Edexcel IGCSE Physics

2 - Electric Charge (Physics Only)

Flashcards

How does an insulator build static charge?

How does an insulator build static charge?

- When two insulators are rubbed together, friction causes negatively charged particles (electrons) to be transferred from one material to the other.
- The material that loses electrons becomes positively charged since there are fewer negative than positive particles.
- The one that gains electrons becomes negatively charged.
- Their charges are equal but opposite, since they lose/gain an equal amounts of electrons.

How do opposite charges interact?

How do opposite charges interact?

The charged objects are attracted to each other, i.e. an electron and a proton will attract.

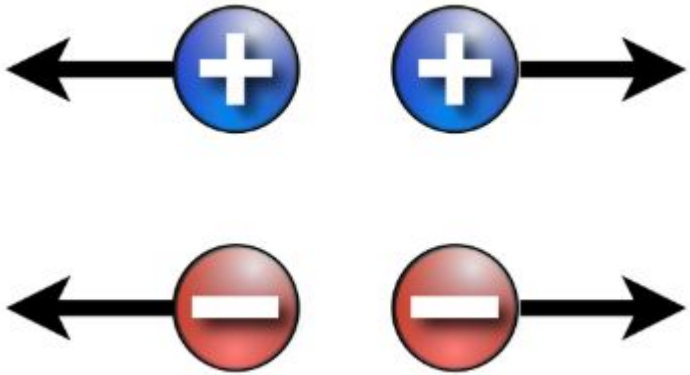
So a negatively charged object attracts a positively charged object. (vice versa since Newton's 3rd Law)

How do like charges interact?

How do like charges interact?

Like charged objects repel each other

So two negatively/positively charged objects repel each other



Why do we feel an electric shock?

Why do we feel an electric shock?

When an object builds up an electrostatic charge, it needs to be ‘earthed’ via a conductor . This is so that either excess electrons can flow to the earth or electrons can flow from the earth into the object to even out the charge. This discharge when experienced by humans is known as an electric shock. This can also occur if you touch a charged object whilst you are earthed.

Why does lightning occur?

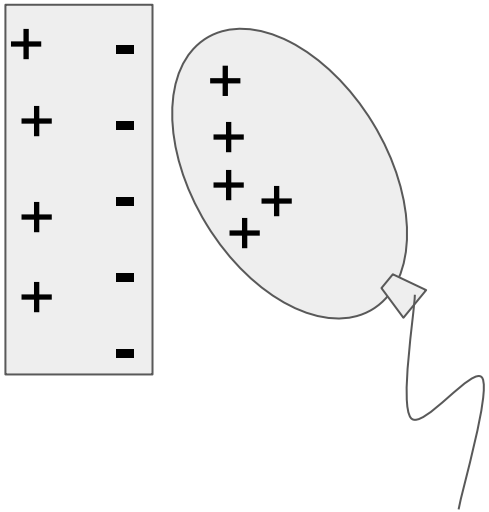
Why does lightning occur?

- Clouds can build up an electrostatic charge due to friction.
- When this charge becomes large enough the clouds discharge via the air to the earth.
- This is known as lightning.

Why does a charged balloon stick to the wall? (for example a positively charged balloon)

Why does a charged balloon stick to the wall?

For a positively charged balloon, when placed next to a wall the positive charges inside the wall get repelled to other parts of the wall. This leaves an area of the wall with a negative charge, which attracts the positively charged balloon towards the wall, making the balloon stick.



How can a comb be used to pick up paper pieces?

How can a comb be used to pick up paper pieces?

A comb can be rubbed against an insulator (for example hair when combing) causing it to pick up an electrostatic charge, due to a transfer of electrons. The charged comb repels the like-charged particles in the neutral paper, leaving the oppositely charged particles closest to the comb. This end of the paper is then attracted to the comb.

How does earthing remove excess charge?

How does earthing remove excess charge?

It provides a path with a low resistance for the electrons to flow either from the device or towards the device to reduce the charge build up.

How are electrostatic charges used in everyday situations to prevent dangerous build up?

How are electrostatic charges used in everyday situations to prevent dangerous build up?

Paint spray is electrostatically charged, meaning when it is sprayed it will attract to the object. Similarly as each paint particle has the same charge, they will repel each other meaning the paint will spread out. This means that less paint is wasted.

How does static electricity cause danger when fuelling cars?

How does static electricity cause danger when fuelling cars?

- Static charge can build up due to the friction between the pipes and the fuel flow
- When the charge builds up, a spark may be discharged
- The spark could start a fire if it reacts with the flammable fuel
- This is resolved by earthing the vehicle and pump