# Energy Part 1:

The universe is composed of matter
- elements, atoms, molecules, and compounds

Energy is the capacity to do work or supply heat
- SI Unit for Energy = Joules
- Potential e. (position) = stored → could do something.
- Kinetic e. (motion) = ↑ temp. then motion of molecules ↑

ENERGY PERSPECTIVE

! energy that results from interactions between charged particles.

Tendency of universe towards lowest energy.

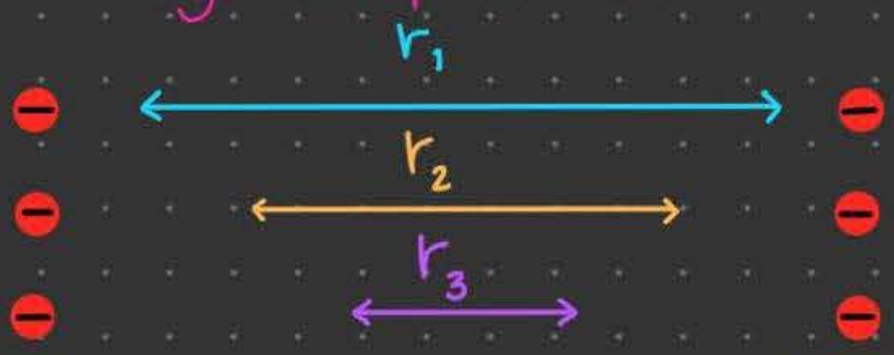
$\Delta E = E_f - E_i$

Ex. Think about dropping a ball. Highe. when held up high. Lowere. once dropped.
(Ball = system)
- gave up energy.
  * negative $\Delta$, spontaneous

*systems cannot spon. gain energy, needs source

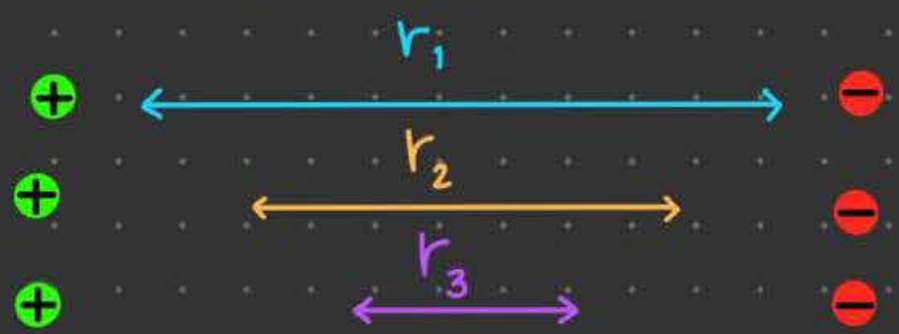
# Energy Part 2:

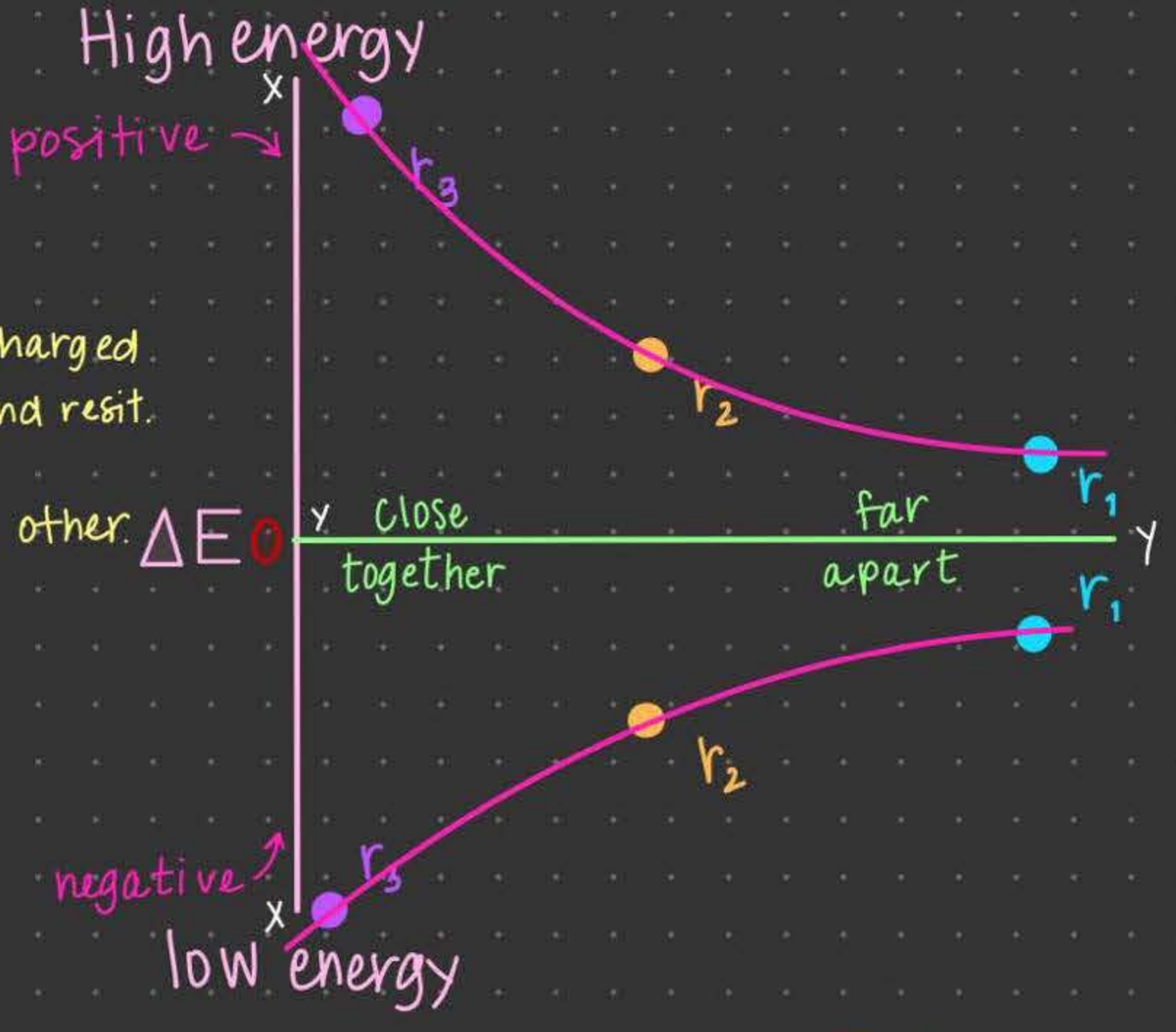
→ magnet experiment:



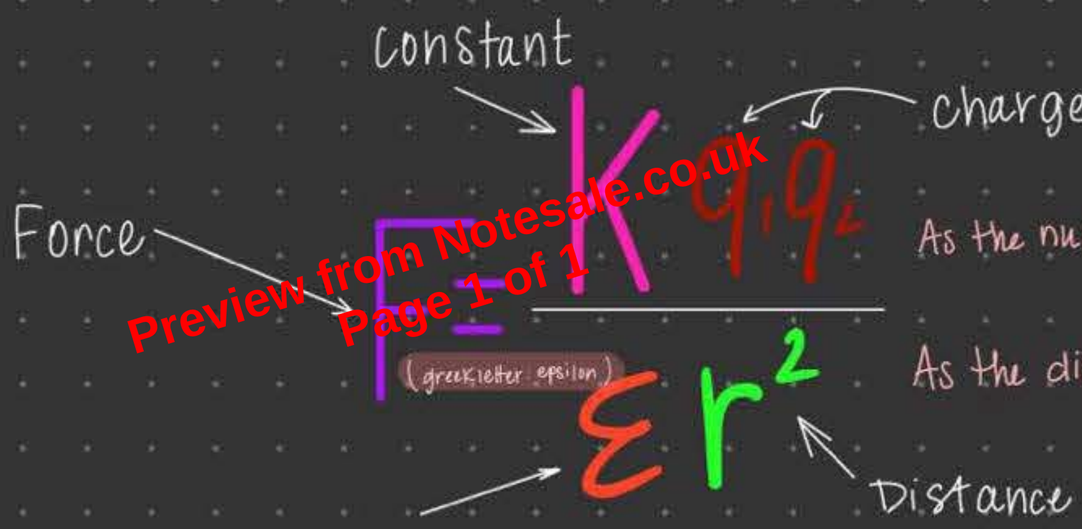

The energy in the system increases as liked charged molecules get closer together. Naturally, they repel and resit. nature moves to low energy ($r_1$ not $r_3$).

Like charged particles want to be close to each other. The energy system decreases as r decreases. Here nature pulls opposites together making $r_3$ the lower energy state over $r_1$.




# Coulomb's Law:




As the numerator increases so does the force.

As the distance decreases so does force.

Energy → $E = \alpha \frac{q_1 q_2}{\varepsilon r}$

repulsive: particles have same charge.
attractive: particles have opposite charges.