Advanced moments: sharing a beam’s load

Teacher / technician

YEAR 10 / LESSON 12 / 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: 1.32P, 1.33P. Support forces and moments.

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
Booklet and graph paper	1 of each per learner	30 of each
Diagram card sets	1 per pair	15 sets
Rulers/calculators	1 of each per pair	15 of each

Immediate safety

Paper modelling only. Do not stand on rulers, benches or improvised beams to test the model.

Preparation and delivery

Read alongside the student method

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1. Provide 15 diagram sets and 30 booklets/graph sheets. Label the initial beam as light and its length as 1.0 m.

2. Keep the 4 N beam-weight extension separate from the first table; check that pupils change the total vertical force to 24 N.

Close of lesson

- Return cards and keep corrected diagrams and 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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- 4 N upward.
- 16 N upward.
- Each reaction is 10 N for the light-beam model.
- The sum A + B remains 20 N.
- Its central weight has symmetric support contributions.
- No; material strength, geometry, loading and other engineering factors are omitted.

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.