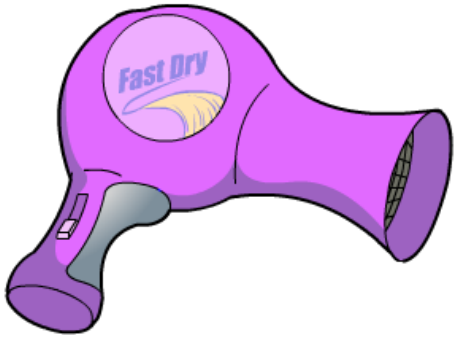
Electrical Power

What is electrical power?

Electrical power is the rate at which an electrical appliance uses electrical energy. All appliances have a power rating.

Power is measured in **watts** (W). 1000 watts = 1 **kilowatt** (kW). 1 watt of power means that 1 joule of energy is used every second.

Appliances that need to create heat, such as washing machines, ovens, blow-dryers and microwaves, usually use the most power.



TVs, radios and computers usually use the least amount of power.

What is the formula for electrical power?

In electrical devices, power can be calculated using the formula:

power = current x voltage

$$P = I \times V$$

What are the units of power, current and voltage?

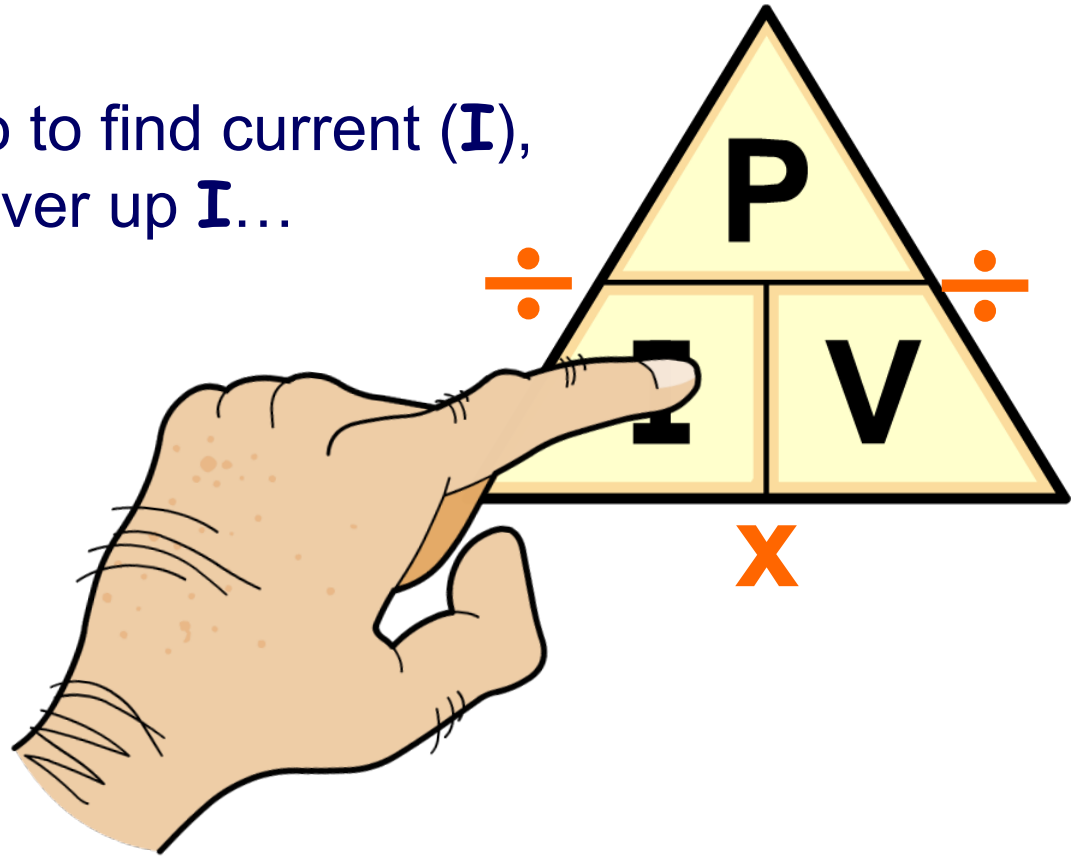
- Power is measured in **watts** (W) or **kilowatts** (kW).
- Current is measured in **amps** (A).
- Voltage is measured in **volts** (V).

Can I use a formula triangle?

A formula triangle helps you to rearrange a formula.
The formula triangle for **P = IV** is shown below.

Cover up whatever quantity you are trying to find to leave the calculation required.

So to find current (**I**), cover up **I**…



…which gives the formula…

$$I = \frac{P}{V}$$

How is power calculated?

A filament bulb has a potential difference of 200 V across it and a current of 0.2 A running through it.

At what power is the filament bulb operating?

$$P = IV$$

$$= 0.2\,A \times 200\,V$$

$$= 40\,W$$

Jupiterimages Corporation

Electrical power – calculations

You will need this equation to answer the following questions about power:

power = current x voltage

Click "**start**" to begin.

start