

11.2 Simple Circuits

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

Build the skills to answer exam questions on **simple circuits**.

You must be able to:

- identify the parts of a **circuit** 电路—source, wires, resistor, switch—and their symbols
- describe how a **battery** 电池 maintains a potential difference that drives the current
- trace a complete conducting loop and explain why a break stops the current

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Circuit parts

A simple circuit has a **source** (cell or battery), **wires**, a **resistor** or bulb, and often a **switch**—each with its own symbol.

■ What the battery does

The battery maintains a **potential difference** across the circuit, which drives the current around the loop.

■ A complete loop

Current flows only around an **unbroken** conducting loop. An open switch (a break) stops the current everywhere.

2 Practice

2.1 Name the component that drives the current around a circuit. [1]

2.2 State what happens to the current when the switch is opened. [1]

2.3 Describe a simple series circuit containing a battery, a switch, and a resistor. [2]

3 Exam-style questions

3.1 A battery in a circuit provides [1]

- **A** resistance
 - **B** a potential difference
 - **C** a store of current
 - **D** a magnetic field
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3.2 Current flows in a circuit only when the loop is [1]

- **A** broken
 - **B** complete
 - **C** very long
 - **D** at high temperature
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3.3 A torch contains a cell, a switch, and a bulb.

(a) State what the cell does in the circuit. [1]

(b) Explain why the bulb goes out when the switch is opened. [2]

4 Go further

- work through the **11.2 Simple Circuits** lesson on the **Learn** page;
- read the **Electric Circuits** section of the AP Physics 2 handout on the **Know** page.

Solutions

2.1 the battery (or cell).

2.2 the current stops (the loop is broken).

2.3 the battery, switch, and resistor are connected in one loop by wires, so the same current flows through each in turn.

3.1 B.

3.2 B.

3.3 (a) it maintains a potential difference that drives the current. (b) opening the switch breaks the loop, so no current can flow and the bulb goes out.