

Electricity in the Home and Electronics

Electricity comes into your house by a main **live** wire.
This wire passes through your **meter**.
It also passes through a 'fuse box' (distribution box).
This box has many switches that can be 'tripped' (switched off)
if there is a problem with electricity in your house.



FUSES

A fuse is a piece of wire that will melt if too much current passes through it. Fuses are always found connected to a live wire. They protect us from getting an electric shock.

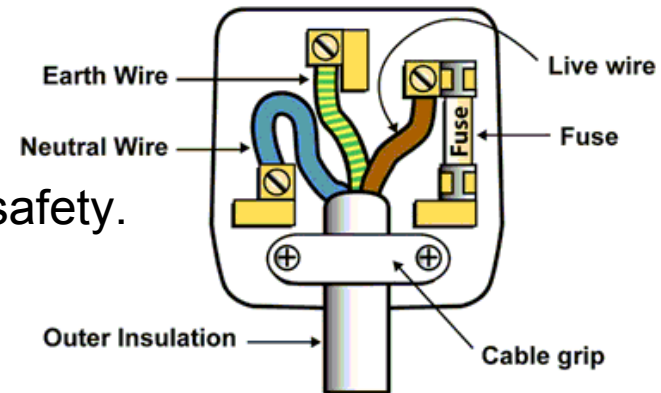
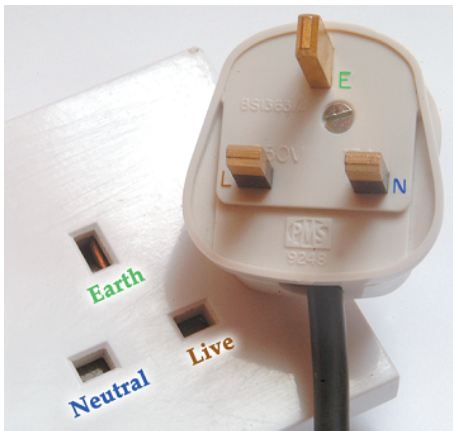


Plugs

The **Live** wire carries the electricity.

The **Neutral** wire has no charge.

The **Earth** wire connects to the ground for safety.



The live wire has the fuse attached for safety.
When you plug something in there are 2 safety caps inside the wall socket for extra safety.

Calculations

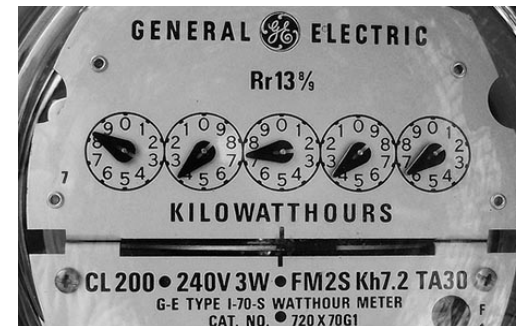
A kilowatt-hour is the electrical energy converted by a 1kW Appliance running for 1 hour.

For example: A 2 kW appliance running for 3 hours will use **6 units** of electricity.
This is **Power x Time**

Sample Question:

A cooker switched on for 2 hours and using 8 kW will use 16 units of electricity.

If each unit costs 17 cent we multiply $16 \times 17 = \text{€}2.72$



KW = kilo watt

A 1 KW iron converts 1000 J
into heat energy every second.

Kilowatt hour — energy used per hour.

How many units are used?

$$2 \text{ kW fire for } \frac{1}{2} \text{ hour} = 2 \times \frac{1}{2} = 1 \text{ unit}$$

$$3 \text{ kW machine for } 1 \text{ hour} = 3 \times 1 = 3 \text{ units}$$

$$6 \text{ kW for } 2 \text{ hours} = 6 \times 2 = 12 \text{ units}$$

$$8 \text{ kW shower for } 10 \text{ minutes} =$$

$$8 \times \frac{1}{6} = 1.3$$

$$20 \text{ W } (\overset{\text{New}}{0.02} \text{ kW}) = \overset{\text{old}}{0.115} \text{ kW}$$

Electricity costs 15 cent per kWh

CFL

$$\frac{20}{1000} = 0.02$$

$$.02 \times 15 \\ = .30 \text{ cent}$$

Old bulb

$$0.115$$

$$.115 \times 15 \\ = 1.73 \text{ cent}$$

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Ordinary

$$100 \text{ W} = .1 \text{ kW}$$

$$.1 \text{ kW} \times 6 \text{ hours} = .6$$

$$.6 \times 365 \text{ days} = 219$$

$$219 \text{ units} \times 18 \text{ cent}$$

$$= \text{€ } 39.42$$

$$- \text{€ } 13.85$$

$$\text{€ } 25.57$$

New CFL bulb

$$20 \text{ W} = 0.02 \text{ kW}$$

$$.02 \times 6 \text{ hours} = .12$$

$$.12 \times 365 \text{ days} = 43.80$$

$$43.80 \text{ units} \times 18 \text{ cent}$$

$$= \text{€ } 7.85 + \text{€ } 6$$

$$\text{€ } 13.85$$

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$$\frac{150 \text{ W}}{1000} = 0.15 \text{ kW} \times 5 \text{ hours}$$
$$= 0.75 \text{ units}$$

$$.75 \times .16 = 0.12 \text{ cent}$$

$$4 \text{ bulbs} = 12 \text{ cent} \times 4 = 48 \text{ cent.}$$

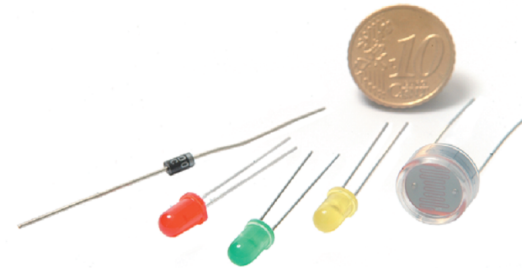
How much does a bulb cost
if it uses 50 W and is
on for 10 hours a day for a year.
Each unit costs 18 cent.

Electronics

We use microchips in everything these days.
These are tiny chips with full electric circuits and components built in.

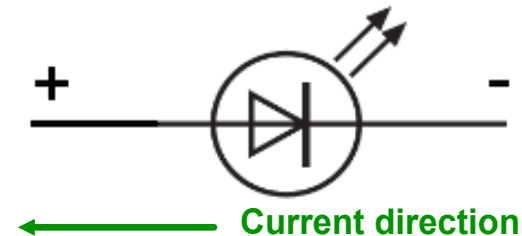
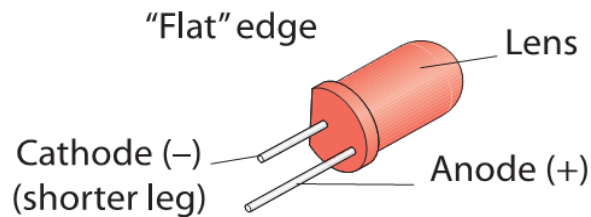
2 components we will look at are the,

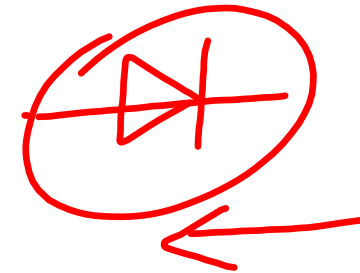
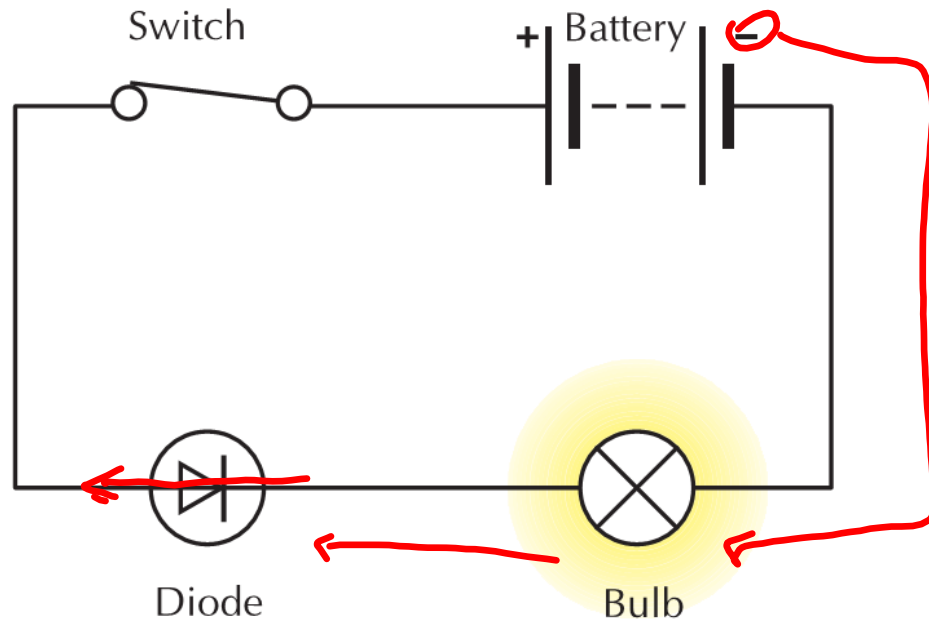
1. **LED** - Light Emitting Diode
2. **LDR** - Light Dependent Resistor



A diode is a device that lets electricity pass through in one direction only.

A diode has 2 electrodes. The **short** one is the **cat**hode and is the negative (-) end.





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