

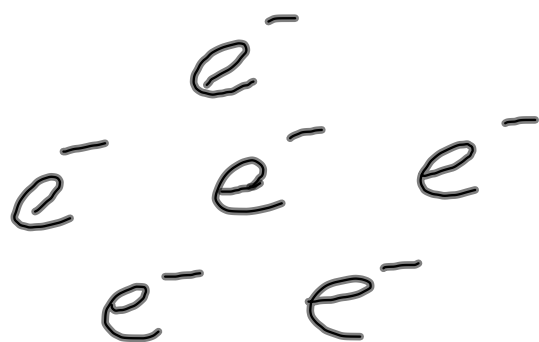
## **Electricity!**

Electricity is a force caused by electrical charge

Electrical Charge comes from charged particles: Protons and Electrons

Charge is measured in Coulombs (C)

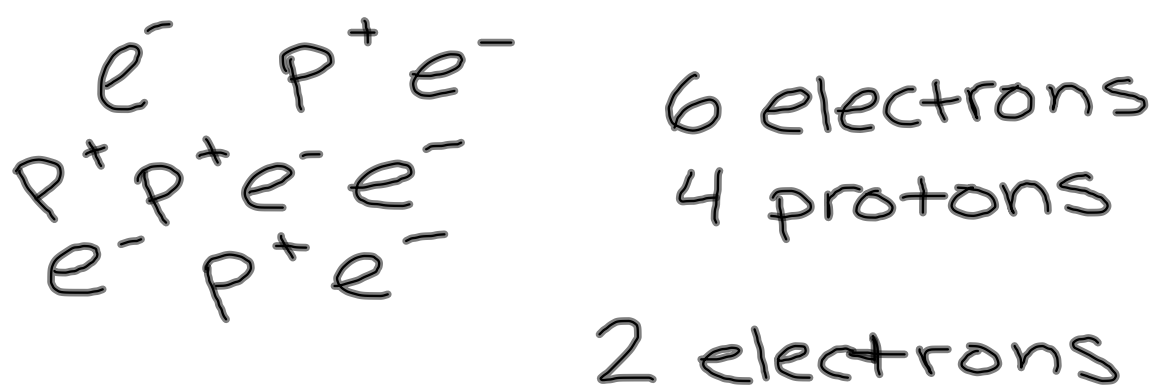
Electrical Charge:      Protons=+q  
   electrons=-q  
    $q = 1.60 \times 10^{-19} \text{ C}$



6 electrons

$$q = -6q_e = -6 \cdot 1.6 \cdot 10^{-19} \text{ C} =$$

$$q = 9.6 \cdot 10^{-19} \text{ C}$$



$$q = -2(1.6 \cdot 10^{-19} \text{ C})$$

$$q = -3.2 \cdot 10^{-19} \text{ C}$$

These charged particles cause a force:  
the electrostatic force

electrostatic force: force due to the  
positions of charge particles.  
Like charges repel. Unlike Charges attract.

# Coulomb's Law

$$F = k \frac{|q_1| |q_2|}{r^2}$$

$$k = 8.99 \cdot 10^9 \frac{\text{Nm}^2}{\text{C}^2}$$

## Coulomb's law

$$F = k \frac{|q_1| |q_2|}{r^2}$$

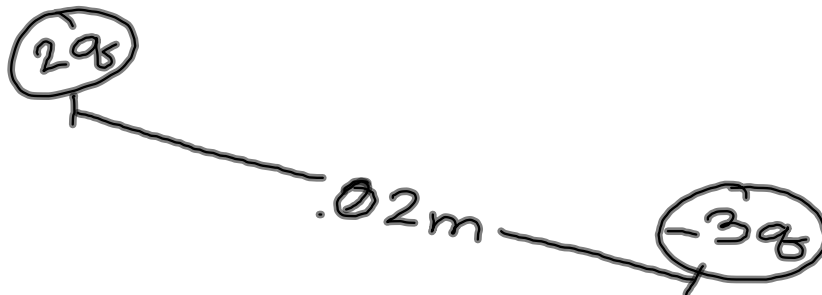
$F$  = force

$k$  = Coulomb's constant

$q$  = charge

$r$  = distance between charges

Constant  $k = 8.99 \times 10^9 \text{ N} \cdot \text{m}^2 / \text{C}^2$



attractive force:  
because they are  
opposite signs.

$$F = \frac{k |q_1| |q_2|}{r^2} =$$

$$F = \frac{(8.89 \cdot 10^9)(2)(1.6 \cdot 10^{-19})(3)(1.6 \cdot 10^{-19})}{(.02)^2}$$

$$F = 3.4 \cdot 10^{-24} \text{ N}$$