Boyle’s law: pressure and volume

Teacher / technician

YEAR 11 / LESSON 77 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. All data are invented ideal examples; no real pressure measurements are claimed.

Coverage and delivery

Shared Physics / Double Award: 5.20, 5.22. Fixed gas mass at constant temperature; $p_1V_1 = p_2V_2$.

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
Ruler and calculator	1 set per pair	15 sets

Immediate safety

Paper-based data analysis. No sealed syringes, compressed-gas cylinders, weights on pistons or pressure vessels are operated.

Preparation and delivery

Read alongside the student method

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1. Prepare the exact labelled ideal data and emphasise absolute pressure.

2. Check reciprocal-volume axis units and require the constant-temperature assumption in every prediction.

Close of lesson

• Keep graphs with the stated assumptions and return calculators.

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 temperature.
- 6000 kPa cm^3.
- It doubles in the ideal constant-temperature model.
- p against 1/V.
- About 133 kPa absolute.
- The relation requires pressure measured relative to vacuum.

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.