| Strand	Electrostatics
Sub Strand	Charge
Content Learning Outcome	At the end of the lesson students should be able to • demonstrate knowledge of the elementary structure of the atoms.

Electrostatics

i.   There are two types of charges

a. Positive charge i.e a body that has lost electrons
b. Negative charge i.e a body that has gained electrons.

ii.   All bodies can be charged by rubbing or by friction
iii.   Equal but opposite type of charge is generated by rubbing
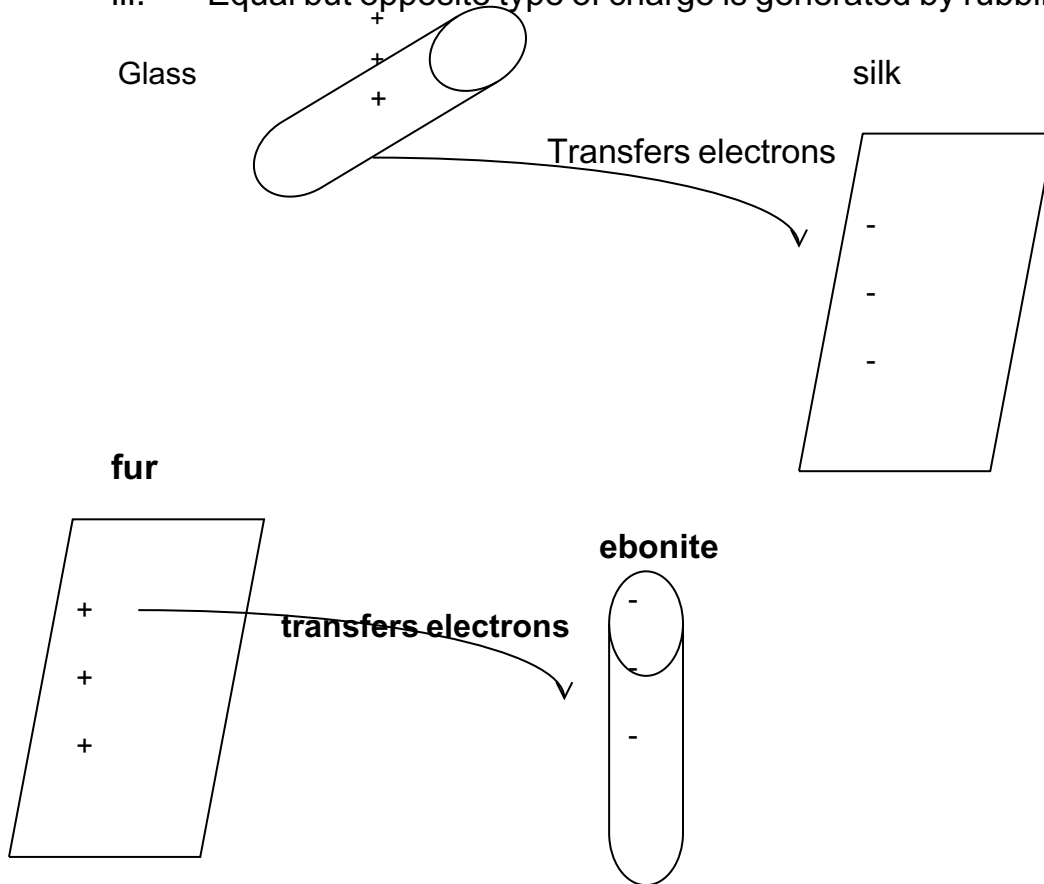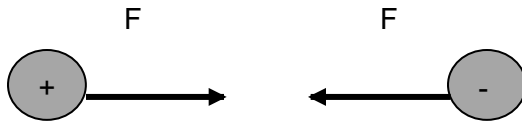
Force between two charges

1. Force between two like charges is repulsion
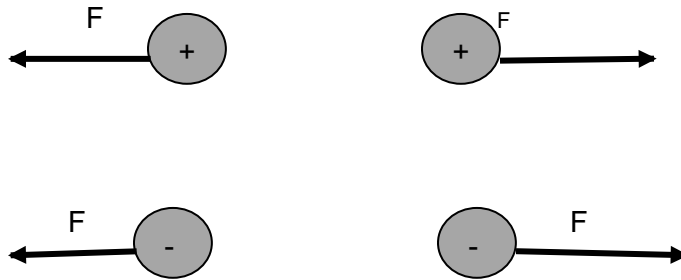
2. **Force between two unlike charges is attraction**

3. **The size of the force is given by coulombs law**

$$F = \frac{k\,Q_1\,Q_2}{d^2}$$
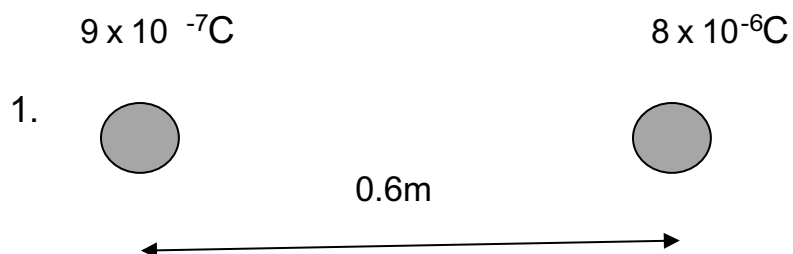
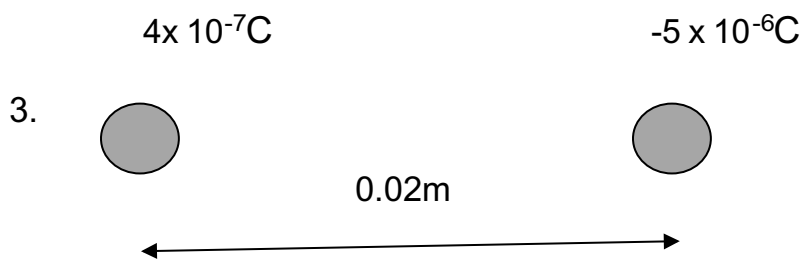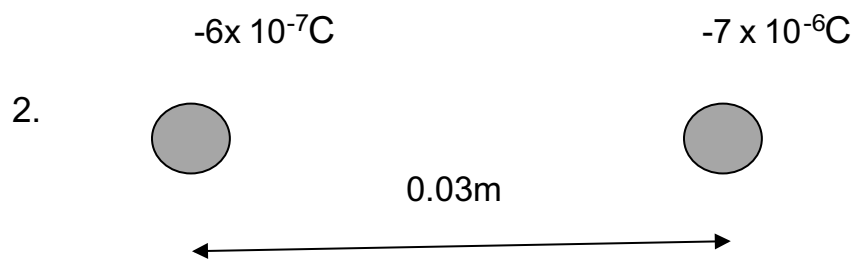k- is a constant $9 \times 10^{9}\ Nm^2/C^2$

Q_1 and Q_2 are the charges in coulombs C

d- is the distance in between the charges in m

Force is a vector quantity

Find the force between the charges shown

$9 \times 10^{-7} C$ $8 \times 10^{-6} C$

1.

0.6m

-6x 10^{-7}C   -7 x 10^{-6}C

2.

0.03m

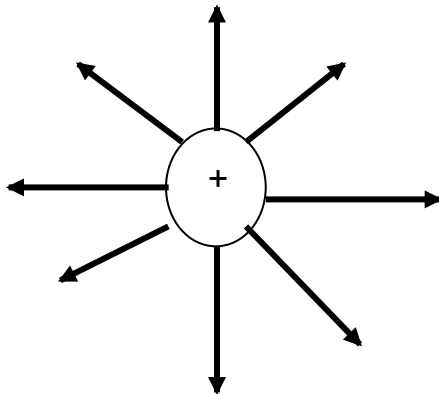4x 10^{-7}C   -5 x 10^{-6}C
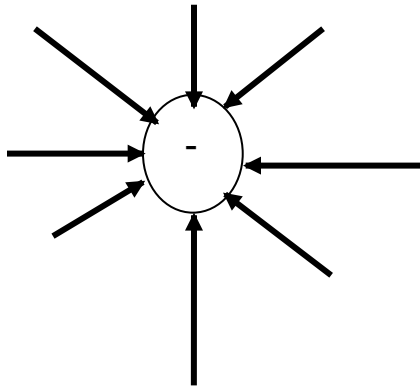
3.

0.02m

Electric field

Electric field is a vector quantity. It is a region where a charge experiences a force.

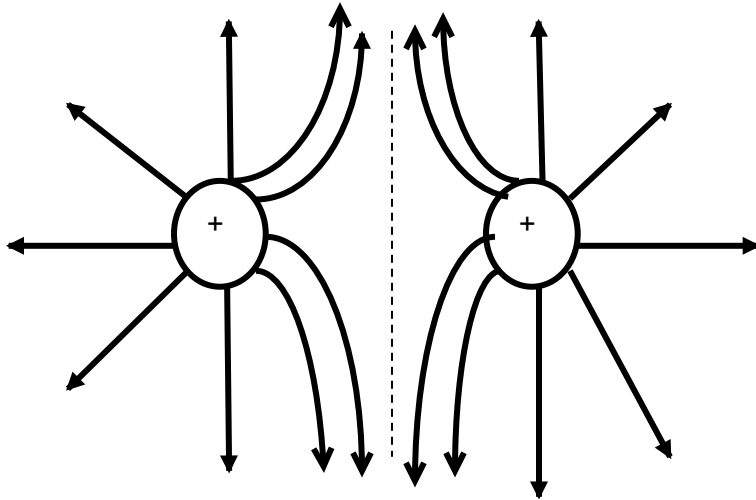**a. For a positive charge it is radially outwards**
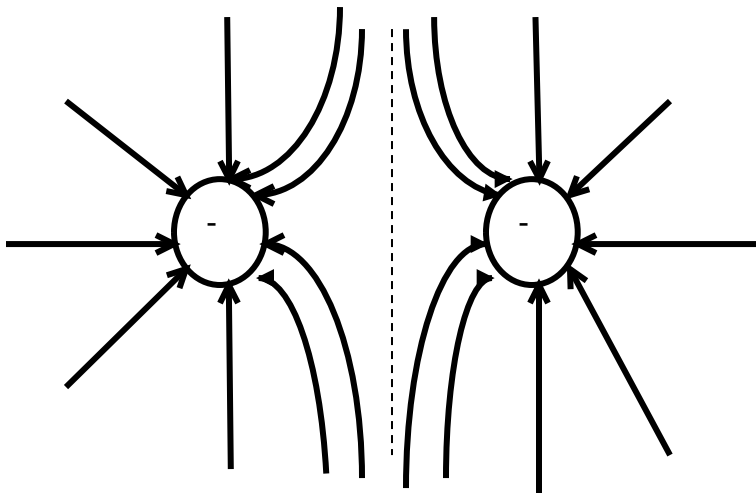
b. For a negative charge it is radially inwards
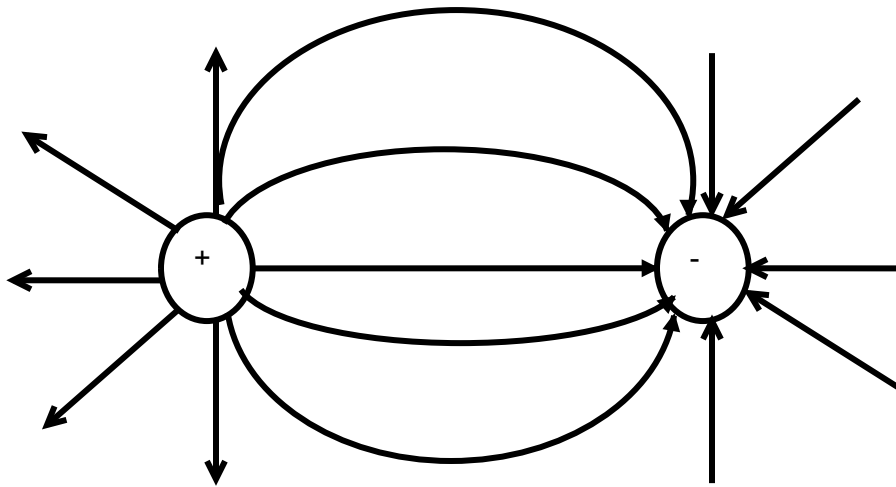

c. Two like charges placed close together

    i.   Two positive charges

    ii.   Two negative charges

d. Two unlike charges placed close together

Electric field lines are called lines of force. The spacing in between the lines gives the strength of the electric field.

Less spacing – strong field

More spacing – weak field

The electric field away for a charge is given by the formula

$$E=\frac{kQ}{d^2}$$
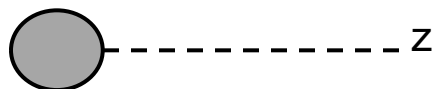
Find the electric field at point z as shown

E is the electric field in N/C
k- 9 x 10^9 Nm^2/C^2
d- distance in m

1.   7 x 10^{-10}C

0.4m

2. $-6 \times 10^{-9}C$

0.8m

                            Z

3. $4 \times 10^{-10}C$

0.9m

4. $-7 \times 10^{-10}C$

0.04m

Z