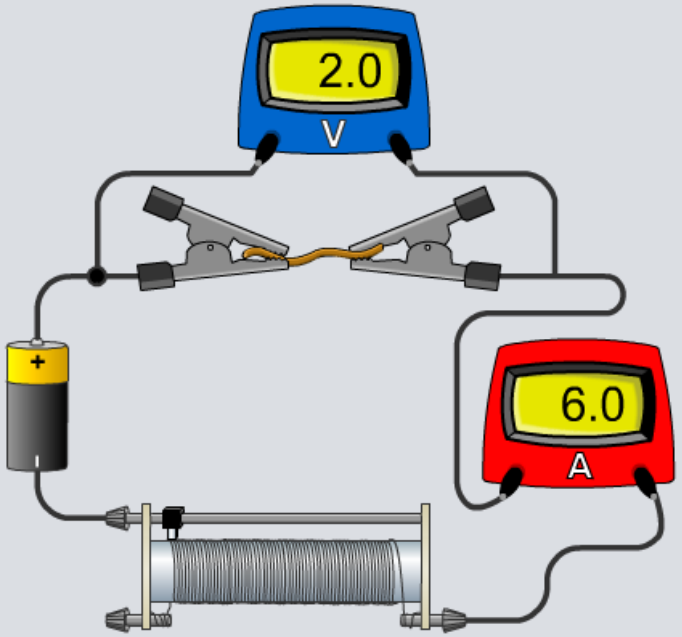
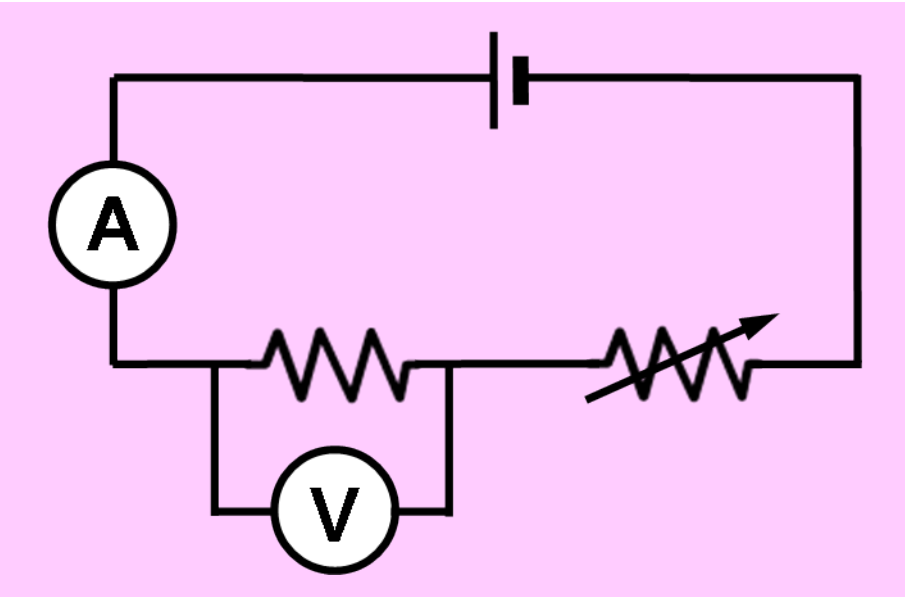
Current, Voltage and Resistance



How can resistance be investigated?

Set up this circuit with a resistor and a variable resistor.



voltage (V)	current (A)
0.0	0.0
0.5	0.6
1.0	1.1
1.5	1.8
2.0	2.5
2.5	3.0
3.0	3.5
3.5	4.2

Slowly move the variable resistor so that the voltage increases by 0.5 V and record the current for each setting.

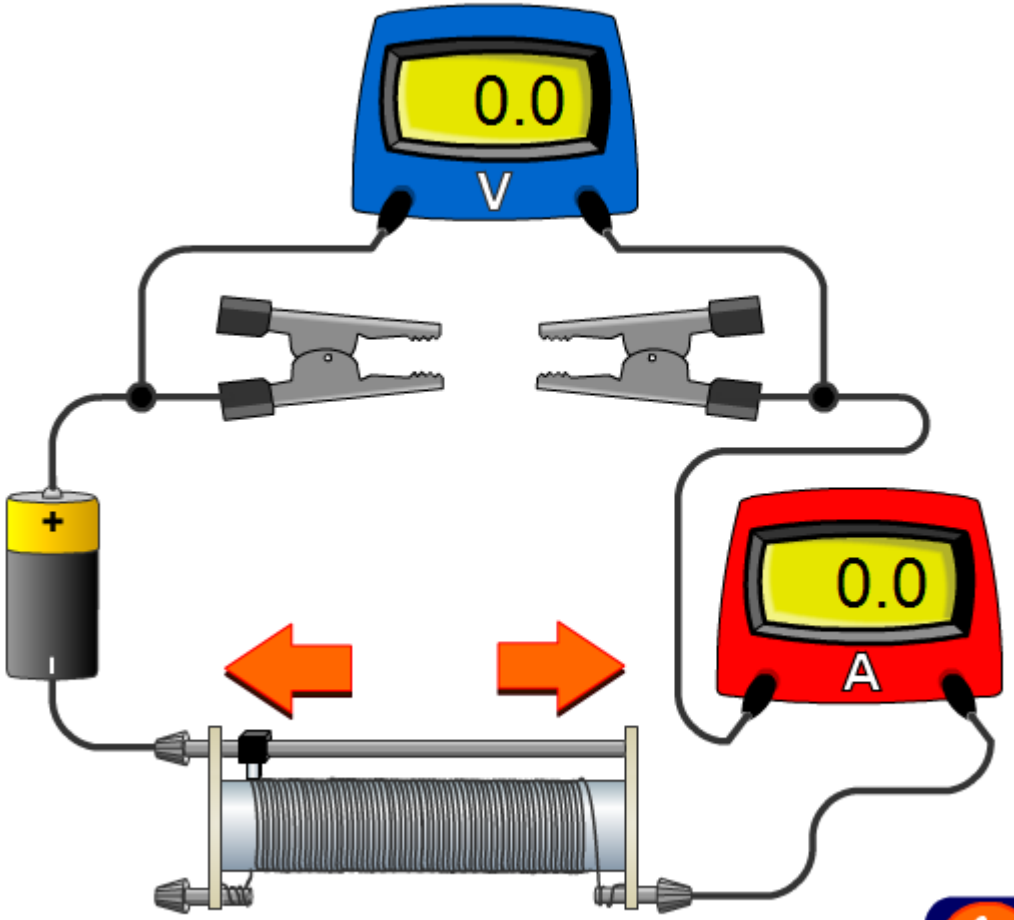
Plot a current-voltage graph of the results.

Investigating current and voltage

Investigate the relationship between voltage and current

Component Bank

- fixed resistor 
- diode 
- bulb 
- copper wire 
- nichrome wire 

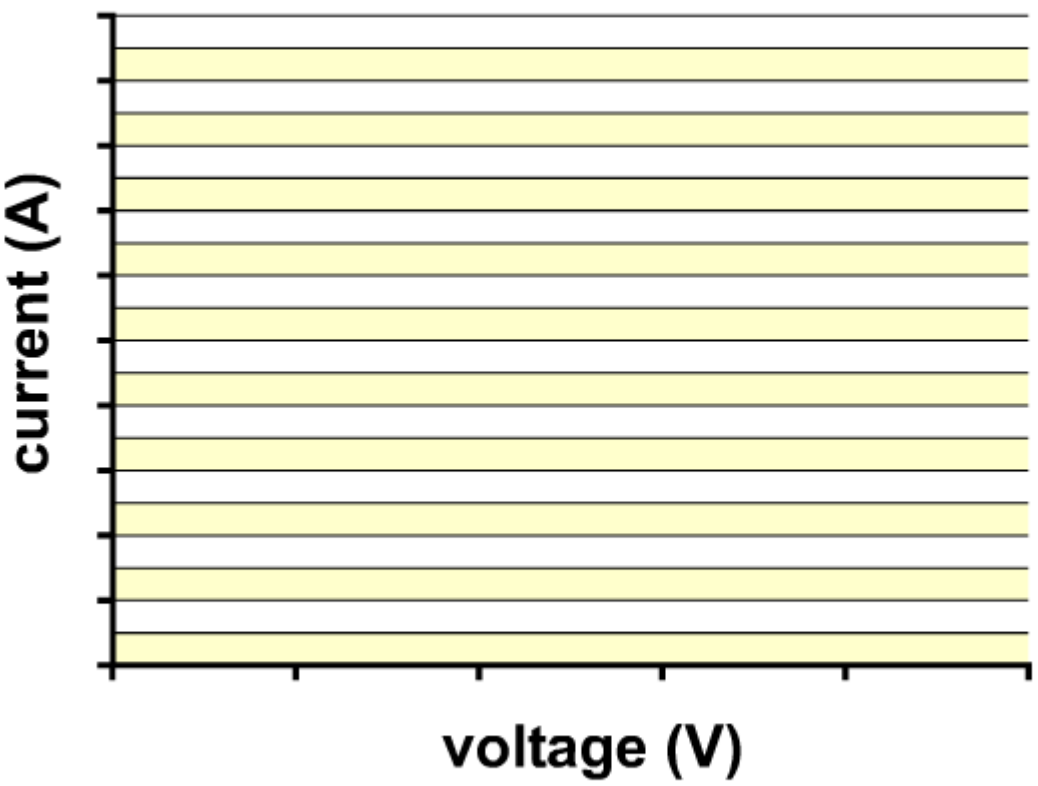


Current–voltage graphs

What is the relationship between voltage and current?

The relationship between current and voltage can be investigated by plotting the experimental results for a piece of copper wire.

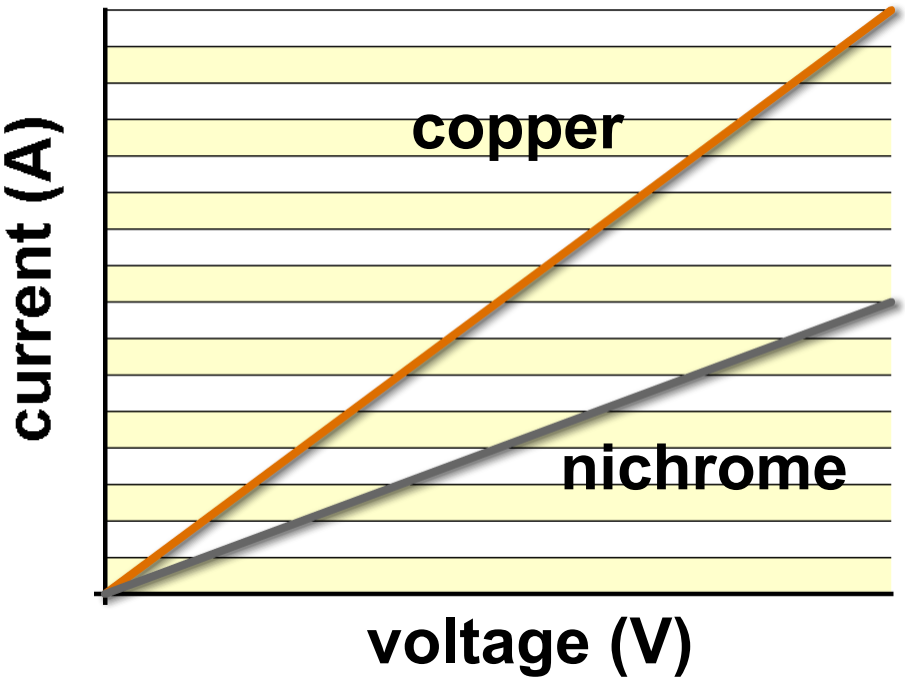
Click "**play**" to find out more.



Is resistance the same in all wires?

Plotting current–voltage results for nichrome and copper wires on the same graph gives straight lines with different gradients.

At the same voltage, a copper wire allows a larger current than a nichrome wire of the same size.



This means that the copper wire has a lower resistance than the nichrome wire. What does the gradient tell you about resistance?

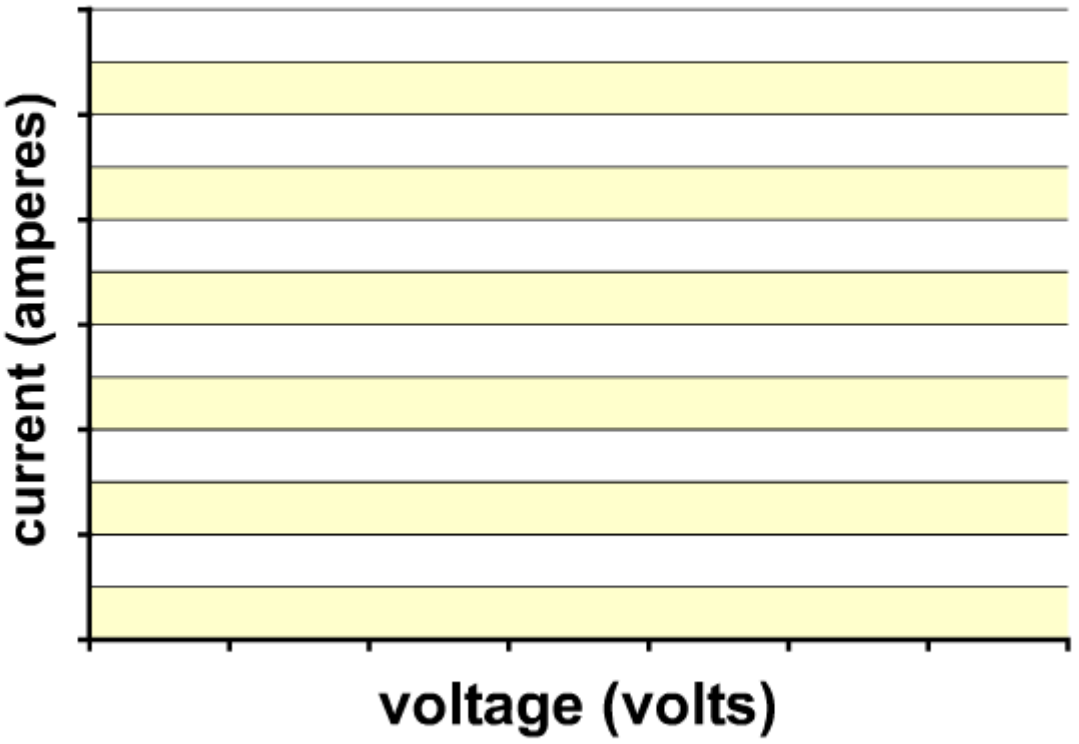
The steeper the gradient of a current–voltage graph, the lower the resistance of the wire.

Current–voltage graph for a bulb

What is the current–voltage graph for a bulb?

As the voltage increases across a light bulb, the filament gets very hot and gives out light.

Click "**play**" to find out how this affects resistance.

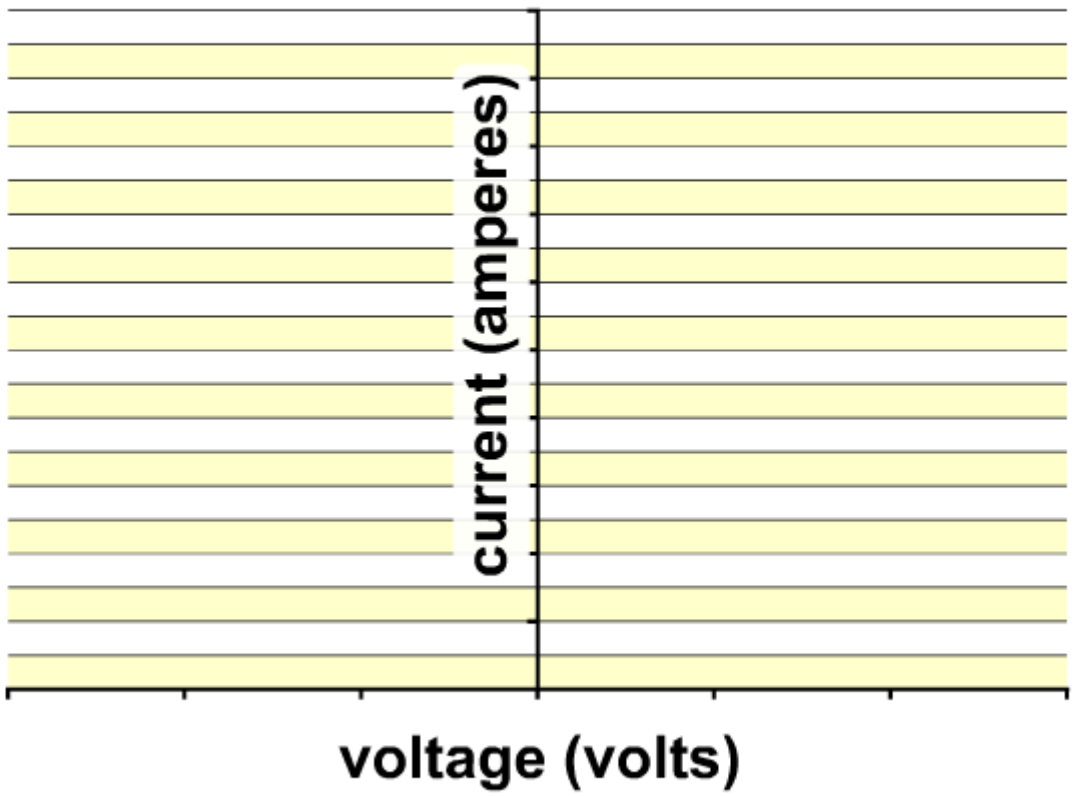


Current–voltage graph for a diode

What is the current–voltage graph of a diode?

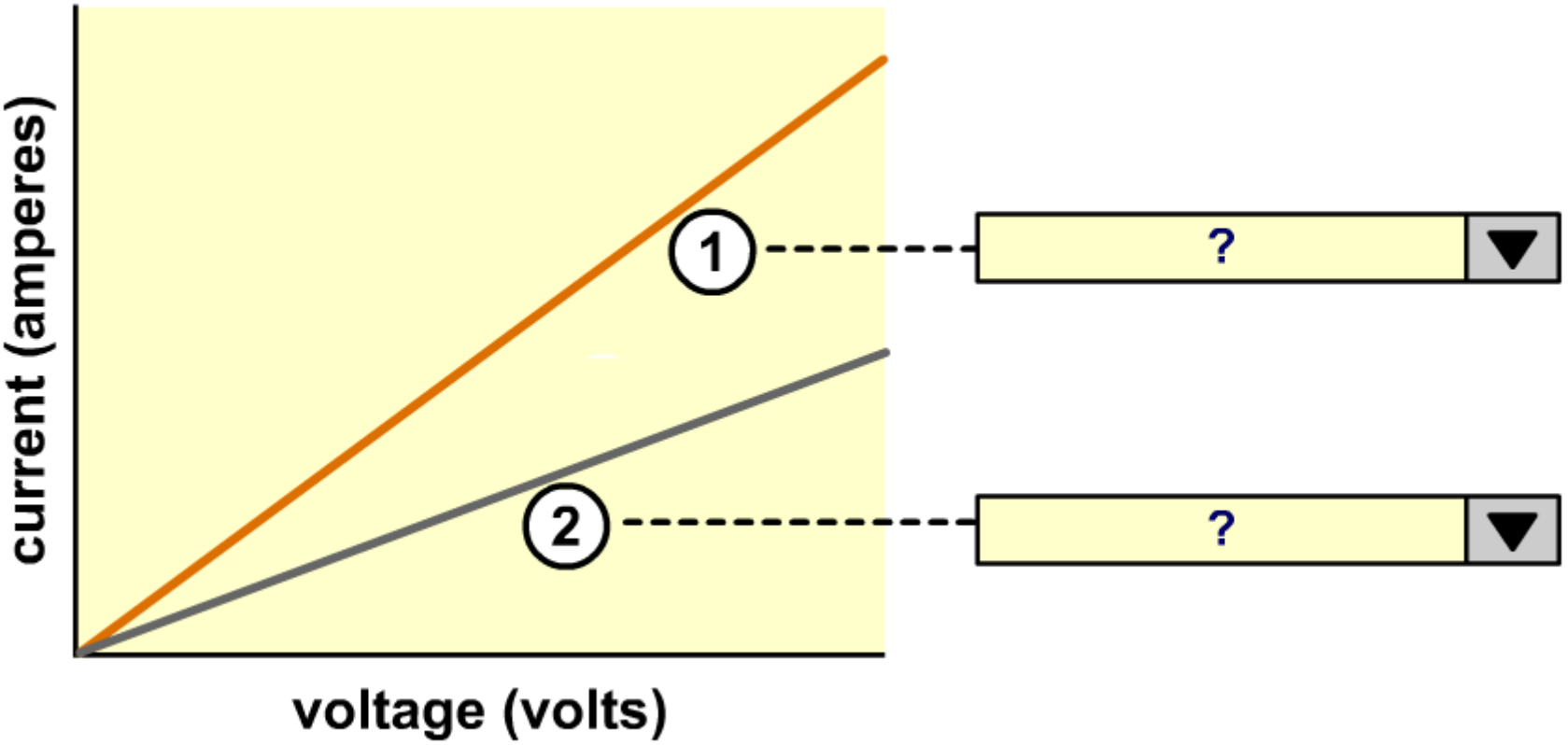
A diode is a resistor that allows electricity to only flow in one direction.

Click "**play**" to see its current–voltage graph.



Current–voltage graphs

What is happening in these current–voltage graphs?



solve