I–V characteristics and sensors

Name _____ Class _____ Date _____

Different components behave differently when the potential difference across them changes. An **I–V graph** shows how.

KEY IDEAS

- **Ohmic conductor** (resistor at constant temperature): straight line through the origin; current ∝ p.d.
- **Filament lamp**: curve that gets less steep, because resistance increases as the filament gets hotter.
- **Diode**: current flows in one direction only. **Thermistor**: R falls as temperature rises. **LDR**: R falls as light gets brighter.

CIRCUIT SYMBOLS



Section A · Recall

Grade 4–5

1 Which component has a resistance that decreases as the temperature increases? [1]

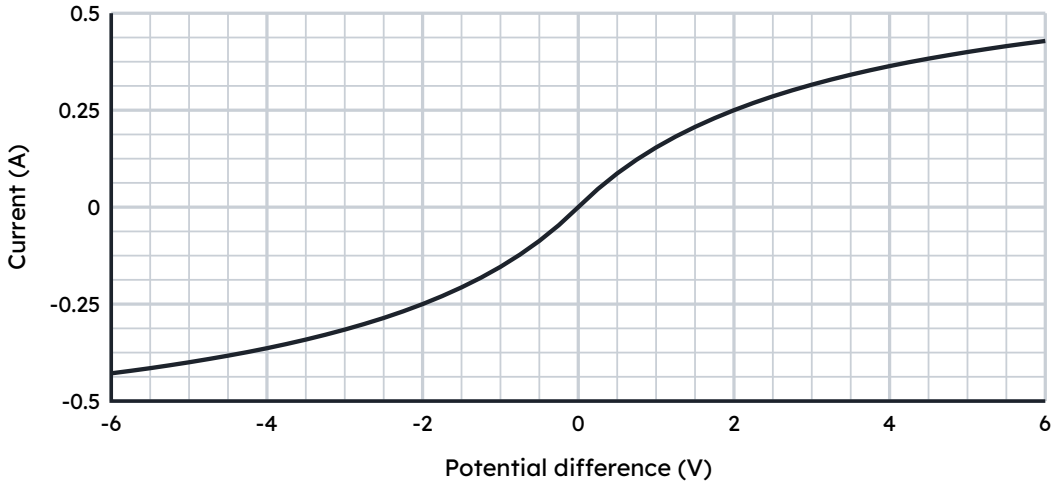
2 Give one use of a thermistor and one use of an LDR. [2]

3 Describe how the current through a diode depends on the direction of the p.d. [2]

Section B · Interpret the graph

Grade 5–6

4 The graph shows the I–V characteristic of a filament lamp.



a Use the graph to find the current when the p.d. is 4 V. [1]

b Calculate the resistance of the lamp at 4 V. [2]

c Explain why the graph gets less steep as the p.d. increases. [3]

Section C · Stretch

Grade 7+

5 Explain how a thermistor could be used to switch on a heater when a room gets cold. [3]

Exam-style question

AQA style

6 A student wants to find the I–V characteristic of a resistor.

a Describe a method the student could use. [4]

b Describe and explain the shape of the graph the student should get. [2]

Total: _____ / 20

How confident am I?	Not yet	Nearly	Got it
I can sketch I–V graphs for a resistor, lamp and diode	☐	☐	☐
I can explain how thermistors and LDRs behave	☐	☐	☐
I can describe the I–V practical	☐	☐	☐