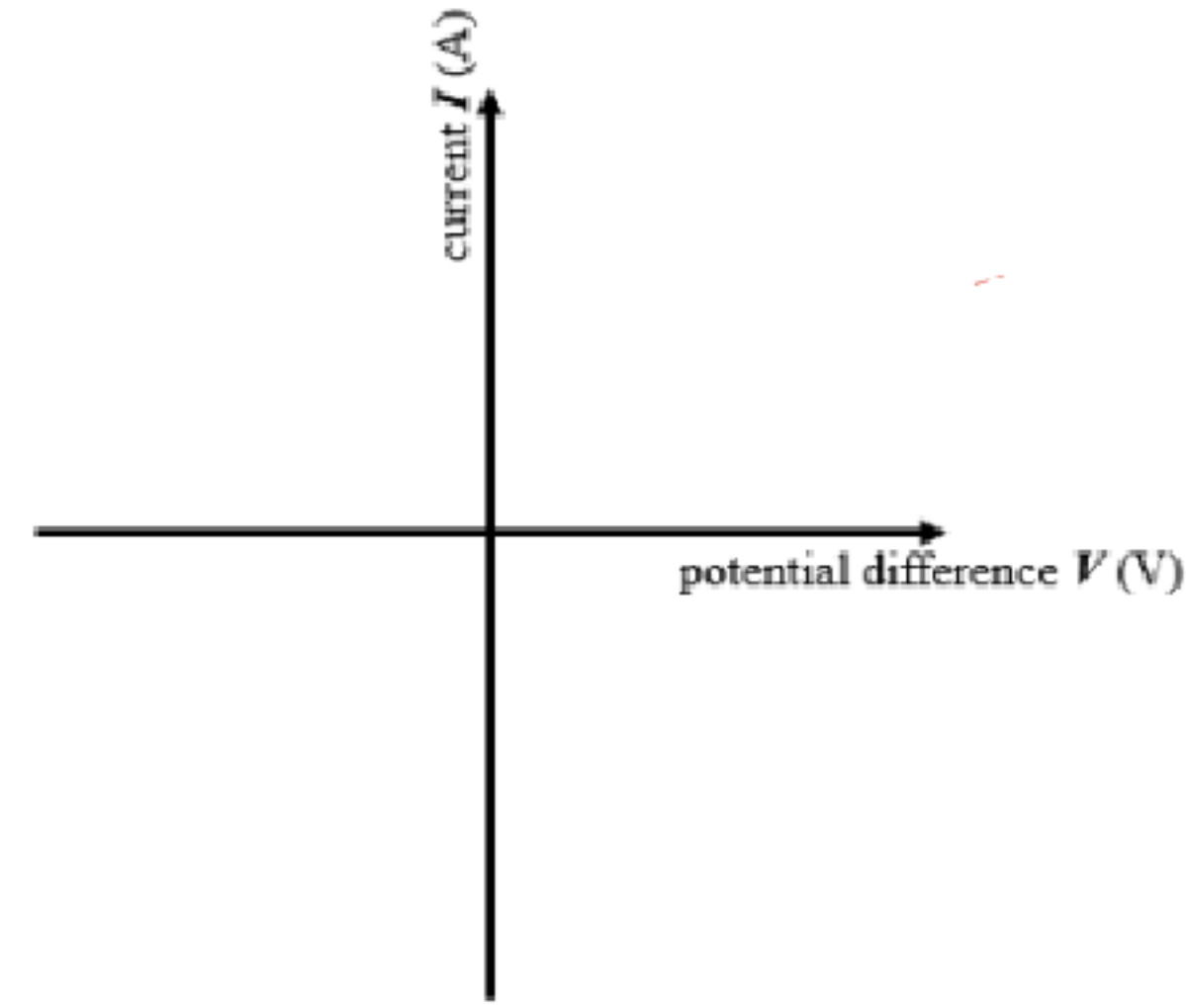
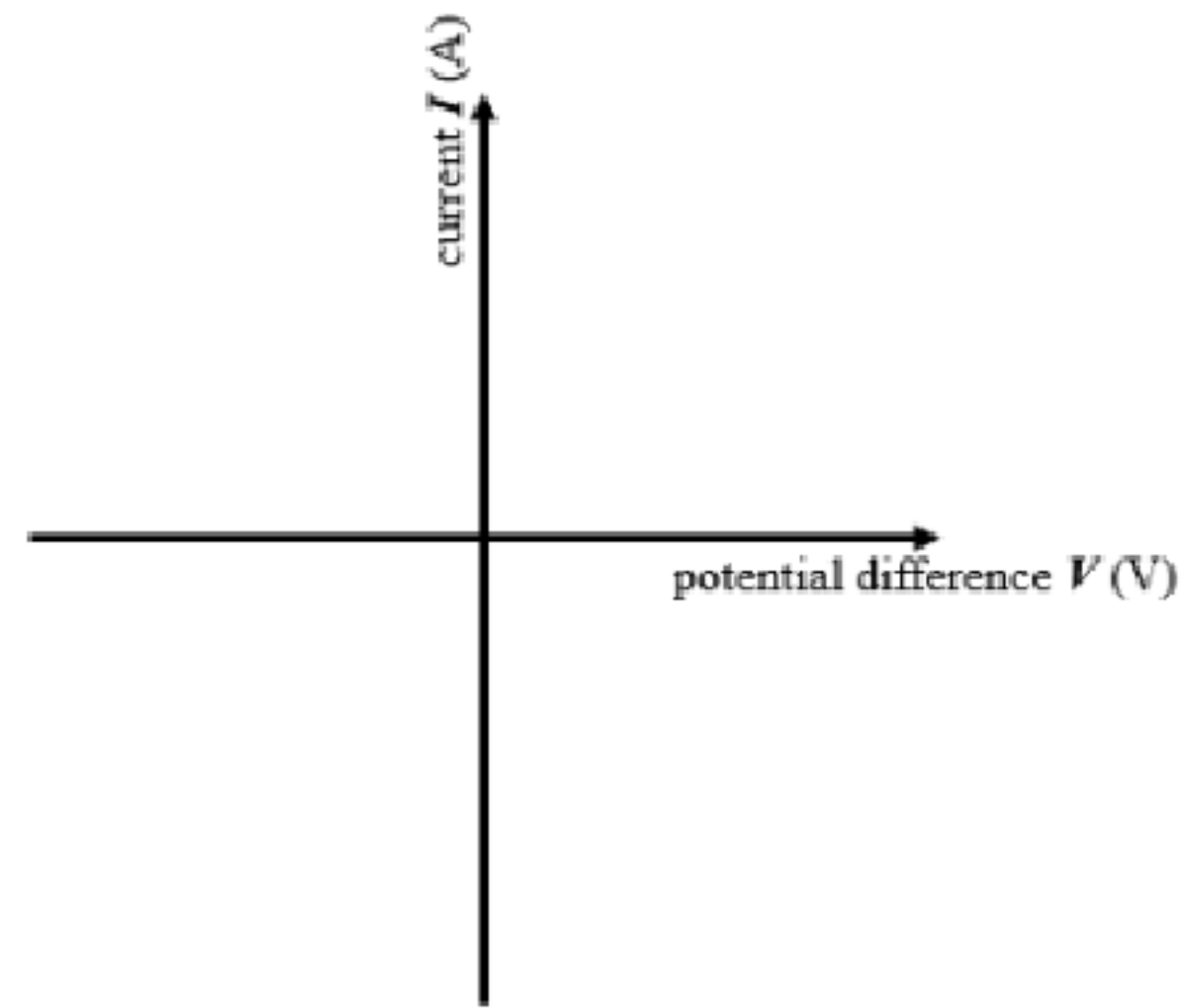
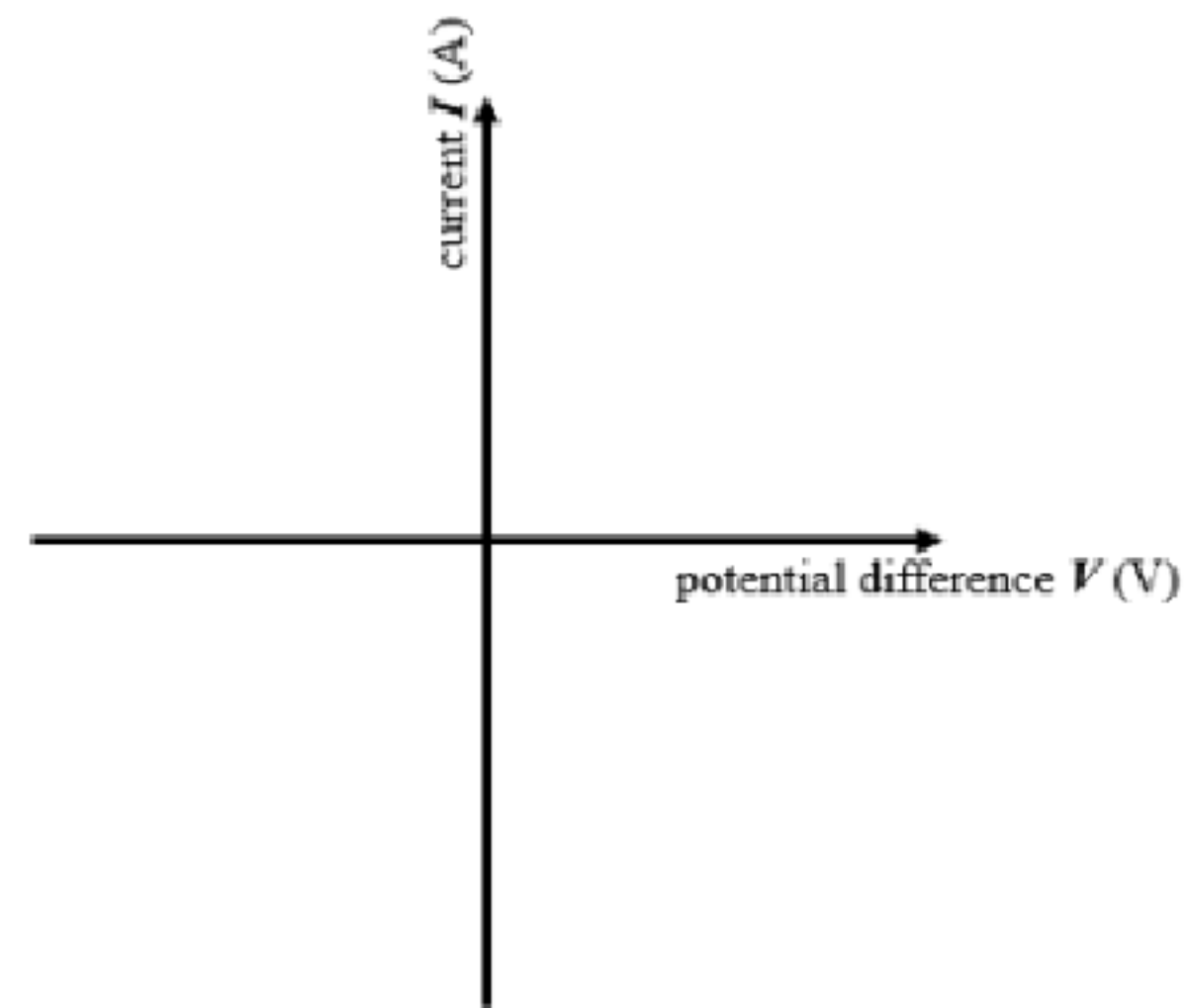


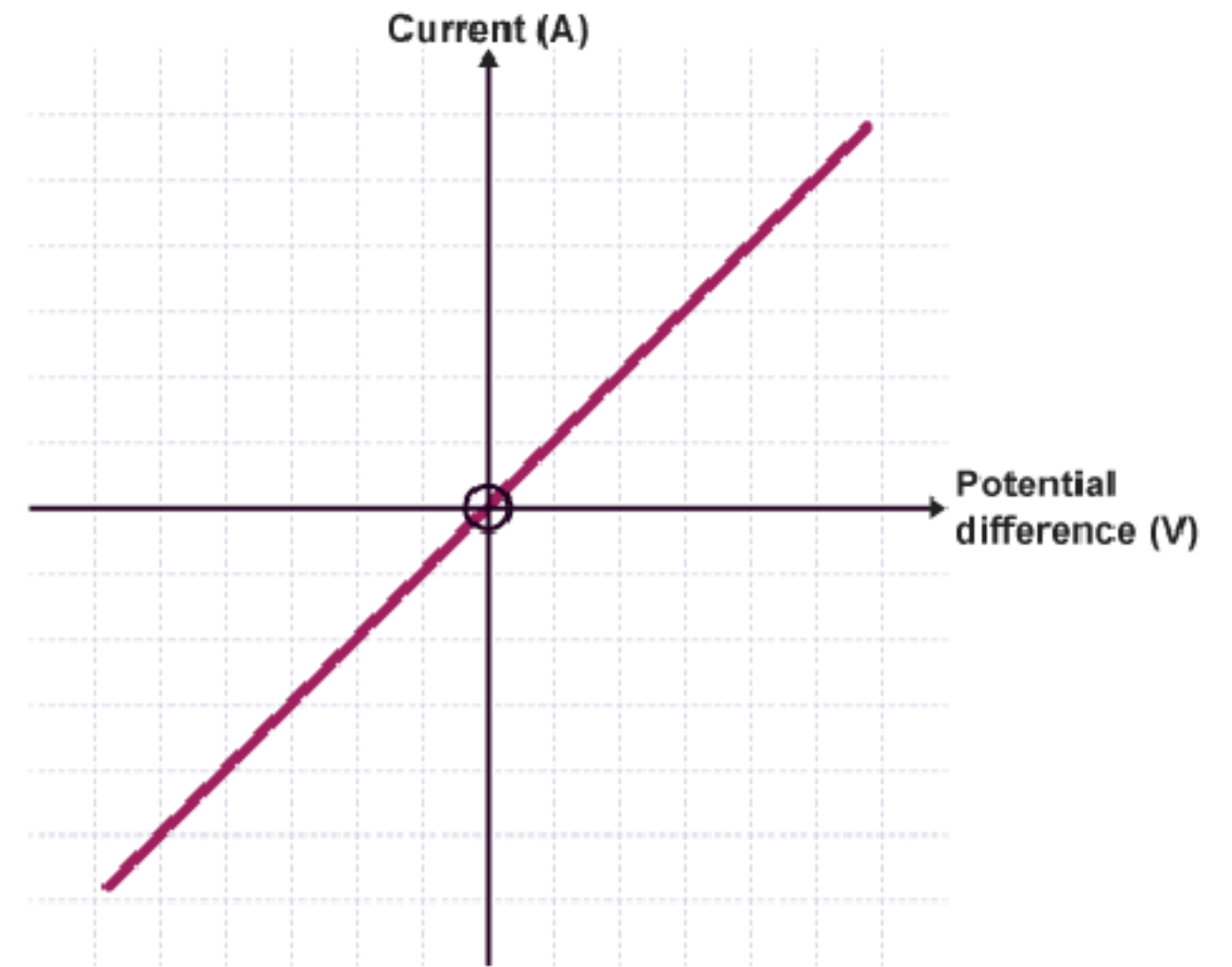
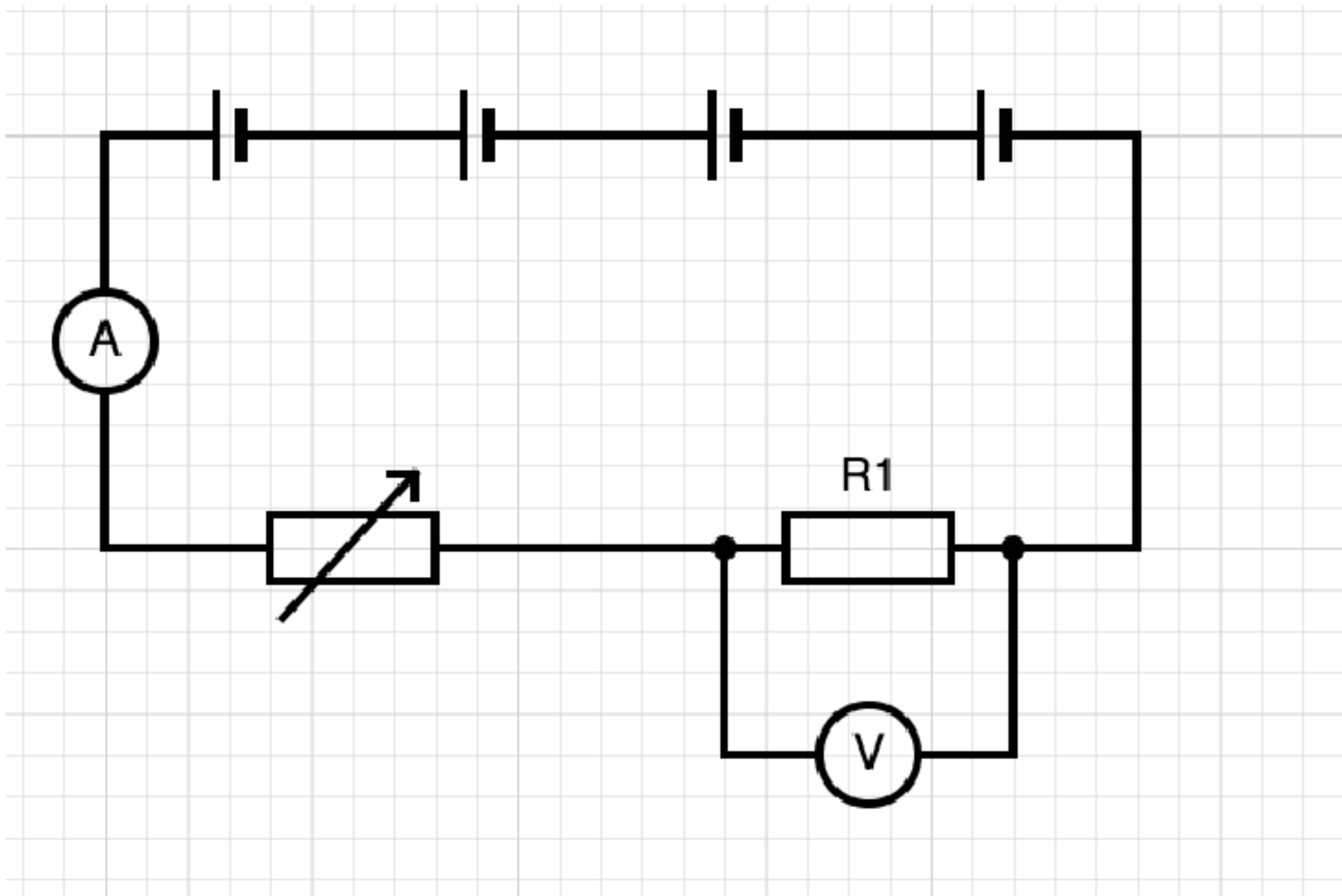
# IV characteristics

## What are 'IV characteristics'?

IV characteristics are graphs of current (y-axis) against potential difference (x-axis). There are three that you need to know.



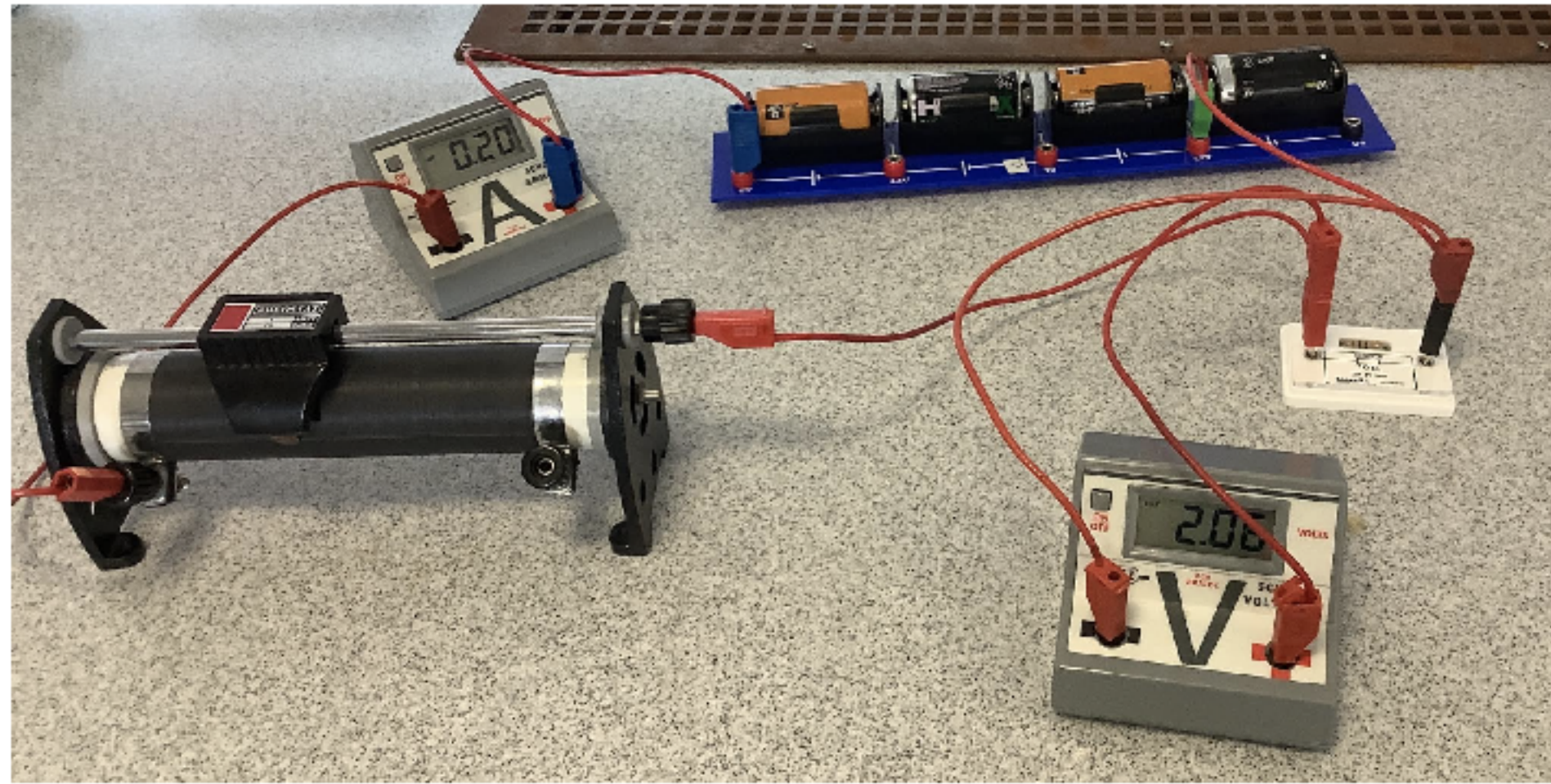
# Required practical: finding the IV characteristics for a fixed resistor, filament lamp, and diode



Data when battery FLIPPED

Data when battery NOT flipped

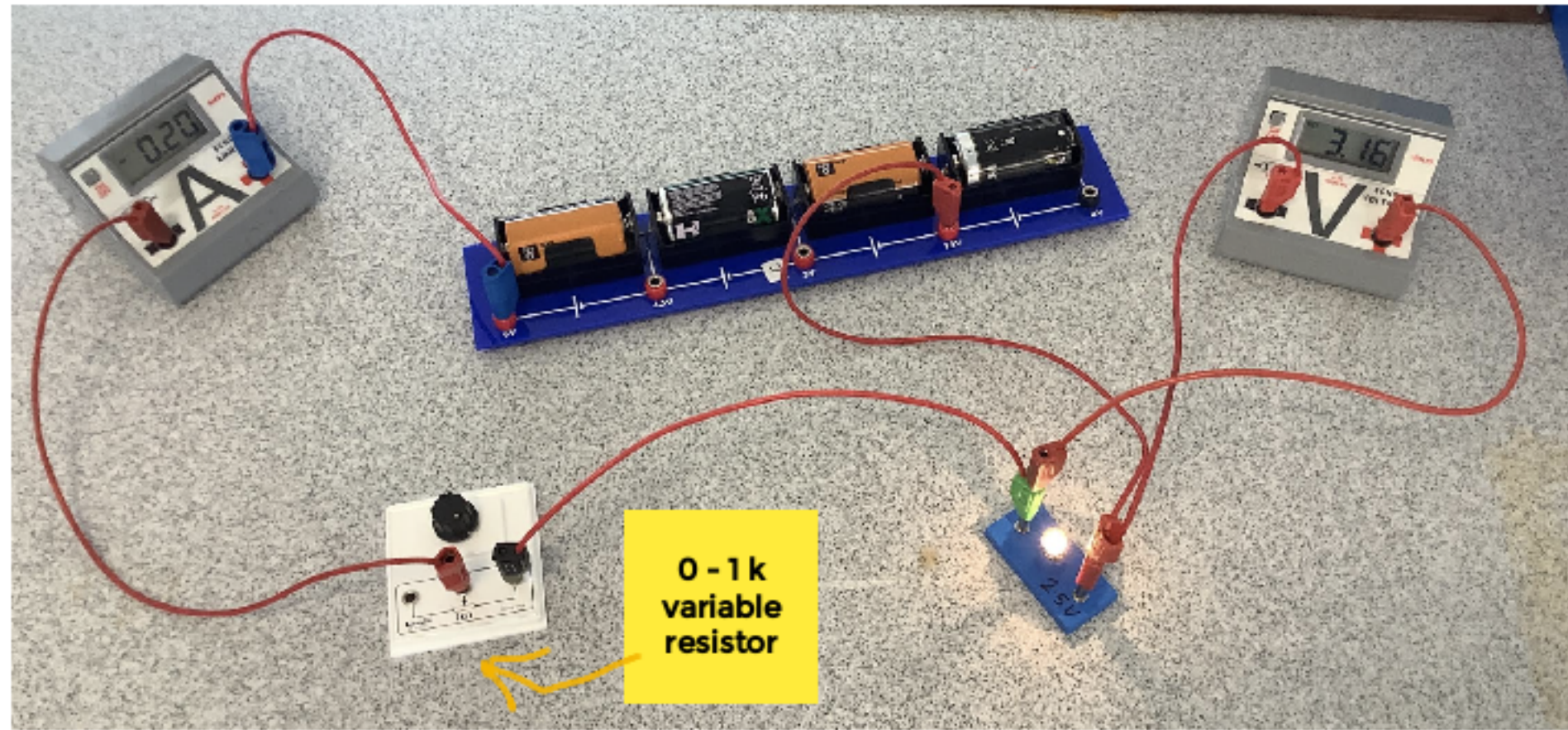
# Part 1/3: IV characteristic for a fixed resistor



1. Set up the circuit as shown.
2. Make sure the readings on both the ammeter and voltmeter are positive.
3. Set the variable resistor so that you get the largest value of potential difference.
4. Note down the value for the potential difference and current in the table.
5. Change the setting on the variable resistor.
6. Repeat steps 4 to 5 until you have at least four pairs of readings. Try and make sure the values of  $V$  are equally spaced.
7. FLIP THE BATTERY.
8. Check that the voltmeter and ammeter display negative readings.
9. Repeat steps 3-6.

Battery not flipped		Battery flipped	
Potential Difference (V)	Current (A)	Potential Difference (V)	Current (A)

# Part 2/3: IV characteristic for a filament lamp (bulb)

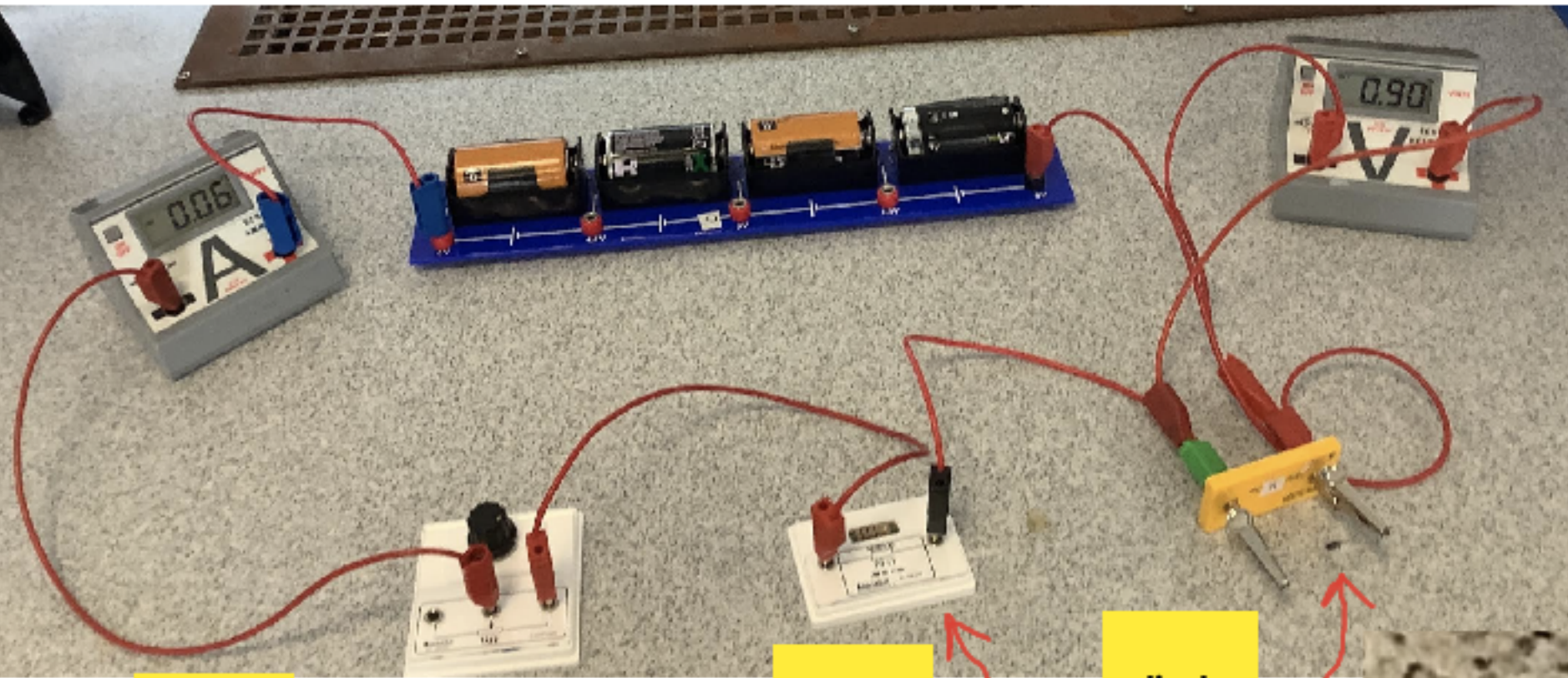


1. Set up the circuit as shown.
2. Make sure the readings on both the ammeter and voltmeter are positive.
3. Set the variable resistor so that you get the bulb at **MAXIMUM BRIGHTNESS**
4. Note down the value for the potential difference and current in the table.
5. Change the setting on the variable resistor so that the bulb is **NOTICEABLY DIMMER**. (Usually, only a very small adjustment is needed)
6. Repeat steps 4 to 5 until you have at least four pairs of readings. Try and make sure the values of V are equally spaced.
7. **FLIP THE BATTERY.**
8. Check that the voltmeter and ammeter display negative readings.
9. Repeat steps 3-6.

Battery not flipped		Battery flipped	
Potential Difference (V)	Current (A)	Potential Difference (V)	Current (A)

# Part 3a/3: IV characteristic for a diode

1. Set up the circuit as shown.
2. Make sure the readings on both the ammeter and voltmeter are positive.
3. Set the variable resistor so that the ammeter reading is zero.
4. Note down the value for the potential difference and current in the table.
5. Change the setting on the variable resistor so that you get a very small current reading on the ammeter.
6. Repeat steps 4 to 5 until you have at least four pairs of readings. Try and make sure the values of V are equally spaced.
7. See next slide.



variable resistor

protective resistor

diode



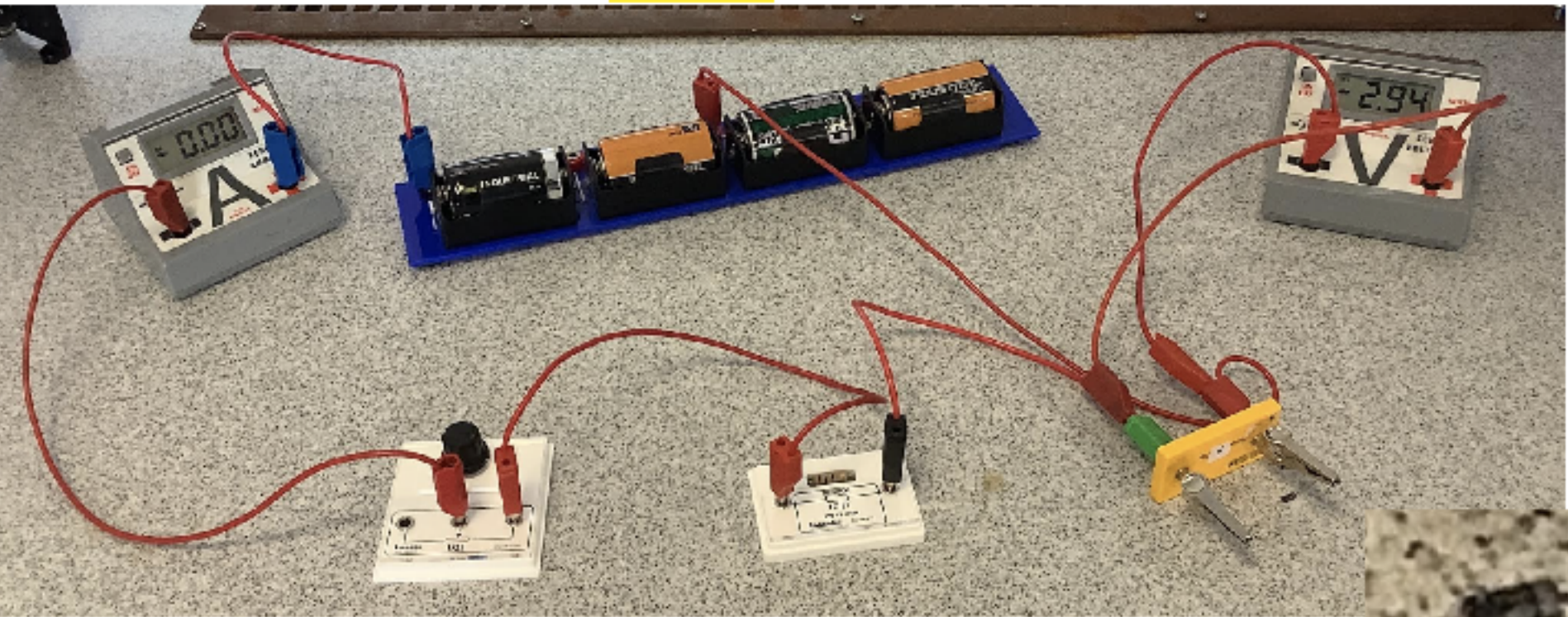
Make sure the silver band on the diode is pointed AWAY from the positive of the cells

Battery not flipped		Battery flipped	
Potential Difference (V)	Current (A)	Potential Difference (V)	Current (A)

# Part 3b/3: IV characteristic for a diode

[Continued from previous slide]

Connector  
A



- 7. FLIP THE BATTERY
- 8. Adjusting the variable resistor may prove ineffective. To change the potential difference, move connector A.
- 9. Make sure you have four different values of negative potential difference and note down the current and potential difference values.



Make sure the silver band on the diode is pointed TOWARDS the positive of the cells

Battery not flipped		Battery flipped	
Potential Difference (V)	Current (A)	Potential Difference (V)	Current (A)