N5 Refraction

N5 PHYSICS - WAVES TOPIC
Why?
Refraction - definition

Refraction is the reduction in speed and wavelength as a wave moves into a more optically dense material. This often involves a change of direction. (frequency stays the same)

Refraction is the increase in speed and wavelength as a wave moves into a less optically dense material. This often involves a change of direction. (frequency stays the same)
IMPORTANT NOTE

- Never use the term **bending** with the term **refraction**. ✗
- Please note bending does not occur with refraction, but there is often a change in direction of the wave.
Virtual Int 2 Physics

Refraction

Interactive summary
Example problem
Optical fibre
Critical angle and total internal reflection

Introduction
Refractive through blocks and prisms
REMEMBER

- All angles are measured from the normal.
- The angle of incidence is the angle in the air.
Try this OEQ

- Jot down a few bullet points before you start.

11. The use of analogies from everyday life can help better understanding of physics concepts. A car moving from a smooth surface to a rough surface, eg from a road to sand, can be used as an analogy for the refraction of light.

smooth road sand

Use your knowledge of physics to comment on this analogy.
Quite a good video but he wrongly says refract and bend in the same sentence, instant trouble at N5!

https://www.youtube.com/watch?v=zarxpu43-Is
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<td>Refraction of light</td>
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A ray of red light passes through a glass block as shown.

The diagram shows the path of a ray of red light as it passes from air into a glass block.

State the angle of incidence and angle of refraction.
11. A ray of red light passes through a double glazed window.
Which diagram shows the path of the ray as it passes through the window?

A
air | glass | air | glass | air

B
air | glass | air | glass | air

C
air | glass | air | glass | air

D
air | glass | air | glass | air

E
air | glass | air | glass | air

ray of red light
(c) Some of the infrared light is refracted when travelling from the glass windscreen into a raindrop.

(i) On the diagram, draw and label:

(A) a normal;  

(B) an angle of incidence $i$ and an angle of refraction $r$.  

(An additional diagram, if required, can be found on page 44.)

(ii) State whether the wavelength of the infrared light in the raindrop is less than, equal to or greater than the wavelength of the infrared light in the glass.

You must justify your answer.
A student carries out an experiment to investigate the effect of different shaped glass blocks on the path of a ray of light.

(a) The student directs a ray of red light at a triangular glass block as shown.

(i) Complete the diagram above to show the path of the ray of red light through and out of the glass block.  
(An additional diagram, if required, can be found on page 39)

(ii) The diagram shows a dashed line PQ. State the name given to this line.

(iii) On the diagram above, label an angle of incidence $i$.  

(b) The student replaces the triangular glass block with a rectangular block made of the same material. The path of the ray of red light is as shown.

State whether the wavelength of the red light in this block is less than, the same as, or greater than the wavelength of the red light in the triangular glass block in (a).

Justify your answer.