



ELECTRIC AFRICA OFFLINE INVESTIGATION

Magnetic Field Explorer

S1-S4 | Physics | 50-65 minutes

Use a compass and field-line model to connect current direction, poles and field strength.

BEFORE YOU TEST

Predict

What happens to a nearby compass when current direction in a coil reverses?

SAFETY RULE

Keep magnets away from phones, bank cards and medical devices.



SIMULATION RECORD

Change one variable

Keep all other settings constant. Record a prediction, measurement and observation for each trial.

- 1 Current direction: forward or reverse
- 2 Current size: low to higher
- 3 Distance from coil
- 4 Observe: compass direction and field pattern

INVESTIGATION TABLE

Trial	Variable value	Prediction	Measurement	Observation
1				
2				
3				
4				



HANDS-ON EXTENSION

Build safely

Keep magnets away from phones, bank cards and medical devices.

Materials

- 1 Classroom bar magnet
- 2 Small compass
- 3 Paper
- 4 Pencil
- 5 Tape

Method

- 1 Tape the magnet beneath paper.
- 2 Mark compass direction at several positions.
- 3 Join arrows into smooth field curves.
- 4 Identify where the field appears strongest.



EXPLAIN AND ASSESS

Turn results into evidence

Explain what the compass shows and why reversing current reverses the field.

Learner explanation

Teacher rubric - score each criterion 0-4

Observation	Accurate, relevant observations	Score: ____ / 4
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Variable control	One variable changed fairly	Score: ____ / 4
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Evidence	Measurements support the claim	Score: ____ / 4
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Explanation	Scientific reasoning links cause and result	Score: ____ / 4
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Certificate threshold: 12/16 plus independent moderation in the school pilot.