

# Edexcel Physics A-Level

## Topic 5.1 - Progressive and Stationary Waves

### Flashcards

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# What is a wave's amplitude?



## What is a wave's amplitude?

The amplitude of a wave is its maximum displacement from its equilibrium position.



# What is a wave's frequency?



## What is a wave's frequency?

The frequency of a wave is the number of complete waves that pass a point per second.



# What is meant by the period of a wave?



What is meant by the period of a wave?

The period of a wave is the length of time taken for one complete wave to pass a given point.



# How are frequency and period linked?





How are frequency and period linked?

$$\text{Frequency} = 1/\text{Period}$$

They are reciprocals of each other.



# What is wavelength?



## What is wavelength?

The distance between the same point on two adjacent waves (for example peak-peak or trough-trough).



State the equation used to calculate a wave's speed.



State the equation used to calculate a wave's speed.

$$v = f\lambda$$

Speed = Frequency x Wavelength



Describe a longitudinal wave.



Describe a longitudinal wave.

- Particle oscillations are parallel to the direction of the wave's motion
- Consists of rarefactions (low pressure regions), and compressions (high pressure regions)



Describe a transverse wave.





Describe a transverse wave.

- Particle oscillations are perpendicular to the direction of the wave's motion
- Consists of peaks (maximum positive displacement) and troughs (maximum negative displacement)



# What is a progressive wave?



## What is a progressive wave?

A progressive wave is one that transfers energy from one point to another without any transfer of matter.



# What is a standing wave?



## What is a standing wave?

A wave that stores energy rather than transferring it from one place to another.



# What is path difference a measure of?



What is path difference a measure of?

Path difference is a measure of how far ahead one wave is compared to another.



# What is a wave's phase?





## What is a wave's phase?

A wave's phase at a given point is a measure of how far through its cycle the wave is. It is usually measured in radians, where a complete cycle is  $2\pi$ .



What is the phase difference between two waves at a given point?



What is the phase difference between two waves at a given point?

The phase difference is the difference between the phases of the two waves - in other words, it is a measure of the difference between how far each wave is through its cycle.



# What happens when two waves meet?



What happens when two waves meet?

The two waves will interfere with each other.



What happens when two waves meet in phase?



What happens when two waves meet in phase?

They will interfere and undergo  
constructive interference.



What happens when two waves meet in antiphase?





What happens when two waves meet in antiphase?

They will interfere and undergo destructive interference.



# How is a standing wave formed on a string?



## How is a standing wave formed on a string?

- A wave reflects from a closed end meaning two identical waves are travelling in opposite directions down the same string
- At points where the waves meet in phase, constructive interference occurs and an antinode is formed
  - At points where the waves meet in antiphase, destructive interference occurs and a node is formed



# What is a node?



## What is a node?

A node is a point of minimum displacement - there is no movement from the equilibrium position.



# What is an antinode?



## What is an antinode?

An antinode is a point of maximum displacement.



What two factors does the speed of a transverse wave on a string depend on?





What two factors does the speed of a transverse wave on a string depend on?

1. Time period
2. Mass per unit length of the string



State the equation used to calculate the speed of a transverse wave on a string.



State the equation used to calculate the speed of a transverse wave on a string.

$$v = \sqrt{\frac{T}{\mu}}$$

