

CAIE Physics IGCSE

Topic 4.4 - Electrical Safety

Flashcards

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What are four hazards of electric circuits?



What are four hazards of electric circuits?

- Damaged insulation
- Overheating of cables
- Damp conditions
- Overloading plugs, extension leads, single and multiple sockets when using a mains supply



How does damaged insulation pose a hazard?



How does damaged insulation pose a hazard?

Sections of wire can be left exposed, and contact can result in electric shocks or pose a fire hazard.



How does overheating pose a hazard?



How does overheating pose a hazard?

High currents cause the wires to heat up, melting the insulation and potentially causing a fire.



How do damp conditions pose a hazard?



How do damp conditions pose a hazard?

Water can conduct a current, causing electric shocks etc.



How does overloading plugs pose a hazard?



How does overloading plugs pose a hazard?

Causes overheating by producing high currents.



What wire components make up a mains circuit?



What wire components make up a mains circuit?

A live, neutral, and earth wire.



What is the function of the live wire in a mains circuit?



What is the function of the live wire in a mains circuit?

The live wire (line wire) delivers the current to the circuit.



What is the function of the neutral wire in a mains circuit?



What is the function of the neutral wire in a mains circuit?

The neutral wire carries the current back to the power source.



What is the purpose of the earth wire in a mains circuit?



What is the purpose of the earth wire in a mains circuit?

The earth wire protects from sudden voltage fluctuations by providing a safe path for current to flow in case of a fault (preventing electric shocks).



Why is the switch connected to the live wire in a mains circuit?



Why is the switch connected to the live wire in a mains circuit?

The switch is connected to the live wire so that when it is switched off, the flow of current is stopped, making the circuit safe.



What safety devices are used in mains circuits to stop the flow of current if it becomes too high?



What safety devices are used in mains circuits to stop the flow of current if it becomes too high?

Fuses and trip switches.



What is a fuse?



What is a fuse?

A thin piece of wire which overheats and melts if the current is too high.



How should the rating of a fuse be chosen?



How should the rating of a fuse be chosen?

It should be slightly higher than the current used by the device in the circuit.

(common examples: 3A, 5A, 13A)



What is a trip switch?



What is a trip switch?

A trip switch is an automatic switch that flicks off when the current is too high, breaking the circuit. It can be reset and used again.



What are advantages of trip switches over fuses?



What are advantages of trip switches over fuses?

- They can be reset and used again
- They operate faster



How can the risk of electrocution from wires in the mains circuit be reduced?



How can the risk of electrocution from wires in the mains circuit be reduced?

Covering wires in an outer casing



What are the two types of outer casing for wires?



What are the two types of outer casing for wires?

- non-conducting (double-insulated)
- earthed



What is a non-conducting casing?



What is a non-conducting casing?

Two layers of insulating material
(non-metals).



What is earthing?



What is earthing?

Connecting an earth wire to a metal casing.



How do earth wires deal with surges?



How do earth wires deal with surges?

They have a very low resistance, so in surges a lot of current flows through them, blowing the fuse and disconnecting the circuit.



How does a fuse without an earth wire deal with surges?



How does a fuse without an earth wire deal with surges?

By melting and so breaking the circuit if the current is too high.

