Objects become charged because they gain or lose electrons. An object's net charge can be found if you know how many electrons are gained or lost by:

$$q = Ne$$

where: q = charge (C)
N = number of elementary charges
e = elementary charge
$= 1.60 \times 10^{-19}$ C

ex. What is the charge on an object that has gained 2×10^{15} electrons?

ex. How many electrons were lost if an object has a charge of 1C?

As with masses, we can find the force between two charges.

Coulomb's Law

The force between two charges is directly proportional to the product of the charges and inversely proportional to the square of the distance between them.

where: q_1 and q_2 = charges (C)
r = distance between charges (m)
k = Coulomb's constant
= 9 X 10^9 Nm^2/C^2

Unlike with masses, forces between charges can be attractive or repulsive (masses just have attractive forces).

if F is –, it is an attractive force (opposite charges)
if F is +, it is a repulsive force (like charges)

ex. Find the force between a 6 μC charge and a 3 μC charge that are 30 cm apart.

As with masses, this electric force acts on both charges the same (even if the charges are different in magnitude). The charges will accelerate at different rates if they are different masses (a = F/m).

ex. Find the force between an object that has lost 1000 electrons and an object that has gained 20 000 electrons if they are 2 m apart.

Find the new force using ratios.

ex. If the force between two charges is 5 N, what is the new force if the first charge is doubled and the distance between them is cut in half?