Measuring wave speed in a ripple tank

Teacher / technician

YEAR 10 / LESSON 52 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. The task estimates v from fλ; it does not independently test that equation. Record actual measurements and retain raw timing and wavelength readings.

Coverage and delivery

Shared Physics / Double Award: 3.1, 3.3, 3.5–3.7. Wave speed and frequency–period relationships.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30; one staff tank, analysis in 15 pairs

Item	Per pair / setup	Class total
Complete tank, scale, camera and display	Staff demonstration	1 set
Absorbent cloths and spill tray	Staff station	1 set
Booklets and calculators	1 each per learner	30 of each

Immediate safety

Staff alone handle water and electrical setup. Keep mains equipment dry, raised and away from spills; use the tank's specified isolated low-voltage equipment. Switch off before adjustments. Mop up spills immediately. No flashing strobe is used.

Preparation and delivery

Read alongside the student method

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1. Pilot three clear recordings with steady depth, an in-plane scale and known timestamps. Keep reflected waves away from the measured region.

2. Provide the original recordings for paired analysis and check that playback timing is understood. If measurements cannot be resolved, report that limitation instead of inventing data.

Close of lesson

• Switch off and disconnect before draining. Dry the tank and bench and retain the recordings with the measurements.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- Eleven.
- It reduces the fractional uncertainty of locating individual crests.
- 0.030 m.
- 2.5 Hz.
- 0.075 m s^{-1}.
- Projection and screen magnification can change apparent distances.

References and provenance

Pearson Physics specification

IOP: reflection and refraction

IOP: basic ripple-tank experiments

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.