

Source: [KBh20phys250ElectricFields](#)

#ref #incomplete

1 | Voltage

- Units: $\frac{Nm}{C} = \frac{J}{C} V$
- Amount of energy per unit of charge it takes to bring that charge to that point
 - If you have a ball and you are taking it up the hill, then it takes energy to do that
 - When you let go, it will roll back down the hill
 - Voltage = energy per charge is similar to energy per kilogram of raising the ball.
 - Field is the amount that it is resisting—the amount of force required to move the charge.
 - **Analogous to gravitational potential energy.**

Zero Point

- If you have one positive and one negative, then the zero point of the voltage is between the two charges
- The zero can be defined anywhere, just like zero gravitational energy can be anywhere
 - However, conventionally, we define zero to be between two opposite charges
 - We also define the voltage infinity distance away to be zero

Equipotential

- A line that shows where voltage is the same [srcPhETChargesFieldsEquipotentialLines.png](#)
 - Joules of electric potential energy
 - Scalar, while electric field is a vector ### Relationship with Electric Field
 - Perpendicular to the electric field
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