

3. Waves

Starter Quiz · 课前小测

IGCSE Physics

Name: _____ Score: _____

1. A wave carries matter along with it from place to place.
☐ True ☐ False
2. A ray hits a plane mirror at 30° to the normal. At what angle to the normal does it reflect?
☐ 30° (angle of reflection = angle of incidence)
☐ 60°
☐ 90°
☐ 0°
3. A converging lens makes parallel rays of light:
☐ meet at the principal focus
☐ spread out as if from a point
☐ carry straight on unchanged
☐ stop completely
4. In a vacuum, how do the speeds of radio waves, light and gamma rays compare?
☐ they all travel at the same speed
☐ gamma rays are fastest
☐ radio waves are fastest
☐ visible light is fastest
5. Sound travels as a series of:
☐ compressions and rarefactions (a longitudinal wave)
☐ crests and troughs at right angles to travel
☐ electromagnetic waves
☐ still particles
6. A wave has frequency 5.0 Hz and wavelength 2.0 m. What is its speed, in m/s?
_____ m/s
7. An image in a plane mirror is:
☐ virtual, the same size, and as far behind the mirror as the object is in front
☐ real and can be shown on a screen

- ☐ smaller than the object
- ☐ upside down

8. The distance from the lens to its principal focus is called the _____ length.

9. Sound can travel through a vacuum (empty space).
☐ True ☐ False
10. A sound wave travels at 330 m/s with a frequency of 110 Hz. What is its wavelength, in m?
_____ m

1. **False**

A wave carries energy, not matter. A floating cork bobs up and down but does not travel with the wave.

2. **30° (angle of reflection = angle of incidence)**

The law of reflection: the angle of reflection equals the angle of incidence, both measured from the normal.

3. **meet at the principal focus**

A converging (convex) lens bends parallel rays inward so they meet at the principal focus.

4. **they all travel at the same speed**

All electromagnetic waves travel at the same speed in a vacuum, 3.0×10^8 m/s.

5. **compressions and rarefactions (a longitudinal wave)**

A vibrating source squeezes and stretches the air into compressions and rarefactions — a longitudinal wave.

6. **10 m/s**

$$v = f\lambda = 5.0 \times 2.0 = 10 \text{ m/s.}$$

7. **virtual, the same size, and as far behind the mirror as the object is in front**

A plane mirror gives a virtual image, the same size, the same distance behind the mirror — it cannot be caught on a screen.

8. **focal**

The focal length is the distance from the centre of the lens to the principal focus.

9. **False**

Sound needs particles to pass the vibration along, so it cannot travel through a vacuum.

10. **3 m**

$$\text{Rearrange } v = f\lambda: \lambda = \frac{v}{f} = \frac{330}{110} = 3.0 \text{ m.}$$