Particles and internal energy

Teacher / technician

YEAR 11 / LESSON 68 / 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: 5.8P–5.10P. Particle arrangement, motion and changes of state.

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

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklets	1 per learner	30
Large particle counters	12 per pair	180

Immediate safety

Use large counters on the desk; do not place them in mouths or throw them. No heating, boiling water or particle sprays are used.

Preparation and delivery

Read alongside the student method

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1. Prepare 15 sets of 12 counters and require the same count in each state model.

2. Use separate arrows for energy transfer and particle motion. Distinguish intermolecular separation from breaking atoms apart.

Close of lesson

- Count and return counters; retain the corrected diagrams.

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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- They vibrate about fixed positions in the simple model.
- Particles can rearrange while remaining close together.
- No.
- Energy changes the particle arrangement and potential energy rather than increasing average kinetic energy.
- Evaporation is a surface process possible below boiling; boiling occurs throughout at the boiling temperature for that pressure.
- No; it depends on the amount and state of matter as well as temperature.

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.