Electricity II

Formulas

$$\Delta V = \frac{\Delta U_E}{q} = \frac{W_E}{q}$$
$$\Delta V = -F * \frac{\Delta s}{q}$$
$$\Delta V = -E * \Delta s$$
$$\Delta V = -E * \Delta s * \cos(\alpha)$$
$$E = -\frac{\Delta V}{\Delta s}$$
$$\Delta V = k * \frac{q}{r}$$

$$\vec{F} = k \cdot \frac{|q_1| \cdot |q_2|}{r^2} \; where \; k = 9 \cdot 10^9$$

$$\Delta U = \Delta V * q$$
$$if \; r = \infty \; then \; V = 0$$

Units

$$Volts = \frac{Joules}{Coulomb}$$
$$V = \frac{J}{C}$$
$$Current = \frac{Coulombs}{Second}$$
$$\rightarrow 1A = 1\frac{C}{s}$$

$$1\mu C = 1 * 10^{-6} C$$
$$1nC = 1 * 10^{-9} C$$

Principles

> If electric potential maps were topo maps, positive charges have to “roll” from high points to lower points (or respective potential) in order to create useful energy. The same applies for negative charges where it is vice versa.

> If one walks along electric-field-lines, the potential decreases.