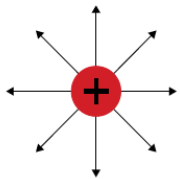


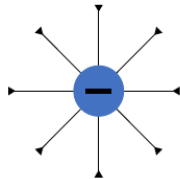
**1. Electric Fields** Any electrically charged object emits an electric field. These electric fields can exert a force on other charged particles.

We represent fields as a series of lines. This is shown below for positive and negative charges below. The lines have arrows showing the direction that a positive charge moves in as a result of the field.

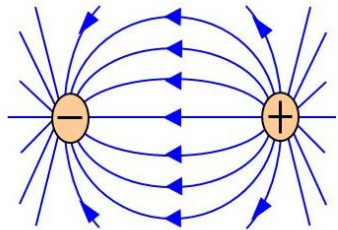
**Electric Field Patterns**



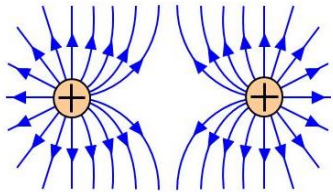
The field lines are showing with arrows going away from the positive charge.



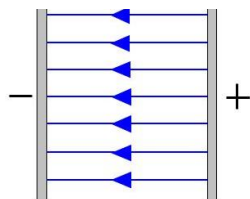
The field lines are showing with arrows going towards the negative charge.



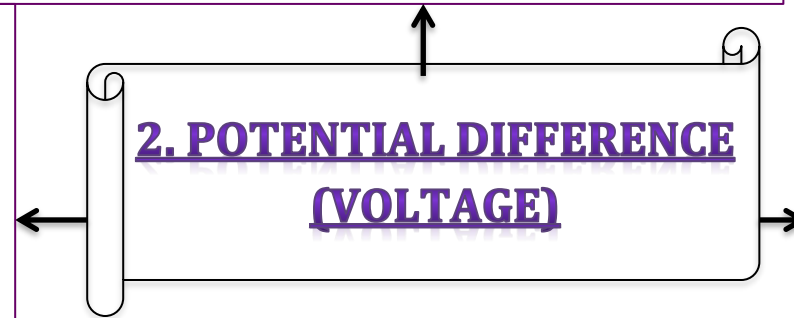
The positive charge would be attracted towards the negative charge, so the arrows point towards it.



A positive charge would move away from the positive charge as like charges repel.

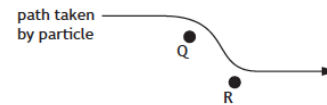


Two metal plates parallel to each other and separated by an insulator. Positive charge anywhere between the two plates will be attracted towards the negative plate and repelled from the positive plate.



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12. An electric field exists around two point charges Q and R. The diagram shows the path taken by a charged particle as it travels through the field. The motion of the particle is as shown.



Which row in the table identifies the charge on the particle, the charge on Q and the charge on R?

	Charge on particle	Charge on Q	Charge on R
A	positive	negative	negative
B	negative	negative	negative
C	negative	positive	positive
D	positive	negative	positive
E	positive	positive	negative

**2. Potential Difference (voltage)**

For current to flow in a circuit, charges in that circuit must be moving. For them to move, they need to be given energy. As current flows round a circuit, each coulomb of charge gains energy in the supply and this is transformed in the components of the circuit.

**Potential difference (voltage) of the supply is a measure of the energy given to each coulomb of charge in a circuit.**

There is a formula for this (Higher) – useful to explain definition:

$$E = QV$$

$$V = \frac{E}{Q}$$

$$1 \text{ volt} = \frac{1 \text{ joule}}{\text{coulomb}}$$

**One volt is defined as one joule per coulomb.**