

# Mains Electricity Summary

## 1. Plugs

- **Blue** wire is called the **neutral** wire
- **Brown** wire is called the **live** wire, it is connected to the fuse
- **Green and yellow** wire is called the **earth** wire and it goes to the **longest pin** at the top
- **Fuse is always connected next to the live**
- Cable grip prevents wires coming loose and short circuiting
- Wires are covered in plastic, this is a good insulator and prevents short circuits and shocks

## 2. Safety features

- **Fuse** or fuse wire - **slow** to blow, **breaks the circuit** when the **current is too large**, need to be **replaced**, they prevent fires.
- Miniature circuit breakers or mcb - these work in the same way as a fuse - when the **current is too large** they **break the circuit**, unlike the fuse they are **quick** and can be **reset**, found in the consumer unit where the mains comes into the house ( used to be a fuse box ), they prevent fires.
- Residual circuit device or rcd - these work differently, they detect a **small difference between the current in the live wire and the current in the neutral** ( they should be the same when the lawn mower or hedge trimmers work normally ) and break the circuit, they act **very quickly** and can be **reset**, they protect the user.

### 3. Earth and fuse

- This prevents fire, when a fault occurs such as a wire comes loose, a large current flows through the Earth wire to ground, this causes the fuse to melt and blow, breaking the circuit and making it safe.

### 4. Which fuse?

- To find out which fuse to use

$$\text{Current in A} = \frac{\text{Power in W}}{\text{Voltage in V}}$$

Choose nearest fuse higher than the answer

- Example: what fuse would you use in an iron rated at 920W running on a 230 V mains supply?

Answer:

$$\frac{920\text{W}}{230\text{V}} = 4 \text{ A}$$

Fuses come in 3A, 5A and 13A ratings so choose 5A