



# Fuses and Earthing

Workbook  
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Q1 Put ticks in the table to show which wires match each description.

Description	Live	Neutral	Earth
Must always be connected	X	X	
Just for safety			X
Electricity normally flows in and out of it	X	X	
Alternates between +ve and -ve voltage	X		



I used crosses 'cause it is easier!

You should always do as they say!

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Q2 Match up the beginnings and endings of these sentences:

- |                                       |   |
|---------------------------------------|---|
| The live and neutral wires...         | ... should be connected to the earth wire.        |
| A circuit breaker...                  | ... should normally carry the same current.       |
| A Residual Current Circuit Breaker... | ... does the same job as a fuse.                  |
| Any metal casing...                   | ... can be used instead of a fuse and earth wire. |

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Q3 Answer the following questions about a kettle:



- a) Suggest what could cause a surge of current in the kettle's circuit.  
**There is a fault in the circuit OR a surge of mains power OR the live wire connection breaks loose and touches the metal case**
- b) How would a fuse in the kettle's circuit help prevent electric shocks?  
**If the case became live a large current would flow to Earth and this would melt the fuse and disconnect the kettle from the mains supply**
- c) Molly chooses a fuse for the kettle. How should she decide what fuse to use?  
**The fuse should be of a value just above the operating current of the kettle.  $P=IV$  so  $I=P/V$  ( $V$  is 230V) so she should divide the power of the kettle by 230 and pick the next higher available fuse.**

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Q4 These sentences describe how a fuse and earth wire work together to help prevent you getting an electric shock from your toaster. Put numbers in the boxes to show the order they should go in.

- 3 The surge in current causes the fuse wire to heat up.
- 6 Everything is now safe.
- 1 A fault develops and the earthed casing becomes connected to the live supply.
- 5 The live supply is cut off.
- 4 The fuse blows.
- 2 A large current now flows in through the live wire and out through the earth wire.

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