

How Do Electric Circuits Work?

Lesson 11, Part 1: Domestic Electricity

Electrical Power

The kilowatt hour (kWh)

Power companies charge their customers according to the amount of **electrical** delivered.



In science, energy is measured in (J).

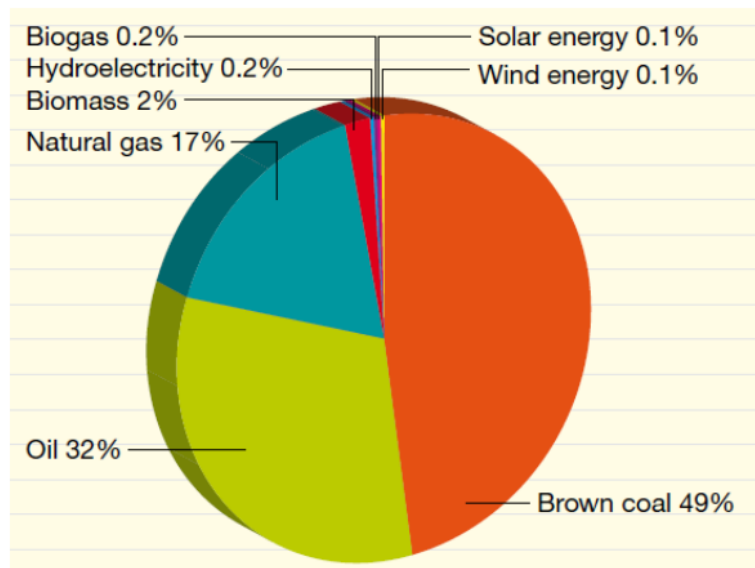
Power companies use an alternative and larger unit for energy called the hour (kWh).

1 kilowatt hour is the amount of delivered by a power source operating at **1** **Watt** for **1**

$W = E = Pt$

$1 \text{ kWh} = \dots\dots\dots \text{ MJ} = 3.6 \times 10^6 \text{ J}$

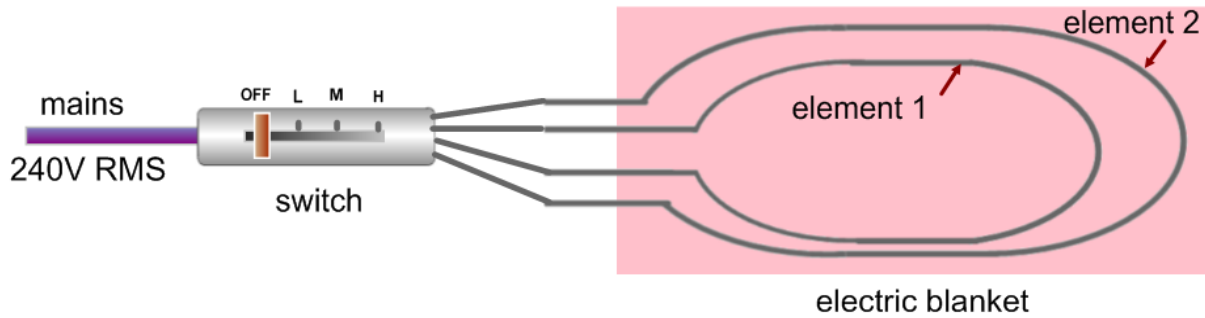
Power Generation Sources



Sources for generating electricity in Victoria

Worked Example

An electric blanket has three power settings LOW, MEDIUM and HIGH. To achieve these settings, the switch is wired to connect the elements either in series, parallel or one at a time. Each element has a resistance of 320Ω .

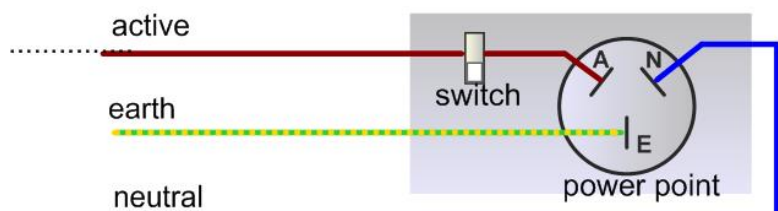
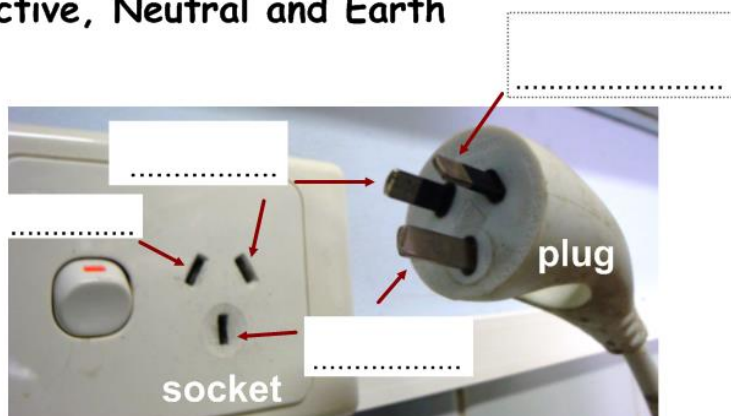


Calculate both the **current** flowing and the **power** dissipated in the electric blanket when the switch is set to;

- a The LOW position (HINT: The elements are connected in series)
- b The MEDIUM position
- c The HIGH position

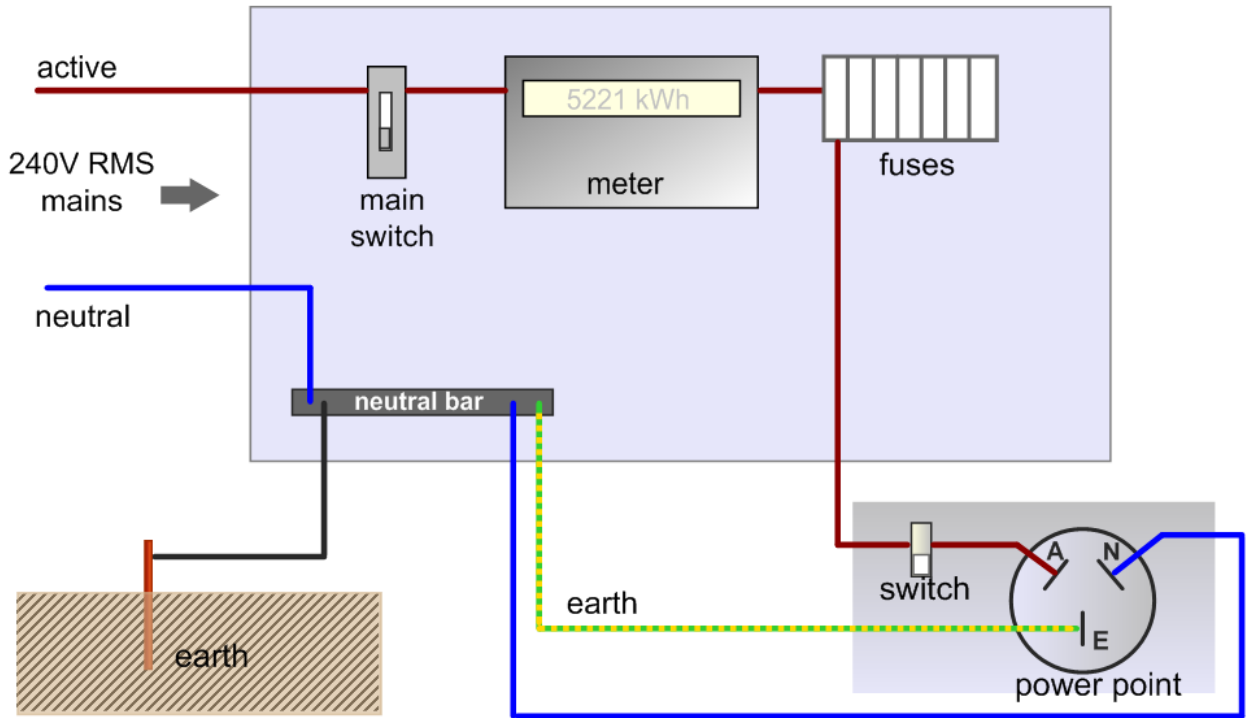
Household Power Circuit

Labelling Active, Neutral and Earth



Household Power Circuit

Meter Box



Describe the **purpose** of each of the following:

Active Wire

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.....

Neutral Wire

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Earth Wire

.....
.....

Meter

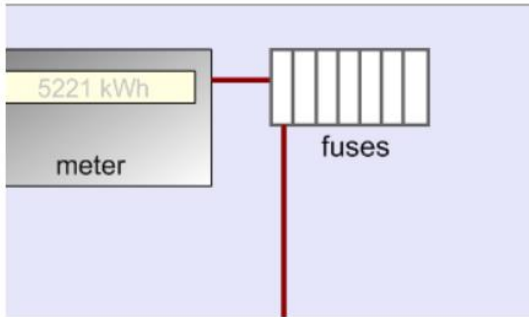
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Main Switch

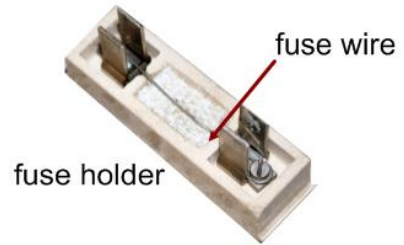
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Household Power Circuit (Continued)

Fuses



circuit symbol



Fuse wire is designed to and cause an open circuit if an over-large current passes through it.

Fuse wire is according to the that it can pass without melting.

..... Amp is typical for household power points.



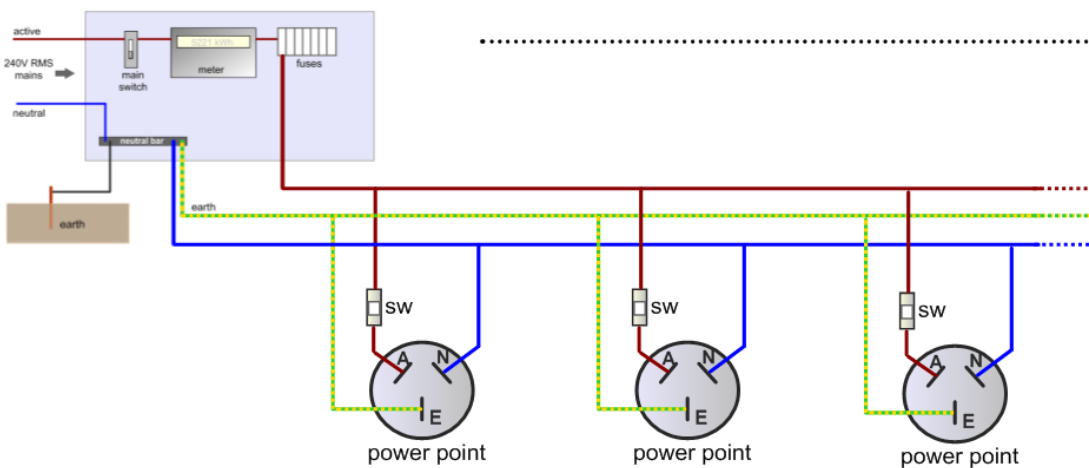
Household Power Circuit

Household Wiring

The **switch** is always connected in the **active** line and not the neutral because

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.....



Power points are connected in because most **mains operated** household devices are designed for the **same voltage**, **Volts RMS**.

