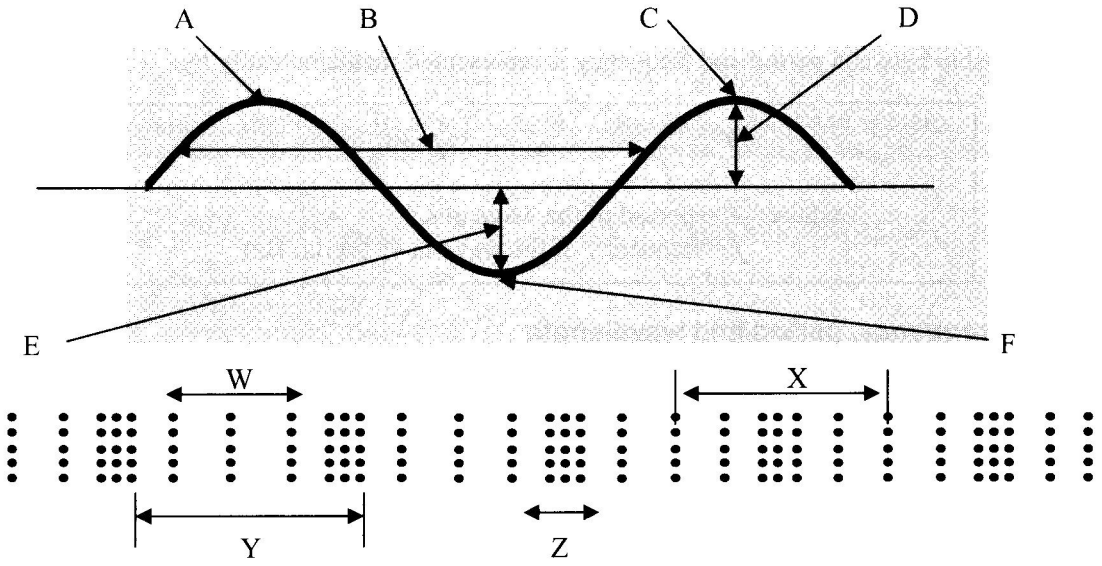
YEAR 11 HSC PHYSICS
MODULE 8.2 – THE WORLD COMMUNICATES
Worksheet – Describing Waves

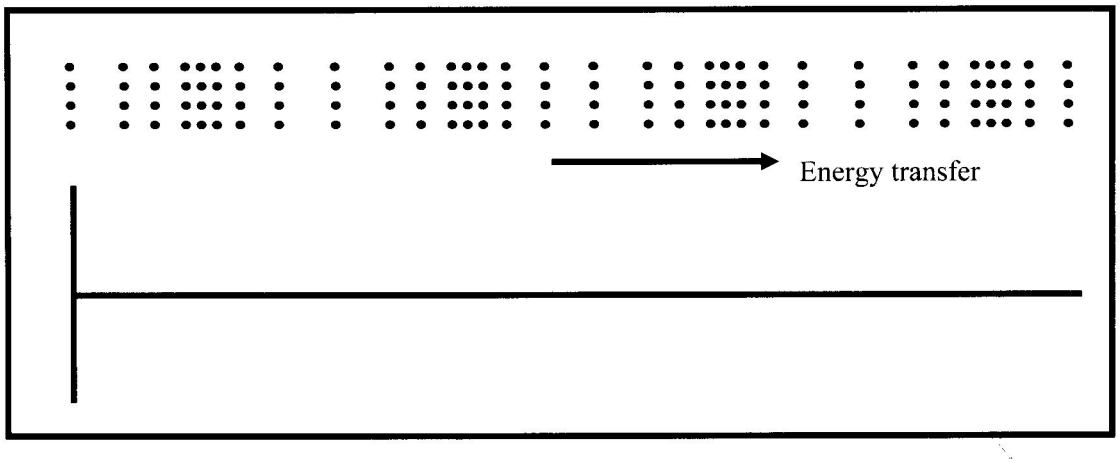
8.2.1

Set 1 – Properties of Waves

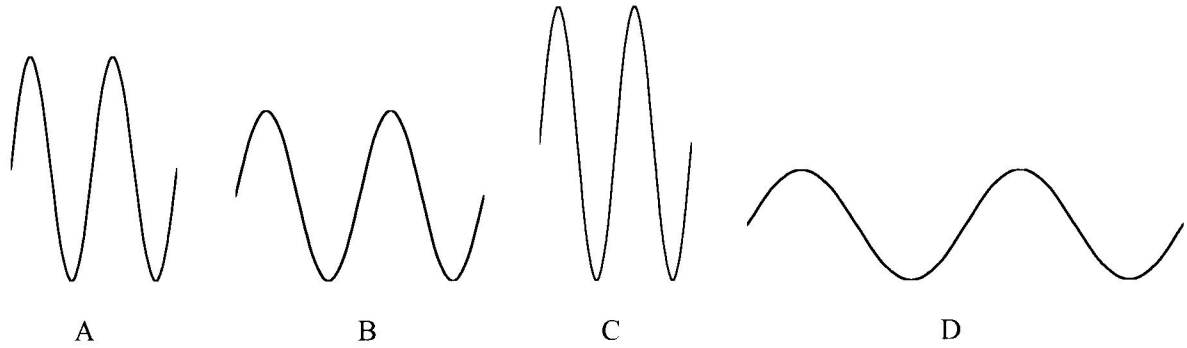
1. Identify and label the parts of the waves shown below.



2. Because they are difficult to draw, we represent longitudinal waves as sine waves. Draw a sine wave to represent the longitudinal wave below.



3. The waves all shown below represent the same interval of time. List them in order of increasing wavelength, amplitude and then in order of increasing frequency.



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Set 2 – Wave Equation

4. Sound travels through air at about 330 ms^{-1}. Calculate the wavelength of the sound of frequency 256 Hz.

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5. The 'C' above middle C on a piano has a frequency of 512 Hz. Calculate its wavelength.

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6. The speed of light is 3.0×10^8 ms^{-1}. Violet light has a wavelength of about 400 nm. Calculate the frequency of this light.

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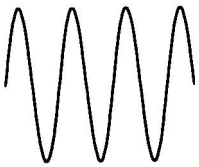
7. The table below shows information about the various colours of visible light. Calculate the missing data.

Colour	Frequency (Hz)	Wavelength (nm)
Red		750
Orange		600
Yellow		580
Green		540
Blue	6.0×10^{14}	
Indigo	6.7×10^{14}	

8. Each wave shown has been drawn life size. Each represents 1.0 s of time. For each wave find its wavelength, amplitude, frequency, period and velocity.

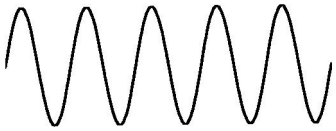
A

B

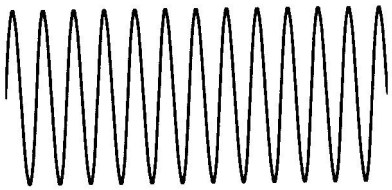


C

D



E



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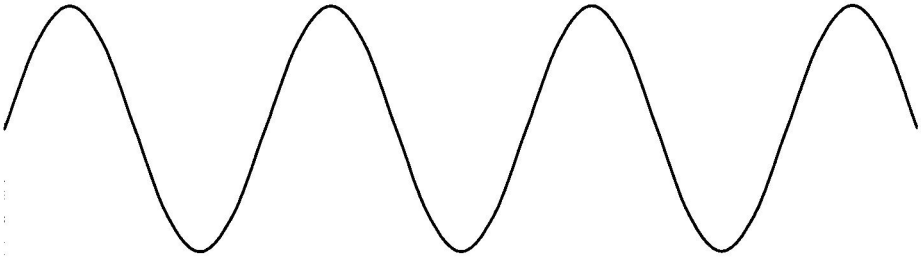
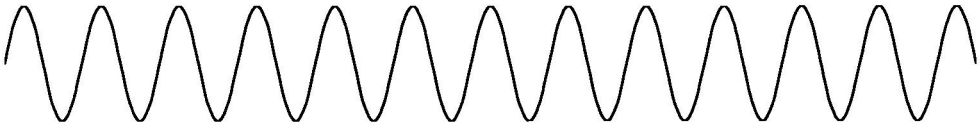
Set 3 – Analysing Wave Diagrams

9. Below are several waves and the length of each time each has been travelling. Analyse each to determine its wavelength, amplitude (A, B and C only), frequency, period and velocity. Each wave is shown actual size.

A = 0.7 s

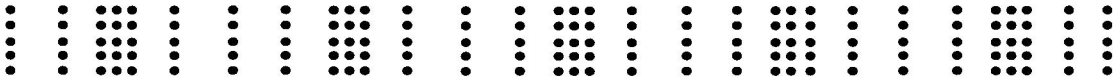


B = 2.5 s

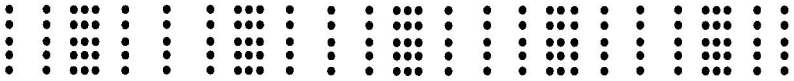


C = 0.025 s

D = 0.02 s



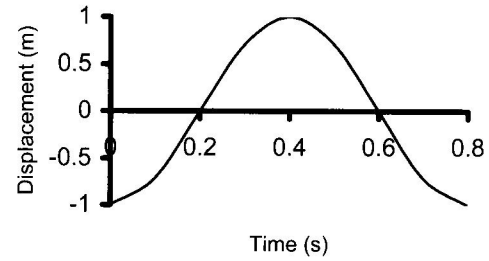
E = 4.3×10^{-4} s



F = 4×10^{-3} s

Wave	Wavelength (cm)	Amplitude (cm)	Frequency (Hz)	Period (s)	Velocity (ms^{-1})
A					
B					
C					
D					
E					
F					

10. The graph below shows the displacement of a particle in a wave of wavelength 4.0 m. Determine the period, frequency, amplitude and speed of the wave.



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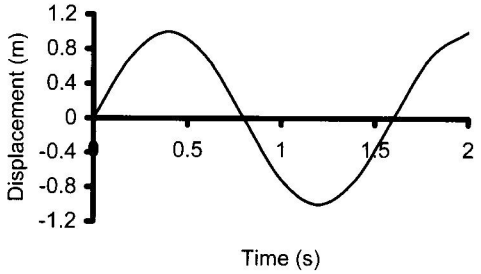
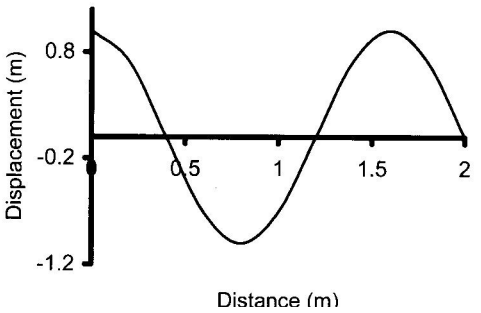
11. The graphs shown the displacement of a water particle plotted against the distance the wave travels and time. Analyse these graphs to determine the wavelength, period, frequency, amplitude and frequency of a water wave.





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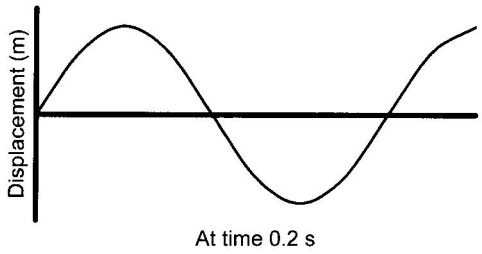
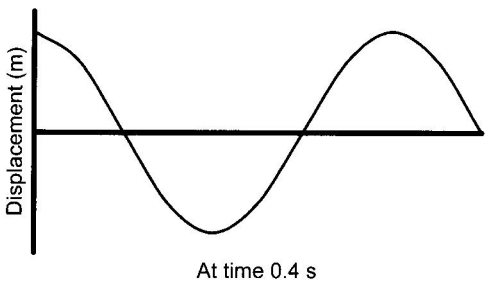
12. The graphs show the position of the same wave 0.2 s apart. Analyse them to calculate the maximum possible period for the wave.





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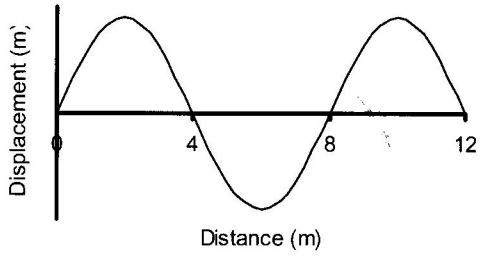
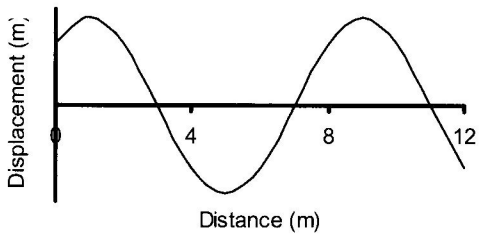
13. The graphs show two positions of a wave 0.1 s apart. Calculate the wavelength, frequency, period and speed of the wave.





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