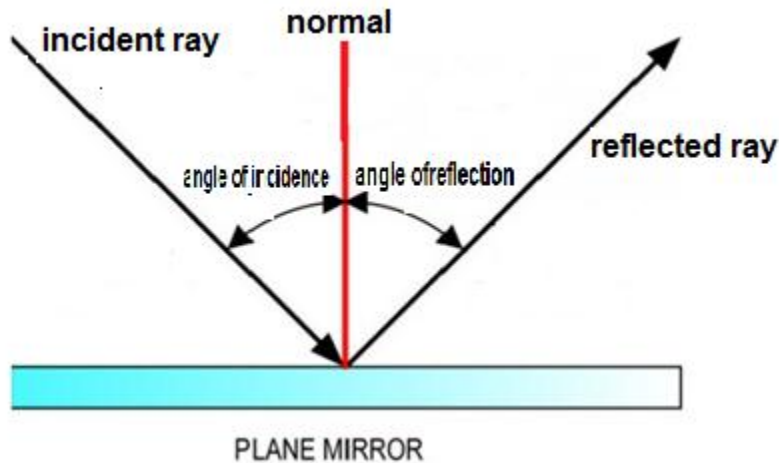
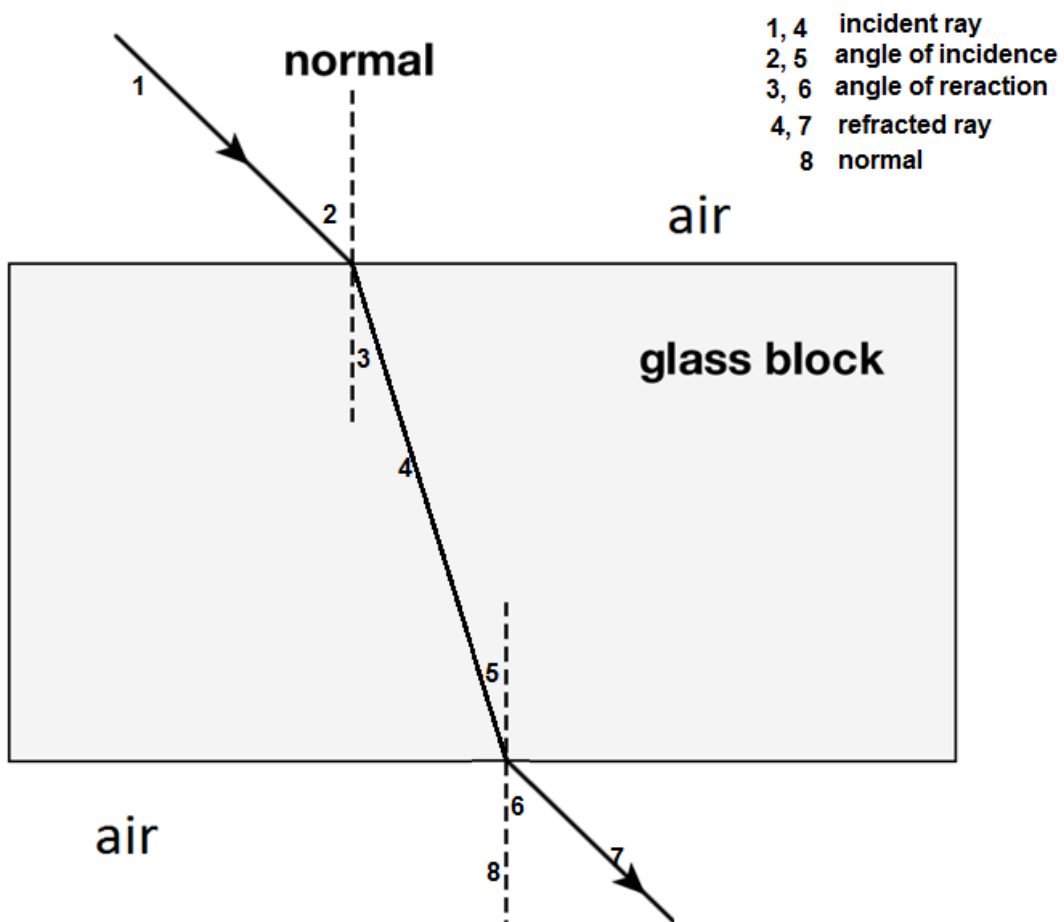


A Fill in the blanks

1. Angle of reflection **equals** the angle of incidence.

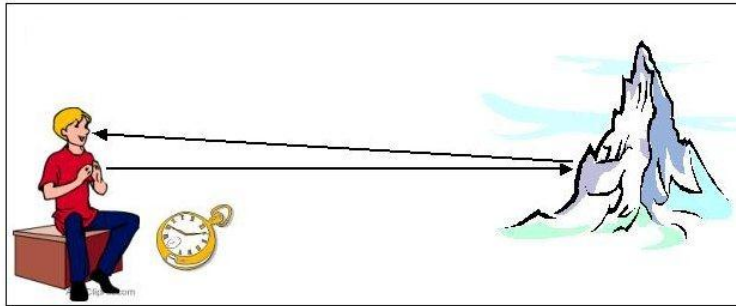


2. Light travelling from glass into air is **bent away** the normal. (Note:-Glass is denser than air)
3. Light travelling from air into water is **bent toward** the normal. (Note:-water is denser than air)

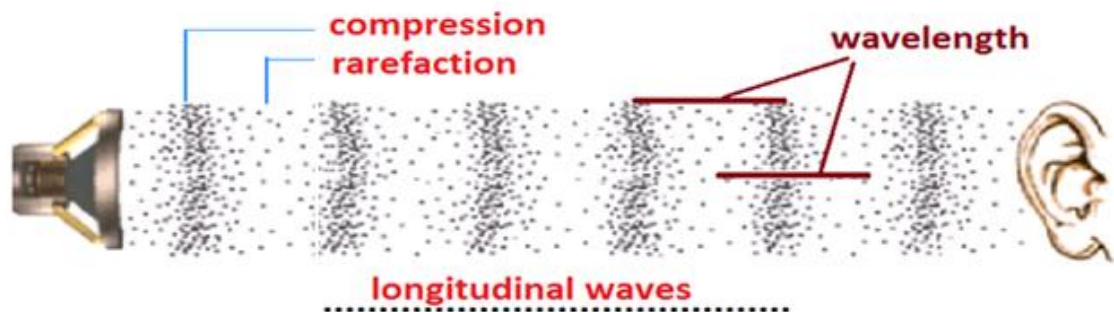


4. When moving from air into glass the speed of light **decreases**
5. When moving from water into air the speed of light **increases**
6. When moving from a medium into another medium the frequency of light does not **change**.

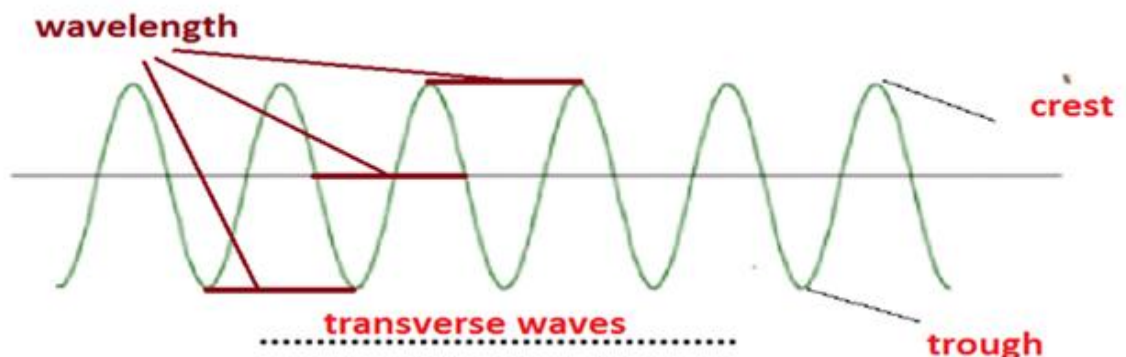
7. Sound waves travel in matter and cannot travel through **vacuum**.
8. The unit of frequency is **Hertz (Hz)** .
9. Reflection of sound waves is responsible for **Echo**



10. Light waves travel in **straight** lines.
11. The speed of light in vacuum is **300,000,000 m/s**.
12. Sound waves are caused by **vibrations**.



13. The direction of vibrations in a transverse wave is **perpendicular** to the direction of the wave.
14. The direction of vibrations in a longitudinal wave is **the same direction** of the direction of the wave.
15. Light waves are **transverse waves**.
16. Sound waves are **Longitudinal**.
17. A perpendicular line segment drawn at the point of incidence is called **normal**.
18. The point with the maximum displacement is called **crest**.



19. The point with the minimum displacement is called **trough**.
20. Time taken of one complete cycle of oscillation (wave) is called **period**.
21. Number of waves (oscillations) performed by a particle per unit time(second) is called **frequency**.

22. The distance between any two successive crests or two troughs is called **wavelength**.

B Answer the following questions.

1. A wave travels with a frequency (f) = 10 Hz. How much is the period (T)?

$$T = \frac{1}{10} = 0.1 \text{ s}$$

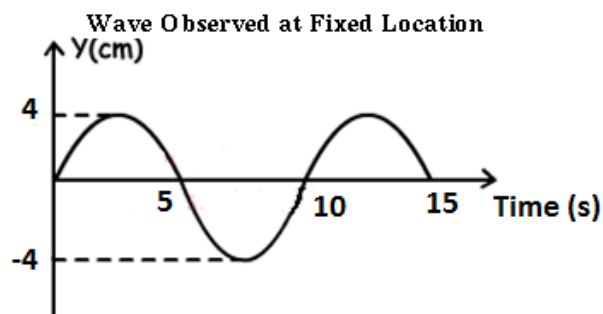
2. A sound wave travels with a wavelength (λ) = 0.1 m, and a frequency (f) = 3500 Hz. How much is the wave speed (v)?

$$v = f\lambda = 3500 \times 0.1 = 350 \text{ m/s}$$

3. A wave travels with a wavelength (λ) = 5 m, its wave speed (v) = 200 m/s. Find the frequency (f).

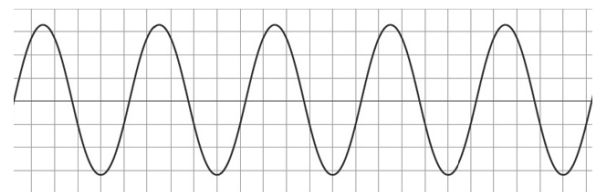
$$f = \frac{v}{\lambda} = \frac{200}{5} = 40 \text{ Hz}$$

4. The following figure represents a wave at fixed location. How much is the period of the wave? **10 s**,



5. The figure below shows waves passing a location point in 1 second.

- a. **Number of waves = 5**
- b. **Frequency (f) = 5 Hz**
- c. **Period (T) = $\frac{1}{5} = 0.2 \text{ s}$**



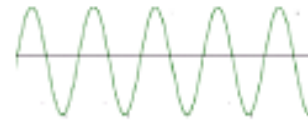
6. Which wave may represent a sound wave/ light wave/transverse/longitudinal waves?



Transveres



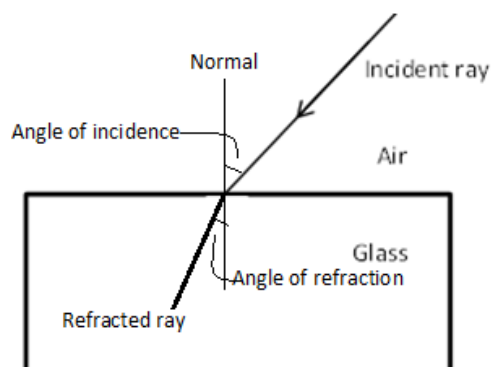
Longitudinal/sound



Transveres/light

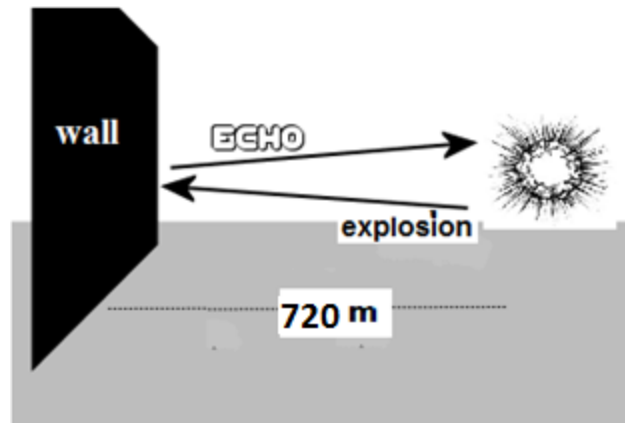
7. Clearly draw and label:

- a) Normal
- b) Angle of incidence
- c) Refracted ray
- d) Angle of refraction



8. An explosion happened in front of a wall. The wall is 720 m far from the location of the explosion as shown in the diagram below. The speed of sound is 340 m/s.

Calculate the echo time.



$$\text{Echo time} = 2 \times \frac{\text{distance to wall}}{\text{speed of sound}} = 2 \times \frac{720}{340} = 4 \text{ s}$$

9. Label the diagram:

1. Incident ray
2. Reflected ray
3. Normal
4. Angle of incidence
5. Angle of reflection

