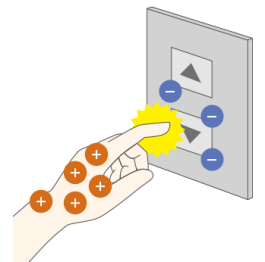
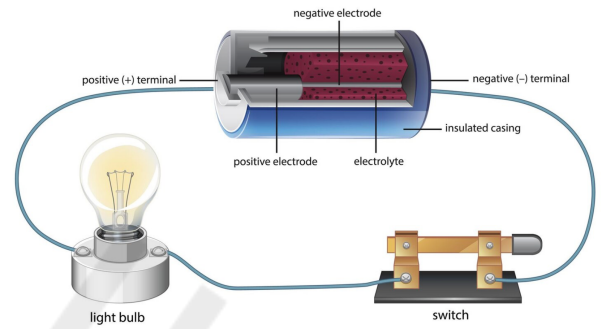


Physics GCSE: Electricity

Electric Charge is caused by the **flow of electrons**

- **Charge (Q)** is measured in **coulombs (C)**
- Two types: **positive** and **negative**
- Like charges **repel**
- Opposite charges **attract**
- The charge of subatomic particles:
 Proton: +1
 Electron: -1
 Neutron: 0
- **Ions** form when atoms gain or lose electrons
- **Conductors** (e.g. metals): electrons are **delocalised**
- **Insulators** (e.g. plastic): electrons are **fixed**



Static Electricity is caused by **transfer of electrons** between insulators by **friction**

- Object that **loses electrons** → positive charge
- Object that **gains electrons** → negative charge

Charges build up because electrons **cannot move away**

Electric Phenomena

- **Lightning**: discharge between charged clouds and Earth
- **Balloon on wall**: charge induces opposite charge in wall
- **Comb picking up paper**: induced opposite charges cause attraction

Uses of Static Electricity

- Inkjet printers
- Photocopiers
- Paint spraying

Dangers & Safety of Electricity

- Sparks can ignite fuel (e.g. tankers, aircraft)
- Electric shocks
- **Earthing** provides a safe path for electrons to flow to Earth



Electric Fields are the region where a charge experiences a force

- **Field direction** is the direction a **positive charge** would move
- Lines go:
 - away from +
 - toward -
- Stronger field:
 - closer to charge
 - larger charge

