

Reading ammeters and voltmeters in circuits

Grade 7 science (Year 8 · Class 7) · Test

Name: _____ Date: _____ Class: _____ Mark: ____ / 20

This test checks how to use ammeters and voltmeters and how to apply the rules for current and voltage in series and parallel circuits. You have 45 minutes and 20 marks. Write units with every answer and give reasons where the question says explain.

Level: Grade 7 science (Year 8 · Class 7) · **Curriculum:** MS-PS2-3

Time: 45 minutes · 8 questions · Total: 20 marks · Calculator allowed

Question 1 Using meters (3 marks)

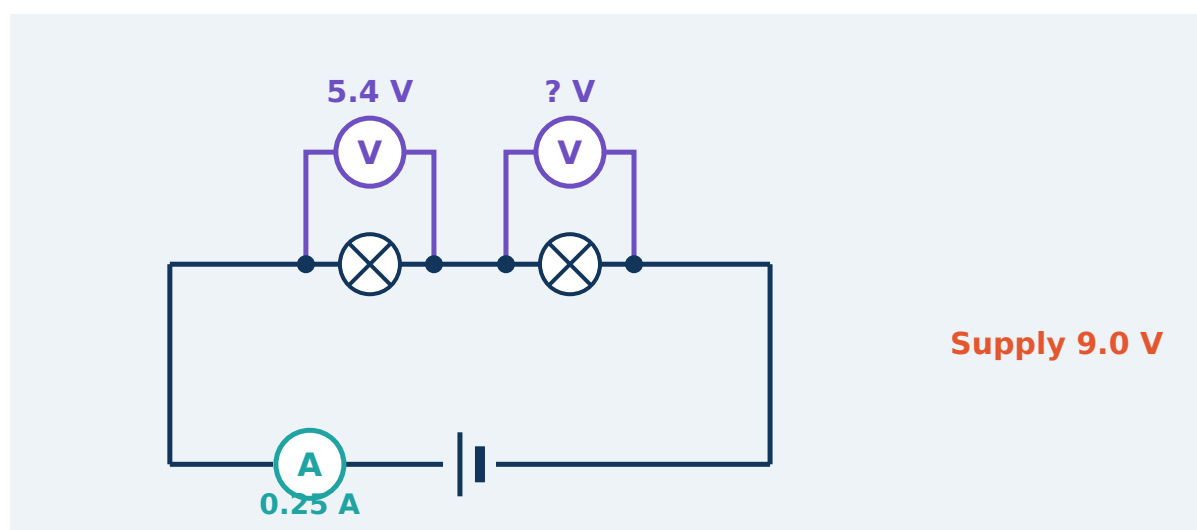
- State what an ammeter measures and its unit. (1 mark)
- Describe how an ammeter is connected. (1 mark)
- Describe how a voltmeter is connected. (1 mark)

Question 2 Converting (2 marks)

- Convert 480 mA into amperes. (1 mark)
- Convert 1.25 A into milliamperes. (1 mark)

Question 3 A series circuit (3 marks)

Look at the series circuit in the figure.



A series circuit with an ammeter and two voltmeters.

- a. Calculate the voltage across bulb 2. (1 mark)
- b. State the reading of an ammeter placed after bulb 2. (1 mark)
- c. Explain your answer to part b. (1 mark)

Question 4 A parallel circuit (3 marks)

In a parallel circuit, the main ammeter reads 1.00 A and the ammeter in branch 1 reads 0.65 A. The supply is 6.0 V.

- a. Calculate the current in branch 2. (1 mark)
- b. State the voltage across branch 2. (1 mark)
- c. State the main current if branch 2 is disconnected. (1 mark)

Question 5 Ammeter across a lamp (2 marks)

Nia in Cape Town connects an ammeter across a lamp. Predict what happens to the lamp and explain why. (2 marks)

Question 6 Current in a series loop (2 marks)

A student says that the current gets smaller after each bulb in a series circuit because the bulbs use it up. Explain why the student is wrong. (2 marks)

Question 7 Overloading a socket (3 marks)

Three appliances are plugged in parallel into one extension lead. They draw 0.30 A, 0.45 A and 0.60 A. The lead has a 1.0 A fuse.

- a. Calculate the total current. (1 mark)
- b. Explain whether the fuse will blow. (1 mark)
- c. State which single appliance could be removed so that the fuse does not blow. (1 mark)

Question 8 Water analogy (2 marks)

Use the idea of water in pipes to explain the difference between current and voltage. (2 marks)