

7. Waves

Starter Quiz · 课前小测

A-Level Physics

Name: _____ Score: _____

1. A progressive wave carries energy without moving matter along overall.

☐ True ☐ False

2. In a transverse wave, the particles vibrate:

☐ perpendicular to the direction of travel

☐ parallel to the direction of travel

☐ in circles around the source

☐ not at all

3. As a sound source moves **toward** you, the pitch you hear is:

☐ higher than the source

☐ lower than the source

☐ the same as the source

☐ silent

4. All electromagnetic waves are transverse.

☐ True ☐ False

5. Polarising a transverse wave means making it vibrate:

☐ in one plane only

☐ faster

☐ in all planes at once

☐ along the direction of travel

6. A wave has a period of 0.020 s. What is its frequency?

_____ Hz

7. Sound travelling through air is a longitudinal wave.

☐ True ☐ False

8. A source moving toward an observer bunches the wavefronts ahead of it.

☐ True ☐ False

9. In a vacuum, which EM wave travels the fastest?

☐ They all travel at the same speed

☐ gamma rays

☐ radio waves

☐ visible light

10. Sound waves can be polarised.

☐ True ☐ False

1. **True**

Yes — the particles only oscillate about fixed points; the disturbance and its energy are what travel.

2. **perpendicular to the direction of travel**

Transverse = vibration at right angles to the energy flow (a rope wave, light, water ripples).

3. **higher than the source**

Moving toward you bunches the wavefronts, shortening the wavelength and raising the frequency you hear.

4. **True**

Yes — every EM wave is transverse, and all travel at c in a vacuum.

5. **in one plane only**

A polarising filter passes only the vibration lined up with its axis, leaving the wave in a single plane.

6. **50 Hz**

$$f = \frac{1}{T} = \frac{1}{0.020} = 50 \text{ Hz.}$$

7. **True**

Yes — the air particles vibrate back and forth along the travel direction, making compressions and rarefactions.

8. **True**

Yes — each new wavefront is sent from a point a little closer, so they crowd together in front.

9. **They all travel at the same speed**

In a vacuum every EM wave travels at $c = 3.0 \times 10^8 \frac{\text{m}}{\text{s}}$.

10. **False**

No — sound is longitudinal (it vibrates along the travel), so there is no other plane to pick out.