



ELECTRIC AFRICA OFFLINE INVESTIGATION

Electric Generator

S5-S6 | Physics | 60-80 minutes

Connect changing magnetic flux with induced voltage, frequency and useful electrical power.

BEFORE YOU TEST

Predict

How will the voltage waveform change when the coil rotates twice as fast?

SAFETY RULE

Use a sealed classroom generator and LED only. Never connect it to mains wiring or batteries.



SIMULATION RECORD

Change one variable

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

- 1 Rotation speed
- 2 Magnetic field strength
- 3 Number of coil turns
- 4 Measure: peak voltage and frequency

INVESTIGATION TABLE

Trial	Variable value	Prediction	Measurement	Observation
1				
2				
3				
4				



HANDS-ON EXTENSION

Build safely

Use a sealed classroom generator and LED only. Never connect it to mains wiring or batteries.

Materials

- 1 Sealed hand-crank generator
- 2 Protected LED module
- 3 Timer
- 4 Observation sheet

Method

- 1 Turn the handle slowly and observe the LED.
- 2 Double the turning rate for the same time.
- 3 Compare brightness without exceeding kit limits.
- 4 Connect speed with mechanical energy input.



EXPLAIN AND ASSESS

Turn results into evidence

Explain how changing magnetic flux produces alternating voltage.

Learner explanation

Teacher rubric - score each criterion 0-4

Observation	Accurate, relevant observations	Score: ____ / 4
--------------------	---------------------------------	-----------------

Variable control	One variable changed fairly	Score: ____ / 4
-------------------------	-----------------------------	-----------------

Evidence	Measurements support the claim	Score: ____ / 4
-----------------	--------------------------------	-----------------

Explanation	Scientific reasoning links cause and result	Score: ____ / 4
--------------------	---	-----------------

Certificate threshold: 12/16 plus independent moderation in the school pilot.