

# To Observe Diffraction Of Light Due to a Thin Slit

## Aim

To observe diffraction of light due to a thin slit. .

## Apparatus

Two razor blades, adhesive tapes, a screen a source of monochromatic light (laser pencil) black paper and a glass plate.

## Theory

Diffraction is a phenomenon of bending of light around the corners or edges of a fine opening or aperture. Diffraction takes place when order of wavelength is comparable or small to the size of slit or aperture. The diffraction effect is more pronounced if the size of the aperture or the obstacle is of the order of wavelength of the waves. The diffraction pattern arises due to interference of light waves from different symmetrical point of the same wave front. The diffraction pattern due to a single slit consists of a central bright band having alternate dark and weak bright bands of decreasing intensity on both sides.

For diffraction,  $d \sin \theta = n\lambda$

Here  $d$  = size of aperture or slit

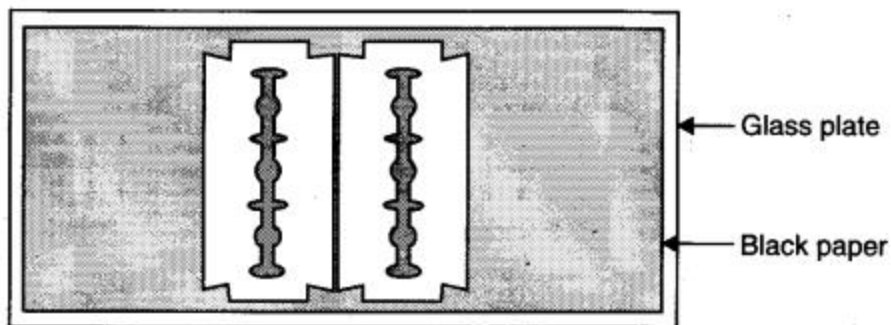
$\theta$  = angle of diffraction

$n$  = order of diffraction

$\lambda$  = wavelength of light.

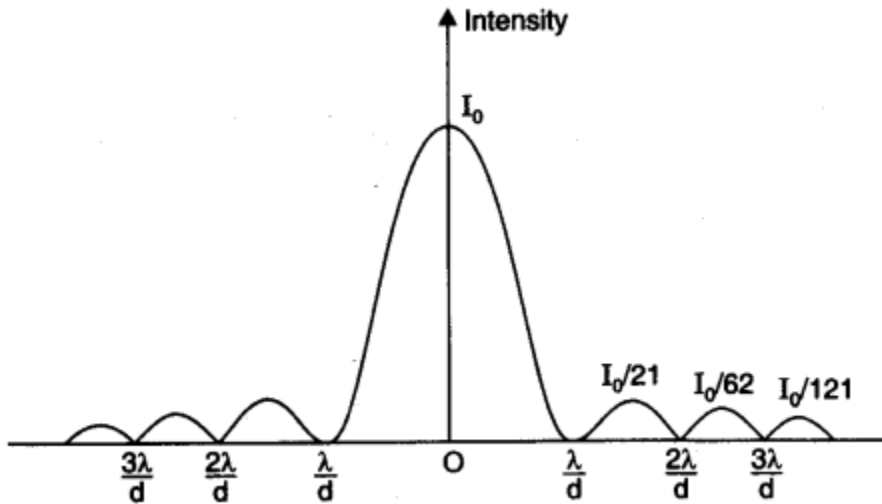
## Procedure

1. Fix the black paper on the glass plate by using adhesive.
2. Place two razor blades so that their sharp edges are parallel and extremely close to each other to form a narrow slit in between.



A thin slit made by using two razor blades, black paper and a glass plate.

3. Cut the small slit in between the sharp edges of blades and place at a suitable distance from a wall or screen of a dark room.
4. Throw a beam of light on the slit by the laser pencil.
5. A diffraction pattern of alternate bright and dark bands is seen on the wall.



### Conclusion

When light waves are incident on a slit or aperture then it bends away (spread) at the corners of slit showing the phenomena of diffraction of light.

### Precaution

1. Air gaps should not be left between glass plates and black paper.
2. The razor blades should be placed extremely closed as possible.
3. Diffraction pattern should be seen on a wall of a dark room.
4. A point source of monochromatic light like laser torch should be used.