

Source: [KBhPHYS201IntroToElectrostaticsLN](#)

## 1 | Coulomb's Law

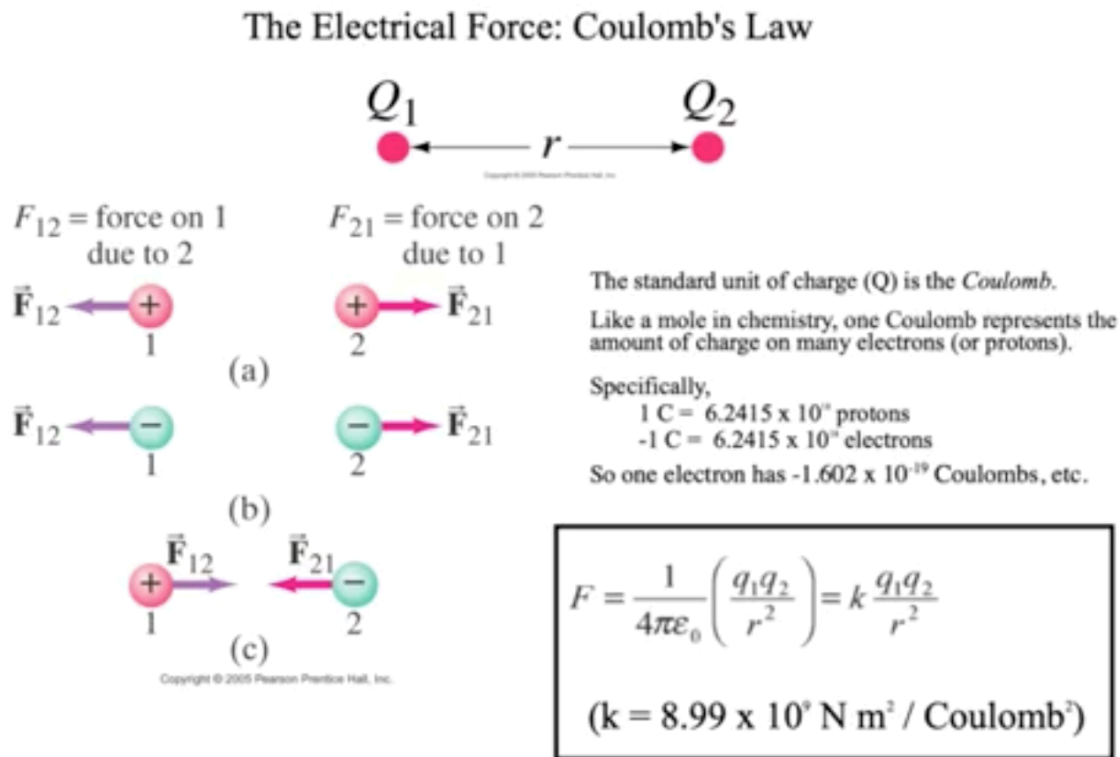


Figure 1: Screen Shot 2020-08-24 at 7.40.48 PM.png

- Electrical forces gets stronger as charge increases
- Electrical forces gets weaker as charge decreases

The magnitude of force that a particle,  $q_1$ , has upon another  $q_2$ , is given by the Coulomb's law

Definition 1 · **Coulomb's Law**  $k \frac{q_1 q_2}{r^2}$

where  $k$ , a constant for change,  $q_1$ , change of first particle,  $q_2$ , change of second partical,  $r^2$ , distance squared

Note! The Standard Unit of Charge (Q) is the Coulomb — a representation for change for many electrons or many protons

**Remember this!**

Definition 2 · **Charge of an Electron**  $-1.602 \times 10^{-19} \text{ Q}$

Definition 3 · **k**  $8.99 \times 10^9 \frac{\text{Nm}^2}{\text{Q}^2}$

E.M. forces, really, are two forces interacting with each other

**Notice! Be careful with the signs when applying coulombs law**

- If resulting Coulomb force  $> 0$ , force is REPULSIVE (became you multiplied positive to positive or negative negative)
- If resulting Coulomb force  $< 0$ , force is ATTRACTIVE (became you multiplied positive to negative)

Coloumb's law could be applied when modeling [KBhPHYS201ElectricFields](#) Electric fields to see how particles interact and how they influence each other.

## Guided Problem Solve

Special care must be taken for solving these problems w.r.t. to both vector direction and multiple-atom-interactions [KBhPHYS201GuidedProblemCoulomb](#)

## Here's something! DNA Replication

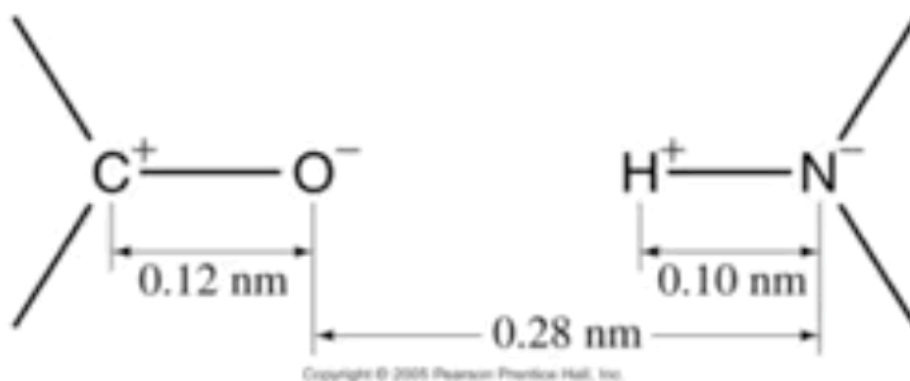


Figure 2: Screen Shot 2020-08-24 at 8.20.15 PM.png

The question is... Between these four atoms, *how many do we need to calculate to find if these two repel or attract?*

This is fairly simple. Because of the fact every force between each pair of atoms between these two elements needs to be calculated. So... 2 (on the left) times 2 (on the right) = 4.

If these repel, the don't combine. If they attract, of course they do.