 m−1. It is normally used to express the optical power of a lens or curved mirror, which is a physical quantity equal to the reciprocal of the focal length, expressed in metres.

The dioptre can also be used as a measurement of curvature equal to the reciprocal of the radius measured in metres.

Experiments based on Properties of light:



(a)



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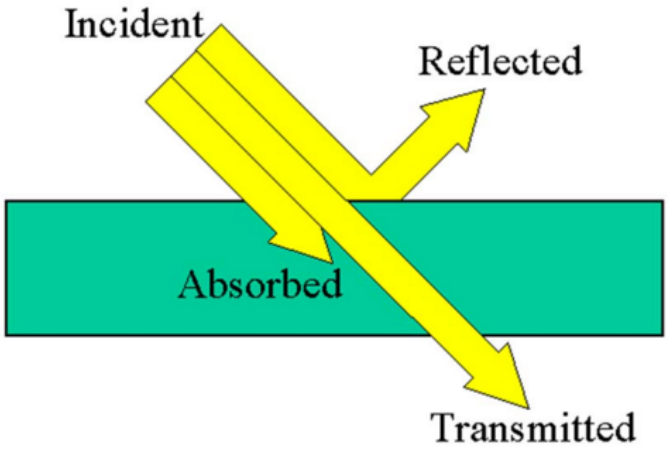
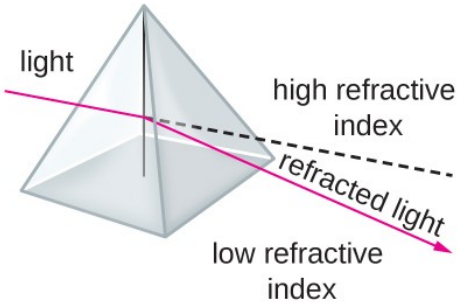
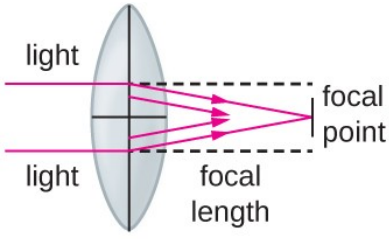




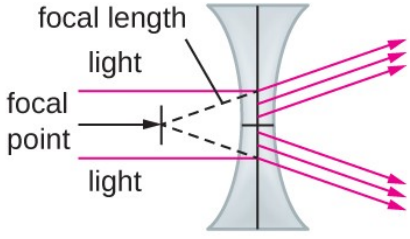
Prism

(a)



Convex lens

(b)



Concave lens

(c)