Pressure and temperature at fixed volume

Teacher / technician

YEAR 11 / LESSON 78 / 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: 5.20, 5.21. Fixed-volume gas; $p_1/T_1 = p_2/T_2$.

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 and graph paper	1 each per learner	30 of each
Calculator and ruler	1 set per pair	15 sets

Immediate safety

Desk-based data work only. Never heat a sealed container for this activity. No flame, hot-water bath or pressurised apparatus is used.

Preparation and delivery

Read alongside the student method

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1. Label the data as ideal and invented. Keep absolute pressure and kelvin temperature explicit in headings.

2. Discuss the extrapolation limit without requiring pupils to perform extreme-temperature experiments.

Close of lesson

• Retain graphs and corrected calculations.

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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- Amount of gas and volume.
- Molecules have greater average speed and transfer momentum to the walls at a greater rate.
- 0.32 kPa K^{-1}.
- 360 K.
- 120 kPa absolute.
- The ideal-gas assumptions fail, including condensation before that limit.

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.