Motor effect: predicting force direction

Teacher / technician

YEAR 11 / LESSON 82 / 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: 6.12–6.14. Force on a current-carrying conductor and Fleming's left-hand rule. Physics-only extension: 6.11P moving charge.

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	1 per learner	30
Direction cards and rulers	1 set per pair	15 sets

Immediate safety

Desk-based direction models only. No electron-beam tube, high-voltage supply, high-current wire or strong magnet is operated.

Preparation and delivery

Read alongside the student method

YEAR 11 / LESSON 82 / PHYSICS + SCIENCE (DOUBLE AWARD)

1. Prepare consistent dot/cross notation and the specified orientation before distributing cards.

2. Check the hand rule against the labelled starting diagram. Keep the moving-charge extension distinct from shared-course content.

Close of lesson

- Retain corrected diagrams and collect cards.

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

YEAR 11 / LESSON 82 / PHYSICS + SCIENCE (DOUBLE AWARD)

- Upwards on the page.
- Downwards.
- The force stays upwards.
- The magnetic force is zero in this model.
- Its magnitude increases.
- Their magnetic forces point in opposite directions for the same velocity and field.

References and provenance

Pearson Physics specification

IOP: electromagnetism

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.