Your notes

GCSE Physics: revision notes

Static electricity

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Charging by friction

- When certain insulating materials are rubbed against each other, they become electrically charged.
- Negatively charged **electrons** are rubbed off one material and onto the other.
- The material that gains **electrons** becomes negatively charged. The material that loses **electrons** is left with an equal positive charge.
- Only **electrons** move: protons stay in the nuclei of the atoms.

Forces between charges

- When two charged objects are brought close together, they exert a force on each other.
- Like charges **repel**; unlike charges **attract**.
- This is a **non-contact force**: the objects don't need to touch.

Electric fields

- A charged object creates an **electric field** around itself. The field is strongest close to the object.
- A second charged object placed in the field experiences a force, which gets stronger as the distance between the objects decreases.
- The field around an isolated charged sphere is drawn as straight lines going outwards (from positive) or inwards (to negative), like the spokes of a wheel.

Sparks

- If the charge builds up enough, the **electric field** can become strong enough to make the air conduct.
- **Electrons** jump across the gap as a **spark**, for example between a charged object and an earthed conductor.

- **Sparks** can ignite fuel vapour, so fuel tankers are earthed while refuelling.

Key terms

Static electricity	Charge that builds up on an insulated object.
Electron	A negatively charged particle that can be transferred by friction.
Repel	Push apart; like charges repel.
Attract	Pull together; unlike charges attract.
Electric field	The region around a charged object where another charged object feels a force.
Non-contact force	A force that acts without the objects touching.
Earthing	Connecting an object to the ground so charge can flow away safely.
Spark	A flow of charge through the air when the electric field is strong enough.

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. Which particles move when an object is charged by friction?
2. A polythene rod gains electrons when rubbed. What charge does it have?
3. What charge is left on a material that loses electrons?
4. What happens when two negatively charged rods are brought close?
5. What happens when a positive and a negative object are brought close?
6. Where is the electric field around a charged sphere strongest?
7. What causes a spark?
8. Why are fuel tankers earthed when refuelling?

Answers

1. Electrons
2. Negative
3. Positive
4. They repel
5. They attract
6. Close to the sphere
7. Charge jumping across a gap when the electric field is very strong
8. To stop sparks that could ignite the fuel

What to do next

Practise 10 questions on this topic

Try 7 exam questions, with mark schemes

Read the lesson, one step at a time

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