- How does Q_1 know Q_2 is there?

  Q_2 produces an electric field $E(r)$ such that $F = Q_1 E(r)$

  for a single point charge Q_2

  $E = \frac{1}{4\pi\epsilon_0}\frac{Q_2}{r^2}$ so $\quad F = \mathrm{qE}(r)$ recovers coulomb$'s$ law.

- E is a vector field, which basically means there is a point defined at every position in the field

  Notes

  i. units: $\frac{\text{Newtons}}{\text{coulomb}} \Rightarrow \frac{N}{c}$

  ii. vector field at every point in space, there is a vector E defined

  iii. Superposition! $E = E_1 + E_2 + ...E_n$

  Vector Sum for discrete sources

  Integral for continious discrete of charges.

- Field lines start on positive charges and end on negative charges

- Field strength indicated by the spatial density of lines