Units

Quantities and their units

write the unit for each quantity

QUANTITY	SYMBOL	UNIT
wave speed	v	.....
distance	s	.....
time	t	.....
frequency	f	.....
wavelength	λ	.....

QUANTITY	SYMBOL	UNIT
time period	T	.....
angle of incidence	i	.....
angle of refraction	r	.....
critical angle	c	.....
refractive index	n	.....

Choose the correct unit

tick one box for each

1 The unit of **refractive index** is:

☐ m/s ☐ ° (degrees) ☐ Hz ☐ no unit

2 A frequency of **1 Hz** means:

☐ 1 wave per second ☐ 1 wave per minute

☐ 1 metre per second

3 The **time period** of a wave is measured in:

☐ Hz ☐ s ☐ m ☐ ° (degrees)

4 The **critical angle** is measured in:

☐ m ☐ ° (degrees) ☐ Hz ☐ no unit

Add the correct unit

write m/s, m, s, Hz, ° or "no unit"

(a) Sound travels through air at 340 .....

(b) A radio wave has a wavelength of 1500 .....

(c) Middle C on a piano has a frequency of 262 .....

(d) The time period of the wave is 0.02 .....

(e) The critical angle for glass is 42 .....

(f) The refractive index of glass is 1.5 .....

Unit conversions

fill in the missing number

2 kHz = ... Hz

5 MHz = ... Hz

25 cm = ... m

20 ms = ... s

1.7 km = ... m

0.5 m = ... cm

The golden rule — always convert before you calculate. Put **frequency in Hz**, **distance and wavelength in m** and **time in s**. kHz → Hz: **× 1000**. MHz → Hz: **× 1 000 000**. cm → m: **÷ 100**. ms → s: **÷ 1000**. Angles stay in **degrees**, and refractive index has **no unit**.

Exam-style question

A student shines a ray of light from air into a glass block and measures the angles from the normal.

(a) State the unit of the angle of incidence. **[1]**

(b) The student calculates the refractive index of the glass as 1.5. State the unit of refractive index. Give a reason for your answer. **[2]**

(c) The light is replaced by a sound wave with a wavelength of 85 cm. Give this wavelength in metres. **[1]**

(d) The sound travels 1.7 km in 5.0 s. Calculate its speed. Give the unit. **[3]**

(Total for question = 7 marks)

ANSWER