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Worksheet: Light – Reflection and Refraction

1. Define 1 dioptre of power of a lens.
2. Light enters from air into glass which has a refractive index of 1.50. If the speed of light in vacuum is 3 × 10■ meters per second, what is the speed of light in the glass?
3. Which of the following lenses would you prefer to use while reading small letters found in a dictionary? (a) A convex lens of focal length 50 cm. (b) A concave lens of focal length 50 cm. (c) A convex lens of focal length 5 cm. (d) A concave lens of focal length 5 cm.
4. Which one of the following materials cannot be used to make a lens? (a) Water (b) Glass (c) Plastic (d) Clay
5. The radius of curvature of a spherical mirror is 20 cm. What is its focal length?
6. Name a mirror that can give an erect and enlarged image of an object.
7. A convex lens forms a real and inverted image of a needle at a distance of 50 cm from it. Where is the needle placed in front of the convex lens if the image is equal to the size of the object? Also, find the power of the lens.
8. We wish to obtain an erect image of an object, using a concave mirror of focal length 15 cm. What should be the range of distance of the object from the mirror? What is the nature of the image? Is the image larger or smaller than the object?
9. The refractive index of diamond is 2.42. What is the meaning of this statement?
10. Where should an object be placed in front of a convex lens to get a real image of the size of the object? (a) At the principal focus of the lens (b) At twice the focal length (c) At infinity (d) Between the optical centre of the lens and its principal focus.
11. A concave mirror produces three times magnified (enlarged) real image of an object placed at 10 cm in front of it. Where is the image located?
12. The image formed by a concave mirror is observed to be virtual, erect and larger than the object. Where should be the position of the object? (a) Between the principal focus and the centre of curvature (b) At the centre of curvature (c) Beyond the centre of curvature (d) Between the pole of the mirror and its principal focus.
13. Why do we prefer a convex mirror as a rear-view mirror in vehicles?
14. Define the principal focus of a concave mirror.
15. Find the focal length of a convex mirror whose radius of curvature is 32 cm.
16. A ray of light travelling in air enters obliquely into water. Does the light ray bend towards the normal or away from the normal? Why?
17. Find the power of a concave lens of focal length 2 m.

18. You are given kerosene, turpentine and water. In which of these does the light travel fastest?

19. No matter how far you stand from a mirror, your image appears erect. The mirror is likely to be (a) only plane. (b) only concave. (c) only convex. (d) either plane or convex.