Source: [KBhPHYS201IntroToElectrostaticsLN]

1 | Coulomb's Law

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

The magnitude of force that a particle, $q1$, has upon another $q2$, is given by the Coulumb's law

Definition 1 · **Coulumb'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** $-1.602 \times 10^{-19} Q$

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

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

Notice! Be careful with the signs when applying coulumbs 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

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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.