

# Lesson 5 - Refraction

Science - Physics - Key Stage 3

Light and Space

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# Recap questions

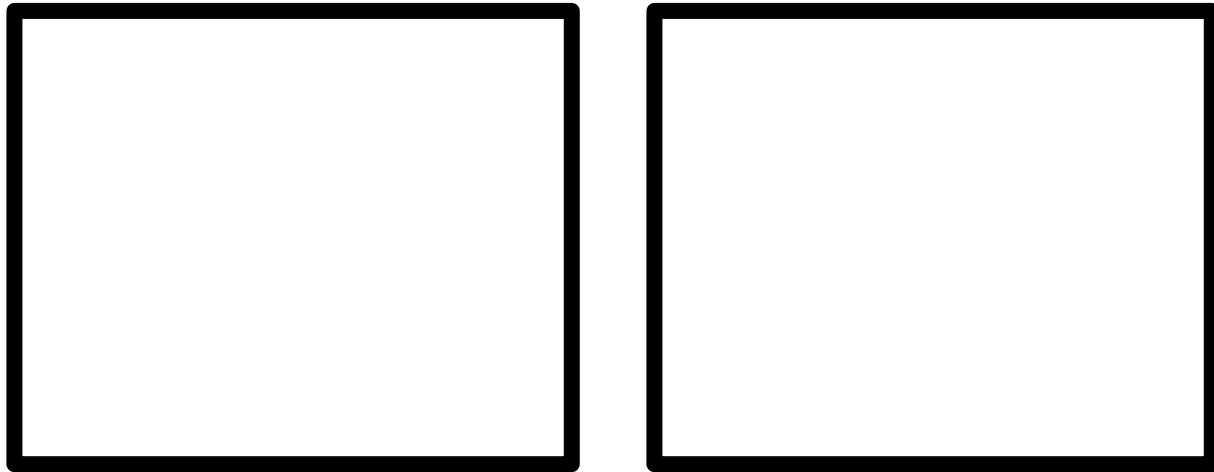
1. What kind of wave is light?

**T**\_\_\_\_\_

2. What is the maximum speed of light when travelling through a vacuum?

**The maximum speed of light is \_\_\_\_\_ m/s**

3. Draw the particle arrangement for a solid and a gas.



4. Which is most dense, a solid or a gas? Explain why.

**Solid is \_\_\_\_\_ dense because it has \_\_\_\_\_ particles in the same \_\_\_\_\_ of space**



## Task - complete gap fill

Refraction is when \_\_\_\_\_ waves change \_\_\_\_\_ due to travelling through a different \_\_\_\_\_, cause the wave to change \_\_\_\_\_. A medium is something that has particles, that waves will travel through, for example air or water.

When a pen is placed in water it looks bent because the light rays are \_\_\_\_\_ by the water because it has a higher \_\_\_\_\_ than air.

Key words: **direction, light, density, slows down, medium, speed**



# Task - put the following steps in the correct order

- A** - Using a protractor measure the angles of incidence and angle of refraction, and record them onto your diagram.
- B** - Place the glass block and prism in the middle of your page and draw around it.
- C** - Mark with x's where the light ray is entering the block and leaving the block.
- D** - Shine the ray of light, at an angle where at the point where the normal meets the block.
- E** - Draw a normal (perpendicular to the top of the block)
- F** - Using a ruler, join the x's up like a dot to dot to trace the light ray's path.



- 1. Describe what happens to the light ray as it travelled from the air into the glass block and then from the glass block back into the air.**
- 2. Explain why the light ray changes direction in the way that it does as it travels from the air to through the glass and back into the air.**

**Key words: normal line, angle of reflection, angle of incidence, speed, direction, density**



# Task

1. Calculate the averages in the table being careful to exclude anomalies and round up/down where necessary.
2. Describe the pattern in the data, using data from the table to support your statement.

**The angle of refraction is..**

3. Explain why the angle of refraction is always less than the angle of incidence.

**The light ray must be moving from a...**

**HINT: Consider density of medium**

Angle of Incidence (°)	Angle of Refraction (°)			
	Test 1	Test 2	Test 3	Average
10	6	4	5	
20	13	15	14	
30	20	20	34	
40	29	30	31	
50	35	40	35	

