CLASS: VII **SUBJECT: SCIENCE**

CHAPTER -15 LIGHT
MODULE -3/3

LENSES

- **Lenses are transparent and light can pass through them .**
- **A magnifying glass which is used to read very small print or to observe the body parts of a cockroach or an earthworm. Magnifying lens is actually a type of lens.**
- **Lenses are widely used in spectacles ,telescopes and microscopes**

TYPES OF LENSES

1.CONVEX LENS : Those lenses which are thicker in the middle than at the edges are called convex lenses.

- **A convex lens converges (bends inward) the light that falls on it .Therefore it is called a converging lens.**
- **A magnifying lens is a convex lens**

ACTIVITY : Take a convex or a magnifying glass .Put it in the path of sun rays. Place a sheet of paper below the lens . Adjust the distance between the lens and the paper till you get a bright spot on the paper. Hold the lens in this position for sometime.

OBSERVATION : After sometime you will observe that the paper kept below the magnifying lens in open sunlight catches Fire and starts burning.

WHY ? This happens because magnifying lens is a converging lens , so it converges the rays of sunlight falling on it to a single point on the paper. Since the rays of sun are heat radiation, So it raises the temperature of the paper and thus it starts burning.

Conclusion: The above activity shows that convex lens is converging lens (converges the rays of light to a single point).

2.CONCAVE LENS :Those lenses which are thinner at the middle than at the edges are called concave lenses.

- **A concave lens diverges (bends outwards) the light that falls on it. Therefore it is called diverging lens.**
- **A concave lens cannot make the paper to burn as convex lens did in the above activity. This is because concave lens diverges the rays of sunlight falling on the paper and thus the temperature of paper does not rise .So the paper does not catch fire.**

NATURE OF IMAGE FORMED BY LENSES

A convex lens forms an image that is :

- **The image formed by a convex lens may be smaller or larger than the object.**
- **The imagemay be real (can be obtained on a screen) or virtual (cannot be obtained on a screen).**
- **The image may be erect or inverted.**

A concave lens forms an image that is :

- **Virtual (cannot be obtained on a screen).**
- **Erect**
- **Small in size as compared to the size of object and appears far away from the lens.**

USES OF LENSES

- **Convex lens is used as a magnifying lens to see tiny objects.**
- **Lenses are used in spectacles .**
- **Lenses are used in microscopes.**

SUNLIGHT – WHITE OR COLOURED ?

Rainbow : The rainbow is seen as a large arc in the sky with many colours.It appears usually after the rain when the sun is low in the sky. When observed carefully , there are seven colours in a rainbow. These are arranged as VIBGYOR .

V is for violet

I is for indigo

B is for blue

G is for green

Y is for yellow

O is for orange

R is for red

Similarly when we blow soap bubbles , they appear colourful. Many colours are seen when light is reflected from the surface of a compact disc . All these experiences prove that sunlight is a mixture of different colours.

ACTIVITY TO SHOW THAT SUNLIGHT CONSISTS OF SEVEN COLOURS

Take a glass prism . Allow a narrow beam of sunlight through a small hole in the window of a dark room to fall on one face of the prism. Let the light coming out of the other face of the prism fall on a

white sheet of paper or on a white wall.

OBSERVATION : It is observed that light coming out of the other face of the prism consists of seven colourssimilar to those seen in a rainbow. This shows that the sunlight consists of seven colours. The sunlight is said to be white light. This means that the white light consists of seven colours.

DISPERSION OF LIGHT:The process of splitting white light into seven colourson passing through a prism is called dispersion of light and the pattern of seven distinct colours obtained on a screen is called spectrum.

NEWTON'S DISC

Take a circular cardboard disc and divide it into seven segments. Paint the seven colours as found in a rainbow . Make a small hole at the centre of the disc . Fix the disc loosely on the top of a refill of a ball pen . Now rotate the disc in the daylight. When the disc is rotated fast , the colourspainted on the disc get mixed together and the disc appears to be whitish. Such a disc is popularly known as

Newton' s disc.

With this the chapter is completed . Keep learning.

There is one worksheet for every module .Answer the questions in your notebook and learn them well.

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Stay safe , stay healthy.