§14-2 Describing Fields

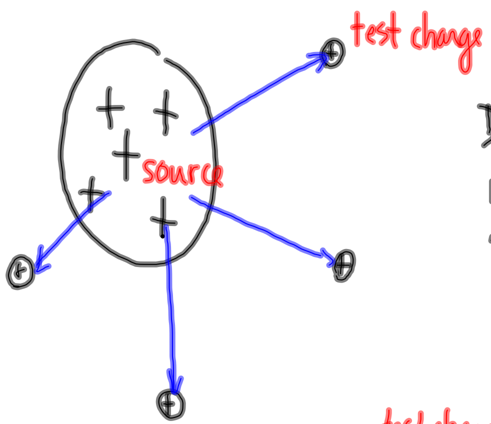
Electric Field Intensity/Strength → bascially the force per unit charge.

$\vec{E}$ also seen like this $\vec{E} = \frac{\vec{F}_Q}{q}$ (a vector quantity)

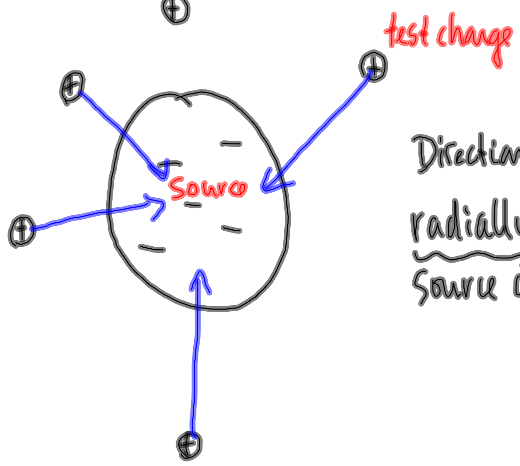
↓ the direction of the field will be the same as the direction of the force.

magnitude ⇒ $|\vec{E}| = \frac{|\vec{F}_Q|}{q}$

To determine the direction of the field imagine placing a positive test charge near the source charge. The direction of the field is the same as the direction of the force experienced by the positive test charge.



Direction of the field is radially outward if the source charge is positive.



Direction of the field is radially inward if the source charge is negative

MP|645

$q_t = +2.0 \times 10^{-9} C$

$\vec{F} = 4.0 \times 10^{-9} N$ [W]

a) $\vec{E} = ?$

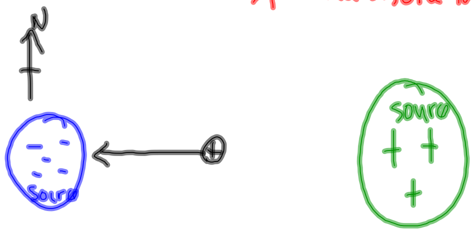
b) $\vec{F_Q} = ?$ if $q = +9.0 \times 10^{-6} C$

a) $\vec{E} = \frac{\vec{F_Q}}{q}$

$\vec{E} = \frac{4.0 \times 10^{-9} N \text{ [W]}}{2.0 \times 10^{-9} C}$

$\vec{E} = 2.0 \frac{N}{C}$ [W]

This means that for every coulomb of positive charge that it will experience a force of 2.0N [W]. If you place a negative charge in the same location, it will experience a force to the EAST!



b) $\vec{E} = \frac{\vec{F_Q}}{q}$

$\vec{F_Q} = q\vec{E}$

$\vec{F_Q} = (9.0 \times 10^{-6} C)(2.0 \frac{N}{C} \text{ [W]})$

$\vec{F_Q} = 1.8 \times 10^{-5} N$ [W]

Gravitational Field Intensity/Strength - the force experienced by 1kg of mass at a certain location (always attractive .... therefore the field is always radially inward)

$\vec{g} = \frac{\vec{F_g}}{m}$ $N/kg = m/s^2$

Do for Thurs:

① PP|646-647

② PP|649 (look at MP|648)