



Textbook

9 Electricity

9.1 Electrostatic phenomena

- 1 An atom is neutral because it contains the same number of positively-charged protons as negatively-charged electrons.
- 2a negative
- b positive
- c Attract because a charged polythene rod becomes negatively-charged.
- 3 Metal is a conductor, it becomes charged but because metal is a conductor the extra electrons flow through the metal and your hand to the earth.
- 4 She is not correct – the rod repel when they have similar charges which are the same across the whole of the rod, two negatively-charged rods would repel whichever ends or you placed next to each other.

9.2 Dangers of electrostatic phenomena

- 1 Lightning is a spark of negative charge as it travels to Earth.
- 2 Earthing is the process of connecting something to the Earth by a conductor, so that charge can flow through the conductor to Earth and prevent a dangerous build-up of negative charge.
- 3 An engineer's wristband acts as an earth as it conducts any build-up of charge away from components they may be working on. If the charge was not conducted away, then it could flow through the components and damage them.
- 4a No
- b A plastic handle is an insulator. She gets a shock from the metal handle because the charge that she has built up by walking across the carpet sparks through her hand to door handle to Earth.

Workbook

9 Electricity

9.1 Electrostatic phenomena

1a positive, negative, electrons

b conductors iron

c insulators, plastic

2a positively charged

b The diagram shows more positive symbols.

c minus

d the paper will be attracted to the rod if it is negatively charged

e The paper has an opposing charge to the rod, so it will be attracted to the rod.

3a i positive

ii The paint will be attracted to the car.

iii It is cleaner and more efficient as the paint is attracted to the car and will not go everywhere.

b positive

9.2 Dangers of electrostatic phenomena

- 1a** the process of connecting objects to the ground
 - b** a flash of light you see when the air conducts electricity
 - c** the flow of electric charge
 - d** the probability of something happening and the consequences if it does
- 2a** As the petrol moves through the nozzle electrons are transferred.
- b** A spark could ignite the petrol.
 - c** The nozzle is earthed through the car.
 - d** It will earth the nozzle allowing charge to flow away.
 - e** Earthing the nozzle reduces the risk to drivers and cars of petrol igniting and exploding by conducting away the charge.
- 3a** A lightning conductor will carry any charge from lightning to the ground avoiding damage to the building.
- b** If lightning strikes your car it will be conducted to the earth, but if you are outside and lightning strikes you it will harm you severely.