Coulomb's Law

$$F_e = \frac{K \times |q_i \times q_j|}{r^2};\ K \approx 9 \times 10^9 \frac{Nm^2}{C^2}$$

F_e: Electric force;
K: Coulomb's Constant;
$(q_i,\ q_j)$: Charges of i and j;
r: Distance between i and j;

Law of conservation of charge

$$\sum q \text{ Is always constant}$$

Electric fields

An electric field makes it possible for a charged body to exert electric force to another charged body;

$$||\vec{E}_i|| = \frac{K \times |q_i|}{r^2}$$

$\vec{E}$: Electric field;
r: Distance between i and a certain point in space;

Note: The direction of $\vec{E}$ is determined by value of the charge. Negative charges exert a converting field and positive charges exert a diverting field;

Electric potential energy

The interaction between charged bodies create an electric potential energy that can be converted to work;

$$U_e = \frac{K \times q_i \times q_j}{r}$$

U_e: Electric potential energy;
r: Distance between i and j;

Electric potential

Placing a charged body in space causes all the points in that space revolving that charge to assume numbers. Those numbers are the potential in that point and they make it easier to calculate the U_e of that same point when another charged body is placed there;

$$V_i = \frac{K \times q_i}{r}$$

Ohm's Law

$$U = R \times I$$

U: Voltage;
R: Resistance;
I: Electric current;

Note: The resistance of a wire can also be calculated by:

$$R = \frac{\rho \times L}{A}$$