Sound frequency and oscilloscope traces

Teacher / technician

YEAR 11 / LESSON 65 / PHYSICS ONLY

Staff preparation and answer guidance. Keep separate from student sheets. Record actual measurements separately from labelled practice examples.

Coverage and delivery

Physics only: 3.24P, 3.26P–3.29P. Frequency, pitch, amplitude and loudness.

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

Requisition • class of 30 observing one staff setup

Item	Per pair / setup	Class total
Generator, speaker, microphone and scope	Staff demonstration	1 checked set
Booklets and calculators	1 each per learner	30 of each

Immediate safety

Use short, quiet tones and stop if anyone is uncomfortable. Keep speakers away from ears; no headphones, high-volume tests or sweeps to hearing limits. Offer silent trace analysis. Staff make all electrical connections using compatible low-voltage equipment.

Preparation and delivery

Read alongside the student method

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1. Pilot 250, 500 and 1000 Hz at comfortable low volume and capture readable traces in advance for silent participation.

2. Keep microphone position and gain fixed during the amplitude comparison. Do not ask pupils to disclose hearing ability.

Close of lesson

• Switch off sound promptly, disconnect equipment and retain trace 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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- It reduces fractional timing-readout uncertainty.
- 2.00 ms = 0.00200 s.
- 500 Hz.
- Frequency.
- It generally increases with other conditions fixed.
- No.

References and provenance

Pearson Physics specification

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.