

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ recognise and draw standard component symbols
- ☐ use Ohm's law and the power formulae
- ☐ calculate total resistance of series and parallel resistors
- ☐ show where an ammeter (series) and voltmeter (parallel) are connected
- ☐ describe advantages of simulating a circuit before building it

I DO**Worked example**

Read how a full-mark answer is built

*A pupil wants to simulate a circuit before building it.***1 Explain one advantage of simulating the circuit before constructing it.** (2 marks)**Full-mark answer** each ✓ is one mark

Faults in the circuit can be found and corrected on screen before it is built ✓, so no components are damaged or wasted ✓.

Why marks are not awarded*"It is cheaper and it is quicker."*

0 marks: two vague benefits, no cause and effect.

WE DO**Guided practice**

Use the starters and word bank to help you

*Two 470 Ω resistors are connected in parallel.***2 Calculate the total resistance.** (2 marks)**Sentence starters**

One ... is ..., which means ...
Another ... is ..., so ...

Word bank

Tip: 2 marks = 2 separate, developed points.

YOU DO**On your own** No notes. Check your answers afterwards.**3 Quick check: tick one box for each.**

- a) Two 1 k Ω resistors in parallel have a total resistance of...
☐ 2 k Ω ☐ 1 k Ω ☐ 250 Ω ☐ 500 Ω
- b) In a series circuit with 9 V supply, $V_1 = 3.5$ V and $V_2 = 2.5$ V. V_3 is...
☐ 3 V ☐ 6 V ☐ 15 V ☐ 2.5 V
- c) 12 V across 680 Ω gives a current of about...
☐ 0.018 A ☐ 56 A ☐ 8160 A ☐ 1.8 A
- d) UK mains electricity is...
☐ 12 V d.c. ☐ 230 V d.c. ☐ 230 V a.c. ☐ 110 V d.c.

4 Key terms: write the letter of the matching description next to each term.

1. Conventional current	_____	A $R = (V_s - V_{LED}) \div I$
2. Kirchhoff's first law	_____	B Flows from + to – (electrons flow the other way).
3. Kirchhoff's second law	_____	C No current until the switch is operated (push-to-make).
4. LED series resistor	_____	D Limit switch with C, NO and NC terminals; detects position.
5. Microswitch	_____	E Voltages round a series loop add up to the supply.
6. Normally open (NO)	_____	F Currents into a junction = currents out: $I_T = I_1 + I_2 + \dots$

A 12 V lamp draws 0.5 A.

5 Calculate the power of the lamp. (2 marks)

An ammeter is needed to measure the current through a lamp.

6 Draw the symbol for an ammeter and state how it is connected. (2 marks)

In a series circuit with R_1 and R_2 , R_1 is increased.

7 State the effect on V_1 and on the current. (2 marks)

Check and reflect

Mark your answers with the answer sheet. Go back to the checklist on the site and re-rate each “I can” statement above. Which one still needs work?
