

Exercise walk-through

11.2

Electric Circuits

AP Physics C: Electricity and Magnetism

You must be able to

- identify the components of a circuit: **source of emf**, resistors, wires, switches
- distinguish an **open**, a **closed**, and a **short circuit**
- describe an **ideal battery** as a source of constant potential difference
- state how **ammeters** and **voltmeters** are connected

1

The method

Method — Components

A source of emf, resistors, connecting wires, and switches – each with a standard schematic symbol.

Exercises 2.1-2.3

2.1 State how an ammeter is connected in a circuit.

[1]

2.2 State how a voltmeter is connected.

[1]

2.3 State the difference between an open and a closed circuit.

[2]

Exercises 2.1-2.3

2.1 State how an ammeter is connected in a circuit. [1]

2.1

- in series
-

2.2 State how a voltmeter is connected. [1]

2.2

- in parallel with the component
-

2.3 State the difference between an open and a closed circuit. [2]

2.3

- a closed circuit is a complete loop that carries current; an open circuit is broken, so no current flows

Exercises 3.1-3.2

3.1 An ammeter is connected in

[1]

☐

A series

B parallel

C either way

D neither way

3.2 A short circuit is a path of

[1]

☐

A very high resistance

B very low resistance

C no current at all

D infinite voltage

Exercises 3.1-3.2

3.1 An ammeter is connected in

[1]

☐

A series

B parallel

C either way

D neither way

3.1 A

- series.

3.2 A short circuit is a path of

[1]

☐

A very high resistance

B very low resistance

C no current at all

D infinite voltage

3.2 B

- very low resistance.

Exercise 3.3 (a)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(a) State how the ammeter is connected.

[1]

Exercise 3.3 (a)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(a) State how the ammeter is connected. [1]

(a)

- in series

Exercise 3.3 (b)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(b) State how the voltmeter is connected.

[1]

Exercise 3.3 (b)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(b) State how the voltmeter is connected. [1]

(b)

- in parallel with the resistor

Exercise 3.3 (c)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(c) Explain why a voltmeter should have a very high resistance.

[1]



battery



resistor



ammeter



voltmeter

Exercise 3.3 (c)

3.3 A circuit has a battery, a resistor, an ammeter, and a voltmeter across the resistor.

(c) Explain why a voltmeter should have a very high resistance.

[1]



battery



resistor



ammeter



voltmeter

(c)

- so it draws almost no current and does not disturb the circuit it measures