Light Travels in Straight Lines (Ray Model)

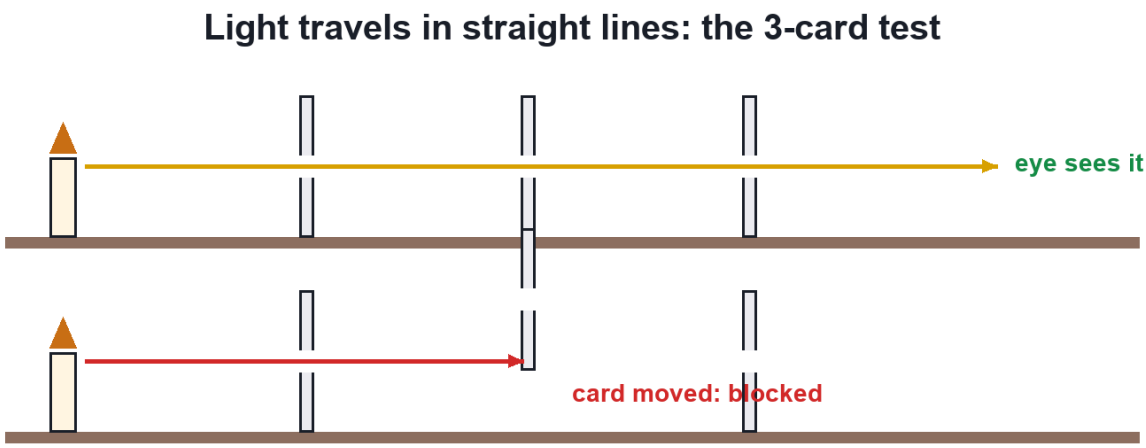
Class 10 Physics · Chapter: Light – Reflection and Refraction
🎬 **Video explanation (PrayogX reel):** https://www.instagram.com/reel/DfGoOEDgg9k/

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1. The corner puzzle

You can hear a friend round a corner but you cannot see them: sound bends round the corner, but light travels in straight lines (in a uniform medium).

2. Evidence: the 3-card test

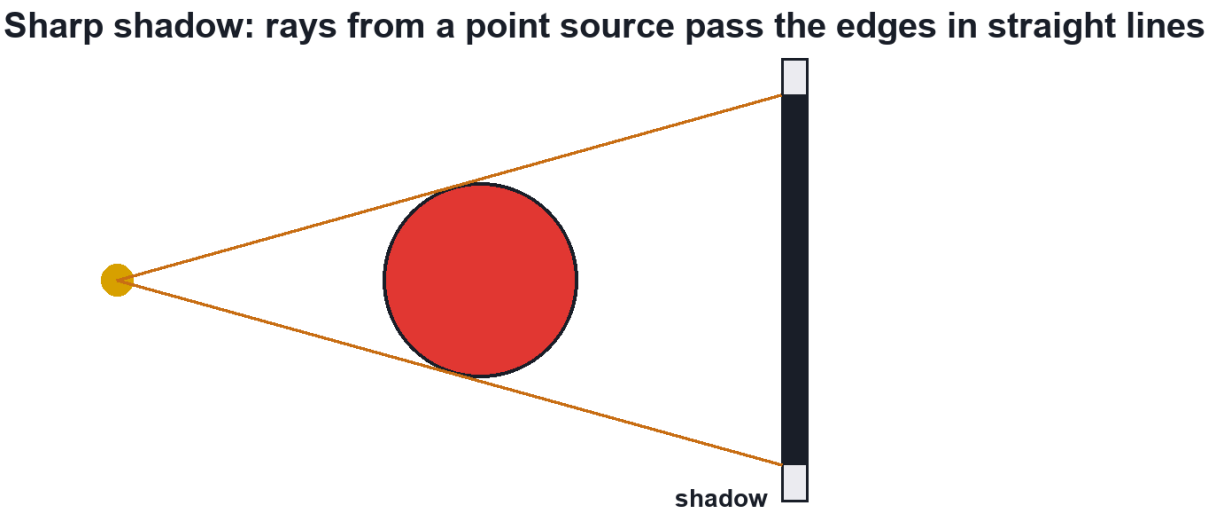


A candle is seen through holes in 3 cards only when the holes are in one straight line. Move one card and the candle disappears.

3. Ray and beam

Term	Meaning
Ray	A straight line with an arrow showing the path and direction of light
Beam	A bundle of rays (e.g. from a torch)

4. Sharp shadows



Rays from a small source pass the edges of an object in straight lines, so a sharp shadow forms behind it.

5. Why sound bends but light (practically) does not

Waves bend noticeably round obstacles comparable to their wavelength. Sound has a wavelength of about 1 m (similar to a doorway); visible light has a wavelength of about 0.0004-0.0007 mm, far smaller than everyday objects. So the **ray model** works for everyday sizes; it is a model and fails for very tiny openings.

6. Key takeaways

- Light travels in straight lines in a uniform medium.
- A ray shows the path and direction of light; many rays make a beam.
- Sharp shadows are evidence of straight-line travel.

Practice questions (CBSE style)

1. What is a ray of light? (1 mark)
2. Describe an activity to show that light travels in straight lines. (3 marks)
3. Why do we get sharp shadows from a small bulb? (2 marks)
4. Why can we hear but not see a person standing round a corner? (2 marks)
5. What is the difference between a ray and a beam of light? (1 mark)

Answer key with worked solutions

1. A straight line with an arrow that shows the path and direction of light.
2. Make holes in 3 cards, line them up with a candle behind and look through: the flame is seen only when all holes are in a straight line; shifting one card blocks it.
3. Rays from a point-like source pass the edges of the object in straight lines, so the boundary between light and shadow is sharp.

4. Sound has a large wavelength (about 1 m) and bends round the corner; light's wavelength is tiny, so it travels practically in straight lines.
5. A ray is a single straight line showing the direction of light; a beam is a bundle of many rays.