Fusion in stars: energy and balance

Teacher / technician

YEAR 11 / LESSON 104 / 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: 7.17, 7.25–7.26. Stellar fusion and electrostatic repulsion.

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 star diagrams	1 each per learner	30 of each
Pencil sets	1 per pair	15 sets

Immediate safety

Diagram lesson only. No flames, plasma lamps, pressure vessels or solar viewing are used. Never look directly at the Sun.

Preparation and delivery

Read alongside the student method

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1. Use separate core and surface labels and explain the limited school collision model.

2. Distinguish pressure support from a literal outward fusion force and avoid a combustion analogy.

Close of lesson

• Retain labelled diagrams and collect pencils.

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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- Nuclear fusion, converting hydrogen overall into helium.
- They have positive electric charge.
- It increases particle kinetic energies and the chance of close encounters.
- It increases the number of encounters.
- In the hot dense core.
- No; it is predominantly nuclear energy.

References and provenance

Pearson Physics specification

NASA: stars

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.