

Foil Circuit Investigation — Planning a Fair Test

A4-PHYS practical summative · 25% due: End of Component 4 (around Lesson 12)

Summative planned investigation for the Physical sciences strand, modelled on the SCSA 'Foil circuit investigation' sample task. Students plan a fair test using foil-ribbon circuits: choose one variable to change, list controlled variables, state what they will measure, draw a labelled circuit, design a recording table, and make a reasoned prediction. Completed individually (~3 lessons of preparation, one to write the plan). Assesses ULO4 (electrical circuits), ULO5 (questioning/planning) and ULO6 (representing data). Weighting is a school convention (25% of four equally weighted summatives), not mandated by the syllabus.

Task

Aluminium foil is a **conductor**, so a foil ribbon can replace wire in an **electrical circuit**. In this task you will plan a **fair test** to find out how changing one thing about the foil affects the circuit. You are planning the investigation — you do not have to run it to complete this task.

Equipment available to plan with: aluminium foil (three brands), wooden pegs, paper clips, bulldog clips, sticky tape, 5-volt globes, and AAA / AA / D cells (new and fully charged).

1. Variables

1a. What is the **one variable** you will change?

1b. What will you **measure**, and how will you measure it?

1c. List the **controlled variables** — the things you will keep the same to make it a fair test.

2. Aim

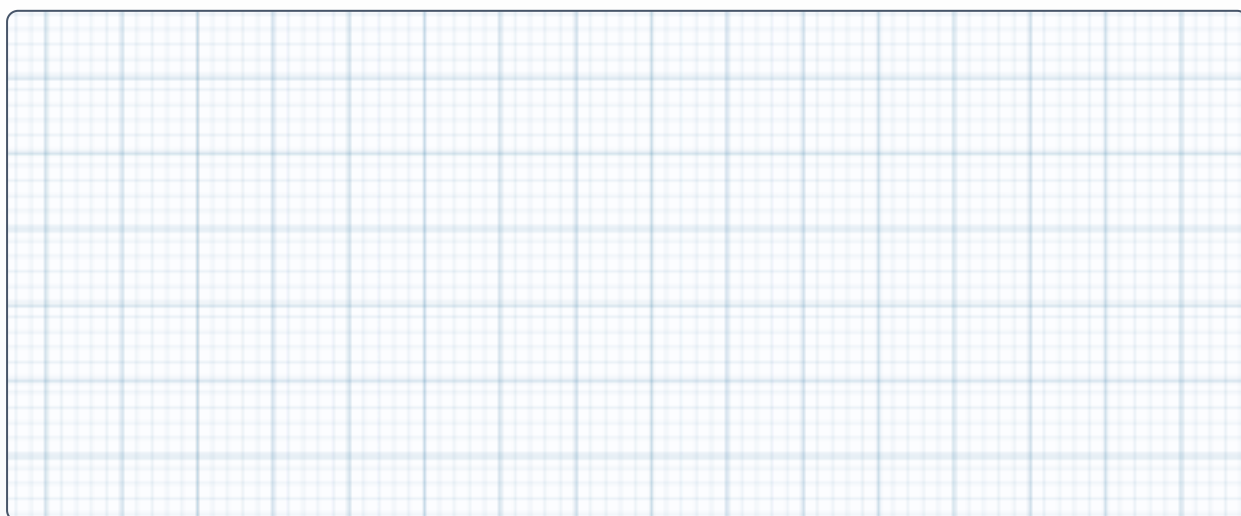
2. What are you trying to find out?

3. Risks

3. Could anyone get hurt doing this activity? Describe the risks and how you would reduce them.

4. Labelled diagram

4. Draw a labelled diagram of your equipment set-up. Use the correct circuit symbols for the cell, globe and switch.



5. Recording table

5. Design a table you could use to record your results. Include headings and units.

6. Prediction

6. Write a **prediction**: what do you think will happen, and **why**? Use what you know about how electrical energy is transferred in a circuit.

Rubric criteria (weights as a percentage of this assessment)

Criterion	Weight	Descriptor
Diagram, recording method and prediction (Q4–6)	43%	High (6): Draws a clearly labelled, correct electrical circuit; proposes a plausible recording method using units of measure; and makes a valid prediction based on scientific knowledge of electrical circuits. Sound (4): Draws a mostly correct circuit; proposes a simple recording method with correct units; communicates a prediction showing some understanding of electrical energy. Limited (2): Draws a simple diagram; uses a simple table (units may be incorrect); communicates a simple prediction about energy in a circuit.
Variables and fair-test design (Q1–2)	36%	High (4–5): Identifies in detail the relationship between variables; clearly explains what will stay the same; and specifies how the variable will be changed and measured. Sound (2–3): Identifies simple relationships; identifies the variable to be changed and what will be measured. Limited (0–1): Follows a procedure to develop a question that may or may not correctly identify a variable; with guidance, identifies a variable to measure.
Identifying and managing risk (Q3)	21%	High (3): Describes safety risks and suggests ways to improve procedures to minimise risk. Sound (2): Describes safety risks. Limited (1): Lists some safety risks.