

OCR B Physics A Level

4.1.1 - Wave Behaviour

Flashcards

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What is wavelength?



What is wavelength?

Wavelength is the distance between equivalent points on two adjacent waves.



What is the displacement of a wave?



What is the displacement of a wave?

The distance the wave is from its equilibrium position.



What is the amplitude of a wave?



What is the amplitude of a wave?

The wave's maximum displacement from its equilibrium position.



What is the frequency of a wave?



What is the frequency of a wave?

Frequency is the number of waves that pass a point each second.



What is the unit of frequency?



What is the unit of frequency?

Frequency is measured in Hertz (Hz).



What is the time period of a wave?



What is the time period of a wave?

The time period of a wave is the time it takes for a whole wave to pass a given point.



What is the relationship between frequency and time period?



What is the relationship between frequency and time period?

$$\textit{Time Period} = 1/\textit{Frequency}$$



What is the phase of a wave a measure of?



What is the phase of a wave a measure of?

The phase is a measure of how far through its cycle a wave is.



What does it mean if two waves are in phase?



What does it mean if two waves are in phase?

- Two waves that are in phase with each other are at the same position in their cycles.
- Their phase difference is zero (or a multiple of 360°).



What does it mean if two waves are in antiphase?



What does it mean if two waves are in antiphase?

The waves are an odd multiple of 180°
 $/\pi$ radians out of phase.



What can be said about the phase difference of coherent waves?



What can be said about the phase difference of coherent waves?

Coherent waves have a constant phase difference.



What is path difference?



What is path difference?

Path difference is the difference between the distances travelled by two waves.



What is a standing wave?



What is a standing wave?

A standing wave is a wave that appears to remain in a fixed position.



What effect produces a standing wave?



What effect produces a standing wave?

Standing waves are produced by
superposition.



Describe the energy transfer in a standing wave.



Describe the energy transfer in a standing wave.

Standing waves store energy - they don't transfer it from one point to another.



In the formation of a standing wave, what occurs when the two waves are in phase?



In the formation of a standing wave, what occurs when the two waves are in phase?

When the waves meet in phase, constructive interference occurs and an antinode is formed.



What is an antinode?



What is an antinode?

A point of maximum displacement.



In the formation of a standing wave, what occurs when the two waves meet in antiphase?



In the formation of a standing wave, what occurs when the two waves meet in antiphase?

When the waves meet in antiphase, destructive interference occurs and a node is formed.



What is a node?



What is a node?

A point of zero displacement.



What always forms at the end of an open tube?



What always forms at the end of an open tube?

An antinode will always form at the open end of a tube.



What always forms at the closed end of a tube?



What always forms at the closed end of a tube?

A node will always form at the closed end of a tube.



What is the distance between two adjacent nodes equal to?



What is the distance between two adjacent nodes equal to?

The distance between two adjacent nodes is equal to half the wavelength of the standing wave.



Can standing waves be formed in longitudinal waves?



Can standing waves be formed in longitudinal waves?

Yes - Standing waves can be formed in both transverse and longitudinal waves.



What is refraction?



What is refraction?

Refraction is the change in speed of a wave as it changes medium, causing a change in direction.



What happens to the speed of a wave as it passes from a less dense medium into a more dense one?



What happens to the speed of a wave as it passes from a less dense medium into a more dense one?

The wave speed will reduce.



What happens to the direction of a wave as it passes from a less dense medium into a more dense one?



What happens to the direction of a wave as it passes from a less dense medium into a more dense one?

It will bend towards the normal.



Compare the angles of incidence and refraction for a wave passing into a less optically dense medium.



Compare the angles of incidence and refraction for a wave passing into a less optically dense medium.

The angle of refraction will be greater than the angle of incidence since the light will speed up and bend away from the normal.



What is refractive index a measure of?



What is refractive index a measure of?

The refractive index is the ratio of the speed of light in two different mediums.



What is a material's absolute refractive index?



What is a material's absolute refractive index?

The absolute refractive index of a material is the ratio of the speed of light in that material to the speed light in a vacuum.



What is diffraction?



What is diffraction?

Diffraction is the spreading out of waves as they pass through a gap.



When is diffraction at its greatest?



When is diffraction at its greatest?

Diffraction is at its greatest when the wavelength and the gap are of the same magnitude.



What experiment supported the wave theory of light?



What experiment supported the wave theory of light?

Young' double slit experiment.



What observations were made in Young's double slit experiment?



What observations were made in Young's double slit experiment?

The light rays passing through each gap diffracted and interfered with each other to form a series of bright and dark fringes.



How are bright fringes produced in Young's double slit experiment?



How are bright fringes produced in Young's double slit experiment?

The two waves meet in phase and so constructively interfere to produce a point of maximum intensity.



How are dark fringes produced in Young's double slit experiment?



How are dark fringes produced in Young's double slit experiment?

The two waves meet in antiphase and so destructively interfere to produce a point of minimum intensity.

