ENG 221 03/11/20
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1) Right now the human body undergoes a uniform gravitational force. It's magnitude is $9.8 m/s^2$ and points straight down. If a mass is thrown in the air, it will follow a parabolic path because of gravity. The horizontal acceleration is zero and vertical acceleration is g. We know this because a free-body diagram only shows mg, from

$$F = mg$$

and the law tells us that

$$mg = ma$$

so, $$g = a$$

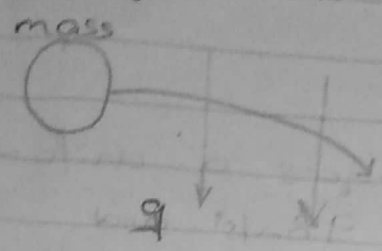
You can say the same thing about charges in a uniform electric field. If a charge is thrown in a uniform electric field, it would also follow a parabolic path. Neglecting gravity, the parabola comes from the constant force experienced by the charge in the electric field. The acceleration is again, 0, in one direction and constant in another. The acceleration can be found by drawing a freebody diagram ($F = qE$) and applying Newton's second law of motion

$$ma = qE$$

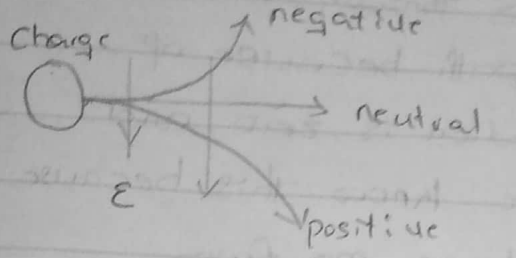
so acceleration is $$a = \frac{qE}{m}$$

The big difference between gravity and electricity is that m, mass is always positive and q the

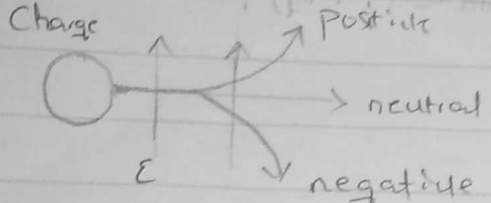
charge can be positive, negative or 0.



motion of a mass in a uniform gravitational field

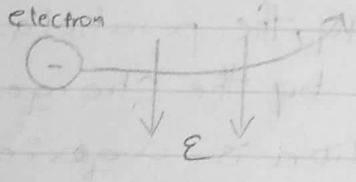


the motion of a charge in a uniform electric field directed ~~to~~ downwards



motion of a charge in a uniform electric field directed upward

For example: If a uniform electric field in a region is directed upwards, and electron is shot horizontally into the region it is;



2) -Electric field

An electric field is said to exist at a point in space if a charged particle placed at the point experiences a force that would not be felt by an uncharged particle. A charged particle creates an electric field. The field acts on another charged object to produce a force.

- Magnetic Field

A charge that is moving in a magnetic field experiences a force ~~that would not~~ perpendicular to it its own velocity and to the magnetic field. Magnetic field are produced by moving electric charges and and instrinsic magnetic moments of elementary particles

- Electric Current

An electric current is a stream of charged particles such as electrons or ions moving through an electric conductor or space.