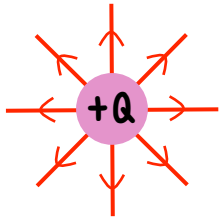
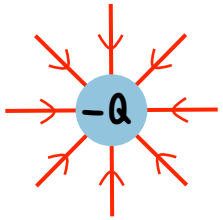
11.1: STATIC ELECTRICITY (Physics Only)

Electric Fields

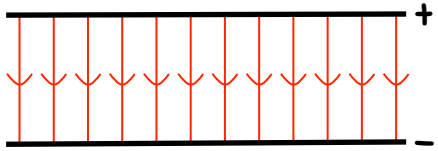
Field patterns



+ve Charge



−ve Charge



Uniform field

Field lines point from +ve to −ve

Direction a positive charge would flow

Non-contact

Electrostatic force doesn't need physical contact

Charges in an electric field experience a force

Charged objects

Charged objects produce an electric field

Dangers of Sparking

Pump & pipes are earthed to prevent sparks

Fuel pumps

Charge builds as fuel flows through pipes

Due to friction

Charge build up could result in spark

Fire hazard in presence of fuel

Earthing

Path to allow exceeds charge build ups to escape

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11.2: STATIC ELECTRICITY (Physics Only)

Charging Insulators

Transfer of electrons
- Rubbing insulators transfers electrons

Perspex rod
- Charged by rubbing with a cloth
- Will attract small pieces of paper

Balloon
- Rubbing a balloon with a cloth charges it
- Charged balloon will stick to wall
- Balloon repels same charges on the wall, leaving opposite charges
- Opposite charges on balloon and wall attract

Equally and oppositely charged
- Object losing electrons becomes positive
- Object gaining electrons becomes negative

Attraction
- Opposite charges attract

Repulsion
- Same charges repel

Electrostatic Phenomena

Electric shocks
- Touching a charged object while earthed, may cause electrons to flow
- Charged objects loses its excess electrons
- Results in an electric shock

Insecticide sprayers
- Particles are equally charged as they leave spray
- They spread evenly since particles repel each other

Lightning
- Electrostatic charge builds up in clouds
- When the charge is too large, it is earthed via the air
- Results in lightning strikes

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