Waves: motion of a disturbance

Teacher / technician

YEAR 10 / LESSON 51 / PHYSICS + SCIENCE (DOUBLE AWARD)

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

Coverage and delivery

Shared Physics / Double Award: 3.1–3.4. Transverse and longitudinal waves; wave quantities.

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

Requisition • class of 30 observing one controlled demonstration

Item	Per pair / setup	Class total
Spring and marker	Shared demonstration	1 of each
Booklets and rulers	1 each per learner	30 of each

Immediate safety

Check the spring for damage. Keep it on the surface, below face height, with secure holders and a clear sweep area. Use small motions; do not overstretch or release a stretched end. Keep fingers clear of closing coils.

Preparation and delivery

Read alongside the student method

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1. Pilot a visible low-amplitude motion on the available spring and mark the observer boundary. Demonstrate how holders return the spring to its relaxed length together.

2. Prepare labelled sketches as an equivalent observation route if the spring cannot be safely operated. No water tank, loudspeaker or strobe is required.

Close of lesson

• Relax the spring slowly with both ends controlled, remove the marker and store without kinking.

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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- The disturbance and energy.
- No; it oscillates about its resting position.
- Perpendicular to wave travel.
- Parallel to wave travel.
- Maximum displacement from equilibrium.
- Frequency is cycles per second; period is time per cycle.

References and provenance

Pearson Physics specification

IOP: reflection and refraction

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.