

Potential Difference

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

Two 1.5 V cells are joined in series, facing the same way. What is the total p.d.?

Step 1 · Cells in series

Their potential differences add up.

Step 2 · Calculate

$$1.5 + 1.5 = 3 \text{ V.}$$

Answer: 3 V

Check: If one cell faced the other way, they would cancel: 0 V.

2. Now try one with the steps

A 6 V battery runs two bulbs in series. Bulb 1 has 4 V across it. What is across bulb 2?

Step 1 · Series rule

Step 2 · Calculate

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What is the unit of potential difference? [1]

2. How is a voltmeter connected to measure the p.d. across a bulb? [1]

3. What does potential difference measure? [1]

4. Two 1.5 V cells are in series, facing the same way. What is the total p.d., in V? [1]

5. A 6 V battery runs two bulbs in series. Bulb 1 has 4 V across it. What is the p.d. across bulb 2, in V? [1]
-
-
6. Two identical bulbs are in series with a 12 V supply. What is the p.d. across each bulb, in V? [1]
-
-
7. Two bulbs are in parallel with a 9 V supply. What is the p.d. across each, in V? [1]
-
-
8. Three identical bulbs are in series with a 9 V battery. What is the p.d. across each, in V? [1]
-
-
9. Three 1.5 V cells are joined in series, but one is put in backwards. What is the total p.d., in V? [2]
-
-
10. Why does a bulb glow more brightly with a 6 V battery than with a 3 V battery? [2]
-
-
11. In a 6 V series circuit, A has twice the resistance of B. What is the p.d. across A, in V? [2]
-
-
12. What is the p.d. of the UK mains supply, in V? [1]
-
-
13. Explain why lights in a house are wired in parallel. [2]
-
-
14. A voltmeter is connected across a closed switch in a working circuit. What does it read, in V, and why? [2]
-
-

4. Before you hand it in

Connecting the voltmeter in series.

Connect its leads across the component, in parallel.

"Voltage flows round the circuit."

Say 'the p.d. across the bulb' and 'the current through the bulb'.

Thinking each series bulb gets the full battery p.d.

In series, the component p.d.s add up to the supply p.d.