Electric fields

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- Objects can have an electrical charge, electrons = negative, protons = positive
- electrons can be transfered from one object to another
- protons can not be transfered from one object to another
- **opposites attract, like repel**

Coulomb's law

the force between two point charges is inversely proportional to the square of the distance between the charges. Additionally it is directly proportional to the product of the charges.

$F_e = \frac{kq_1q_2}{r^2}$

where q is charge, k is coulombs constant, r is radius and F_e is the force of repulsion

- charge is measured in Coulombs C
- one electron has a charge of -1.6×10^{-19}

Superposition Principle

this suggests that the net force acting on a given point is the sum of all forces acting on the particle

When a charged particle is experiencing more than one electrical force then the net force acting upon it is the sum of all the electrical forces acting on it.

homework

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Electric fields

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- can be described mathematically. the letter epsilon ϵ denotes the field strength

q is charge, epsilon is field strength

$$\vec{F_e} = q\vec{\epsilon}$$

k is electron constant, q is charge, ra is radius

$$\epsilon = \frac{kq_2}{r^2}$$

Electric Field Strength

a given point in the electric field, the strength is the sum of teh field strengths form each point source. The default test charge is positive

WHat is the field strength at a point which is 5 cm south of cha 2 C charged object 4cm away directly west of another charges object -1.5 C

Field Lines

- we always draw arrows away from positive charges and towards negative charges
- fields are 3 dimensional, but we draw them two dimensionally

electric dipole

- a pair of equal in magnitude but opposite in charge electric charges separated by a small distance

the direction of the lines indicates the direction of the electrical source

Field Interactions

when electric fields of two similarly charged particles interact they deflect each other, otherwise they interact / merge

when electric fields from two unequal charged objects interact the object with the greater charge has a larger influence on the resulting field **If fields are unbalanced the lesser field should have fewer lines**

how much things are deflected, which one is stronger,

Uniform electric fields

the electric field between two charged plates can function as a uniform electric field. this field is functionally uniform in direction and magnitude

Practice

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