

CLASS : X (CBSE)

WORKSHEET-1

SUBJECT : PHYSICS

NAME OF THE STUDENT:

SEC:

ROLL NO.

DATE:

Human Eye and the Colorful World

1. What is meant by power of accommodation of the eye?

2. What is the condition of the ciliary muscles of the eye when the eye is looking at a distant object. What is its effect on the focal length of the eye lens?

3. Why are we not able to see things clearly for some time when we enter from bright light to a darkened cinema hall?

4. A student has difficulty in reading the blackboard while sitting on the last desk. From what defect of vision is he suffering? How can it be corrected? Draw ray diagram for it.

5. What happens to the image distance in the eye when we increase the distance of an object from the eye?

What do you mean by dispersion?

6. Why do different colours deviate through different angles on passing through a prism?

7. Why does the sky appear dark instead of blue to an astronaut?

8. Why does the sun appear reddish early in the morning?

9. What is the cause of twinkling of stars?

10. Why are danger signal lights red in colour?

11. Why does the sun appear red at sunrise and sunset?

12. What are 'bifocal' lenses? Under what condition(s) are these required by a person?

13.

14.

Dispersion of light

LO: Describe how white light can be dispersed using a prism.

Starter: Refraction review (AFL)

Label the diagram with these keywords

Angle of refraction

Refracted ray

Glass block

Normal

Angle of incidence

Incident ray

NUMERICALS:

14. A person with a myopic eye cannot see objects beyond 1.2m distinctly. What should be the nature of corrective lens to restore proper vision? (P= -0.83 Lens – concave)
15. The near point of a hypermetropic eye is at 75 cm from the eye. What is the power of the lens required to enable him to read clearly a book held at 25 cm from the eye? (P= 2.66D)
16. A myopic person uses specs of power – 0.5D. What is the distance of far point of his eye?
17. A person wants to read a book placed at 20 cm, whereas near point of his eye is 30 cm. calculate the power of the lens required (1.67D).
18. The far point distance of a short-sighted person is 1.5meters. find the focal length, power and nature of the remedial lens? (-1.5 m, -0.67D, concave lens)
19. A person having a myopic eye uses a concave lens of focal length 10 cm. Find the power of the lens. (-10D)
20. A person with myopic eyes is nit able to see objects beyond 3 m. determine the nature, focal length and power of the correcting lens? (divergent, -3m,-3.3D)
21. A person can see clearly up to 3m. Name the defect of vision he is suffering from. What type of lens should be used so that he can clearly see up to 12m.find its power. (-0.25D)
22. A person with myopic eyes is nit able to see objects beyond 3 m. determine the nature, focal length and power of the correcting lens? (divergent, -3m,-3.3D)
23. A person can see clearly up to 3m. Name the defect of vision he is suffering from. What type of lens should be used so that he can clearly see up to 12m.find its power. (-0.25D)

CLASS : X (CBSE)

WORKSHEET-2

SUBJECT : PHYSICS

NAME OF THE STUDENT:

SEC:

ROLL NO.

DATE:

1. What is refraction?

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2. Sketch the path you would expect the light ray to follow on entering and exiting the glass block.

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3. What is the refractive index of the given mediums...

(a) in a vacuum? _____

(b) in air? _____

(c) in water? _____

(d) in glass? _____

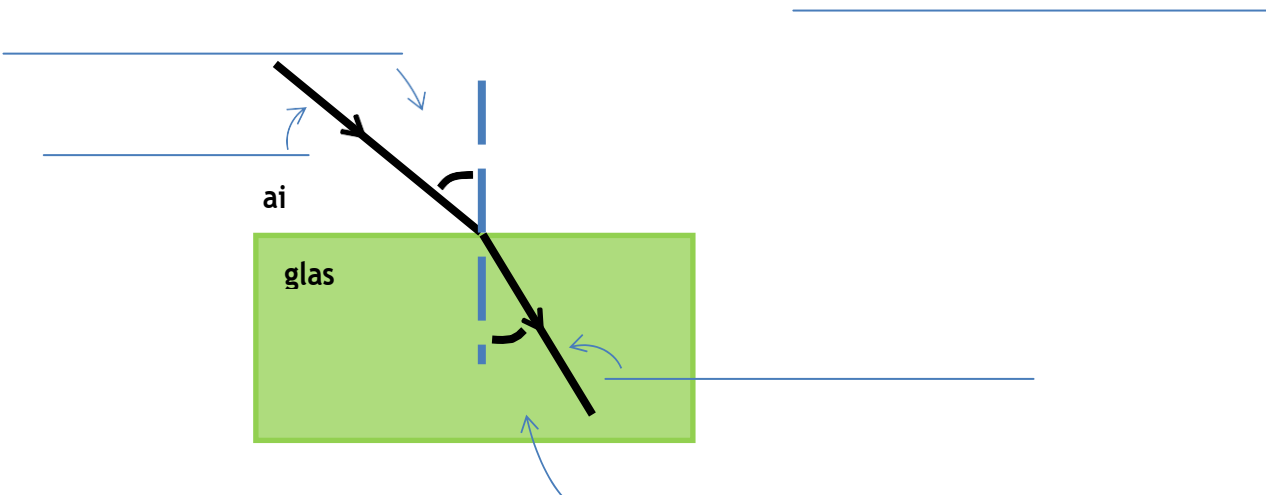
4. Why does refraction occur?

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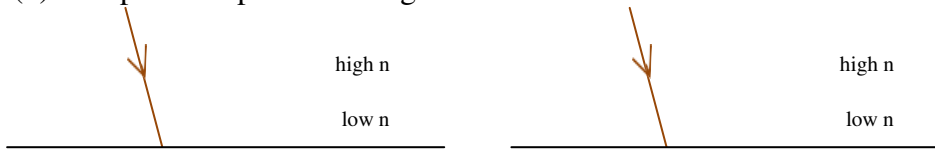
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5. Label the following diagram.

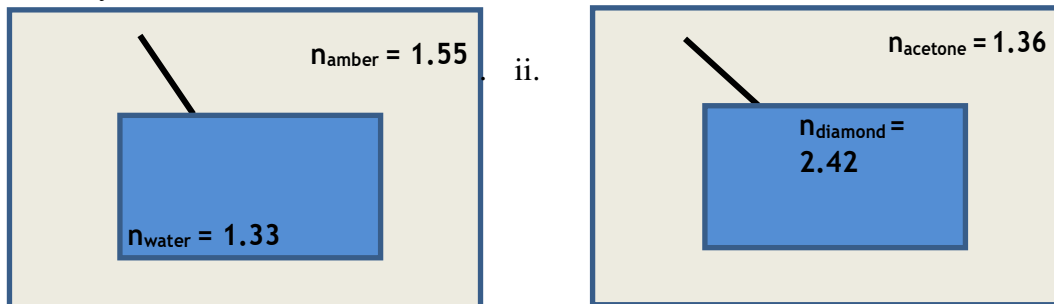


6. The higher the refractive index of a material, the _____ the speed of light within the material.

7. (a) When a light beam passes from a substance with a **high refractive index** to a substance with a **low refractive index** it turns towards/away from the normal. (Circle the correct answer.)
(b) Complete the path of the light beam.
8. (a) When a light beam passes from a substance with a **low refractive index** to a substance with a **high refractive index** it turns towards/away from the normal.
(b) Complete the path of the light beam.



9. (a) Sketch the light rays' paths as they pass through each material in the following situations.
(b) Draw in the normals. (You will need to work out whether the light ray refracts towards the normal or away from the normal)



10. Fill in the table.

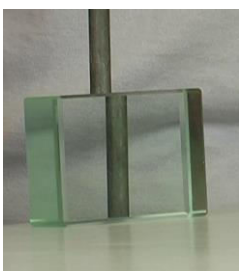
Angle of Incidence (in air)	Angle of refraction	
	in water ($n_{\text{water}} = 1.33$)	in Perspex ($n_{\text{perspex}} = 1.5$)
0		
40		
80		

11. Why does light refract more when it enters perspex than it does when it enters water?

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Part C: Refraction and Perception

12. Using text and a ray diagram, explain why the part of the metal bar which is behind the glass appears to be displaced.

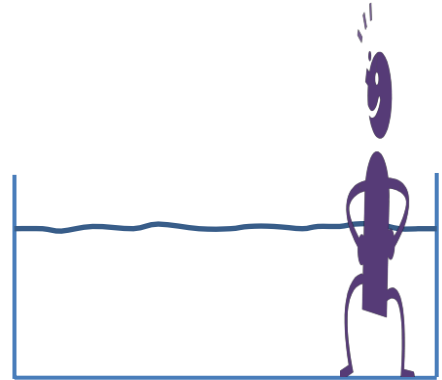


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13. Explain, using text and a ray diagram, why a person's legs appear shorter than they really are when they're standing in the water.





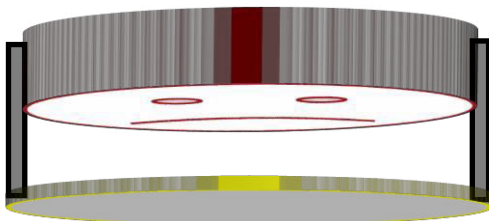
14. When you are using goggles or a face mask underwater, everything appears enlarged. Why?

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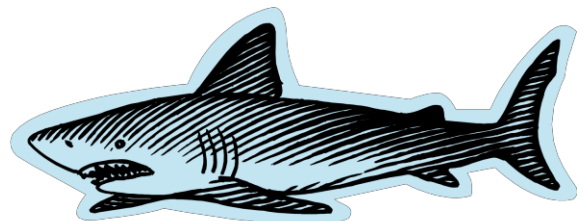
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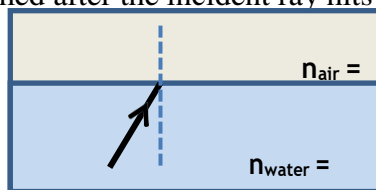


face mask



Part D: Total Internal Reflection

- In Figure 1, the ray of light shining upwards through the water strikes the undersurface of the water at a small angle of incidence. Some of the light will _____ as it exits the water, but some will _____ back into the water.
- Onto Figure 1, sketch the two rays formed after the incident ray hits the undersurface of the water.



Figure

3. Explain what is happening in the three diagrams above. You must use the expressions “critical angle” and “total internal reflection” (or “totally internally reflects”) in your answer.

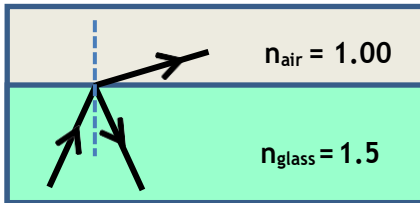


Figure A

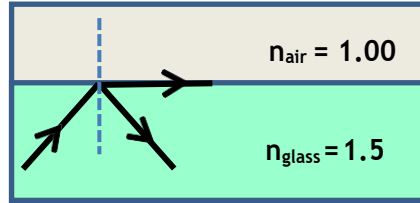


Figure B

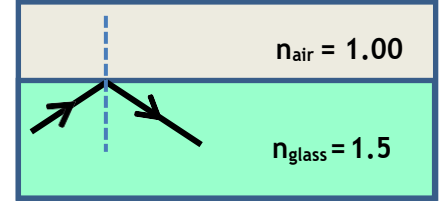
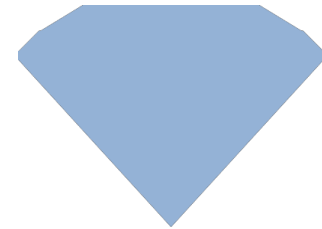


Figure C

4. Write **two** conditions necessary for total internal reflection to occur.

Part E: Examples of Total Internal Reflection

1. Using text and a diagram, describe why diamonds are so sparkly?



Diagram

2. Using text and a diagram, describe how an optical fibre works?