Balancing moments: a metre rule

Teacher / technician

YEAR 10 / LESSON 11 / 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: 1.30P, 1.32P. Quantitative moments and equilibrium.

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

Requisition • class of 30, ten groups of three

Item	Per pair / setup	Class total
Rule/pivot/hooks/tray set	1 per group	10 sets
Approved small mass set	1 per group	10 sets
Balance	Shared	2
Booklets	1 per learner	30

Immediate safety

Keep rules and loads low above padded trays. Do not balance on sharp blades or overload hooks. Add and remove masses while supporting the rule; keep hands clear of the pivot and never launch a mass.

Preparation and delivery

Read alongside the student method

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1. Arrange ten groups of three. Check rules, hooks and pivots; select small loads within their ratings and supply only that set.

2. Find each rule's approximate unloaded balance point before class. Account for hook mass and use actual distances from the chosen pivot.

Close of lesson

• Support the rule, remove all loads and count masses before returning apparatus.

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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- To avoid an unaccounted moment from the rule’s weight.
- 0.196 N m.
- 0.10 m on the opposite side.
- Their weight contributes to the moment.
- No; the resultant force and moment are zero, but individual forces remain.
- Pivot friction, reading the scale, finite hook width and mass uncertainty.

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.