

Wave Speed, Frequency and Time Period Ramped Calculations

These ramped GCSE Physics questions require you to combine your knowledge of wave speed, frequency and time period. You will need to use both the wave equation and the relationship between frequency and time period.

1. Water waves travel at 4 m/s and have a wavelength of 2 m.
 - a) Calculate the frequency.
 - b) Calculate the time period.
 - c) How many waves are produced in 20 s?
2. A sound wave has a wavelength of 0.85 m and travels at 340 m/s.
 - a) Calculate the frequency.
 - b) Calculate the time period.
 - c) How far does the wave travel in 5 s?
3. A wave has a frequency of 8 Hz and travels at 16 m/s.
 - a) Calculate the wavelength.
 - b) Calculate the time period.
 - c) How many waves are produced in 30 s?
4. A wave has a time period of 0.25 s and travels at 2 m/s.
 - a) Calculate the frequency.
 - b) Calculate the wavelength.
 - c) How far does the wave travel in one time period?
5. A radio wave has a wavelength of 500 m and travels at 3×10^8 m/s.
 - a) Calculate the frequency.
 - b) Calculate the time period.
 - c) How many waves are produced in 0.02 s?
6. A loudspeaker produces a sound with a frequency of 400 Hz. The speed of sound is 340 m/s.
 - a) Calculate the wavelength.
 - b) Calculate the time period.
 - c) How many vibrations occur in 2 s?
7. An ultrasound wave has a frequency of 40 000 Hz and travels at 1500 m/s.

- a) Calculate the wavelength.
 - b) Calculate the time period.
 - c) How many waves are produced in 0.1 s?
8. A wave has a time period of 0.002 s and a wavelength of 0.8 m.
- a) Calculate the frequency.
 - b) Calculate the wave speed.
 - c) How far does the wave travel in 10 s?
9. An earthquake wave travels at 6000 m/s and has a frequency of 20 Hz.
- a) Calculate the wavelength.
 - b) Calculate the time period.
 - c) How many waves pass a point in 3 minutes?
10. A submarine detects sonar waves travelling at 1600 m/s. The time period of the waves is 0.00005 s.
- a) Calculate the frequency.
 - b) Calculate the wavelength.
 - c) How many waves are produced in 1 s?