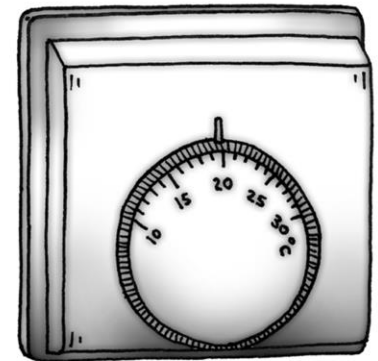
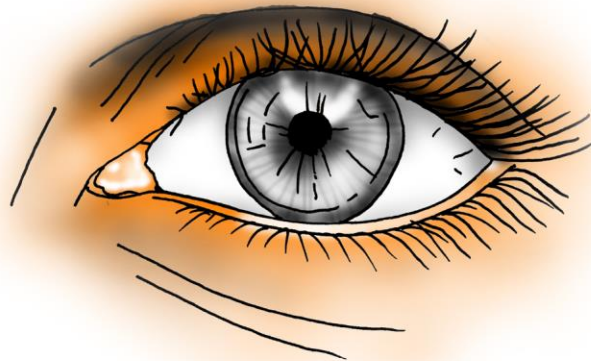


# AQA GCSE ELECTRICITY THINK IT!



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### Resistance:

- Describe the difference between ohmic and non-ohmic conductors. Sketch current-potential difference graphs for ohmic and non-ohmic conductors.
- Explain to the person next to you the measurements that you should take to find the resistance of an electrical component.
- Draw the circuit that you would use.
- Find out how you could measure the resistance of air.

### Current, Potential Difference and Resistance:

- Research how circuit symbols have changed in the last 100 years. Give reasons for the changes to the circuit symbols.
- The unit of charge is the Coulomb (C). Find out about the person the unit was named after.
- The charge on an electron is  $1.6 \times 10^{-19}$  C. Work out how many electrons are needed to give a change of 1 C.
- Find out the charge flow, current and potential difference of a lightning strike.

### The National Grid

- Power stations can be connected to homes using overhead or underground powerlines. Discuss the advantages and disadvantages of both types of powerline.
- Transformers come in three main types: step-up, step-down and isolating. Compare the construction and uses of the three types of transformer.
- In 1880s America, Thomas Edison connected homes to power stations using 110 V dc. What is it now?

### Mains Electricity:

- The live wire in a three core electrical cable is brown. The live wire used to be red. Find out why the colour of the live wire has changed.
- In 2005, a law was passed stating that only qualified electricians could carry out electrical installations in the home. Discuss with your peers the advantages and disadvantages of this law.
- Electrical wiring in the home is very safe, yet three to four people die of electrocution each year. RCDs can reduce the risk of electrocution. Find out how RCDs work.

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# AQA GCSE Electricity

# ThinkIT!

### Series and Parallel Circuits:

- Explain to your peers why Christmas tree lights are connected in parallel rather than series.
- Find out why voltmeters must be connected in parallel across a component, rather than in series with it.
- Adding bulbs in parallel to a circuit keeps the brightness of the bulbs the same but increases the current in the main branch of the circuit. Find out if there is a limit to the number of bulbs that can be connected.

### Electrical Components:

- Diodes only allow an electric current to flow in one direction unless a high negative potential difference is applied. Find out how a large negative potential difference allows a current to flow in the reverse bias in a diode.
- Thermistors are temperature dependent resistors. Find out why the resistance of a thermistor varies with temperature.
- Describe how a thermistor can be used to turn on the heating in a house.

### Energy Transfers:

- Describe the energy transfers in: a filament lamp, an electric motor and a radio.
- A standard filament lamp has a power rating of 100 W. Determine how much money you would save each year on your electricity bill if all your light bulbs were changed from 100 W filament lamps to 12 W LEDs. What assumptions did you make?
- Alessandro Volta invented the battery. Find out how Volta's battery differs from a modern battery.

### Static Electricity (physics only):

- A balloon that is rubbed on your head can then be stuck to a wall. Find out why the balloon will never repel away from the wall.
- Static can be used to remove dust from smoke in industrial chimneys. Discuss the benefits of this with the person next to you and find out how the dust is removed.
- When insulating materials are rubbed a charge can build up. What determines whether the material builds up a positive or a negative charge?