Waves

Organise the method used to prepare a microscope slide:

- Switch on the vibration generator. The elasticated cord should start to vibrate.
- Calculate the speed of the wave using the equation: wave speed = frequency x wavelength.
- Adjust the tension in the string or move the wooden bridge to adjust the length of the string, until a clear wave pattern is seen.
- Attach the signal generator to the vibration generator.
- The **frequency** is the frequency of the power supply.
- The waves should look like they are stationary.
- Use a metre ruler to measure across as many half wavelengths as possible (a half wavelength is one loop).
- Then divide the total length by the number of half waves. Multiplying this number by two will give the **wavelength**.
- Attach one end of a piece of elasticated cord to the signal generator and some masses on a pully to the other.

Precision and Accuracy

Describe and Explain how these changes would affect Precision and Accuracy:

Measuring the wavelength in mm
Affect:…………………………………………………………………..
Explanation: ………………………………………………………
……………………………………………………………………………..

Repeating the wavelength measurements , removing anomalous results and doing a mean average.
Affect:…………………………………………………………………..
Explanation: ………………………………………………………
……………………………………………………………………………
One of your own suggestions:
……………………………………………………………………………
…………………………………………………………………………..
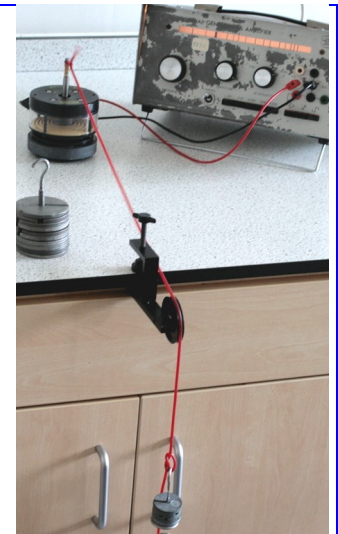
Speed Of Waves

Rearrange this formula to find:

Formula
Speed = Frequency x Wavelength

Frequency =

Wavelength =

Units of **Speed** are…………….
Units of **Frequency** are…………….
Units of **Wavelength** are…………….

Help?
100cm = 1m

cm → m ÷100
m → cm x1000

1 cm = 100m

Calculations

Use the equations opposite to calculate the following:

1. If the frequency of the wave is 100Hz and the wavelength is 0.25m, what is the speed of the waves?

2. If the frequency of the wave is 250Hz and the wavelength is 0.2m, what is the speed of the waves?

3. If the frequency of the wave is 300Hz and the wavelength is 10 cm, what is the speed of the waves? (Remember to convert to m)

4. If the frequency of the wave is 1000Hz and the wavelength is 2cm, what is the speed of the waves? (Remember to convert to m)

Plan

Without turning over (!) write a step by step plan for measuring the speed of a waves.

Variables:

State what the variables are:

Independent:

Dependent:

Control Variables:

1................................

How would you control this variable so it did not affect the results?

....

....

....

2................................

How would you control this variable so it did not affect the results?

....

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....

How would changing the mass affect the tension in the elastic?

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How would it affect the speed of the wave? Why?

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