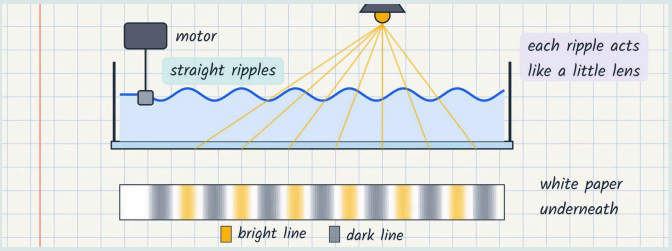
Ripple tank and string

Measuring waves in the lab

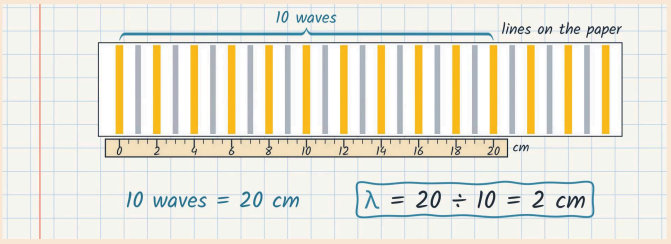
sansara academy
Summary sheet

1 Tank set-up



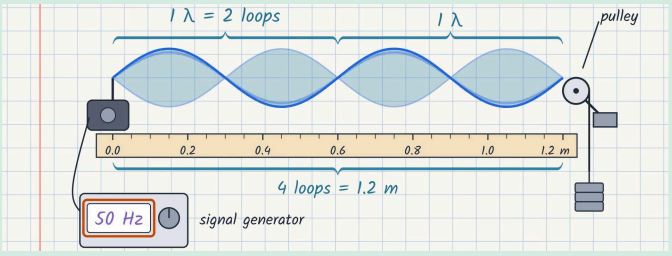
- A **ripple tank** is a shallow tray of water with a clear base. A motor moves a bar up and down to make **straight ripples**.
- A **lamp** above shines through the water: each ripple acts like a lens, so **bright and dark lines** appear on white paper below.

2 Tank readings



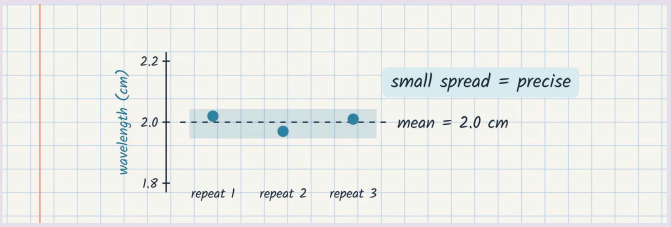
- **Wavelength**: measure across **10 waves** and divide by 10 (20 cm ÷ 10 = **2 cm**).
- **Frequency**: film the waves, play back slowly and count those passing a point (50 waves in 10 s = **5 Hz**). Then **v = f λ** = 5 × 0.02 = **0.1 m/s**.

3 The string



- Vibration generator → string → pulley → hanging mass. Change the frequency until the string shows **still loops** (a standing wave).
- **Each loop is half a wavelength**: 4 loops over 1.2 m = 2 λ, so **λ = 0.6 m**. Read **f = 50 Hz** off the signal generator: v = 50 × 0.6 = **30 m/s**.

4 Choosing apparatus



- Lamp: makes the waves visible. Video: slows them down to count. **Signal generator**: shows the frequency exactly, far more accurate than counting.
- Repeat each reading and take a **mean**. Repeats close together (a **small spread**) mean the results are **precise**.

$$v = f \lambda$$

wave speed = frequency × wavelength

Exam tip

Asked how to measure a wavelength? Say "measure across several waves, then divide by the number of waves".

Check yourself

1. 8 ripples cover 12 cm. What is the wavelength?
2. A string shows 6 loops over 1.5 m at 40 Hz. What is the wave speed?

Answers: 1. 12 ÷ 8 = 1.5 cm 2. 6 loops = 3 λ, so λ = 0.5 m; v = 40 × 0.5 = 20 m/s