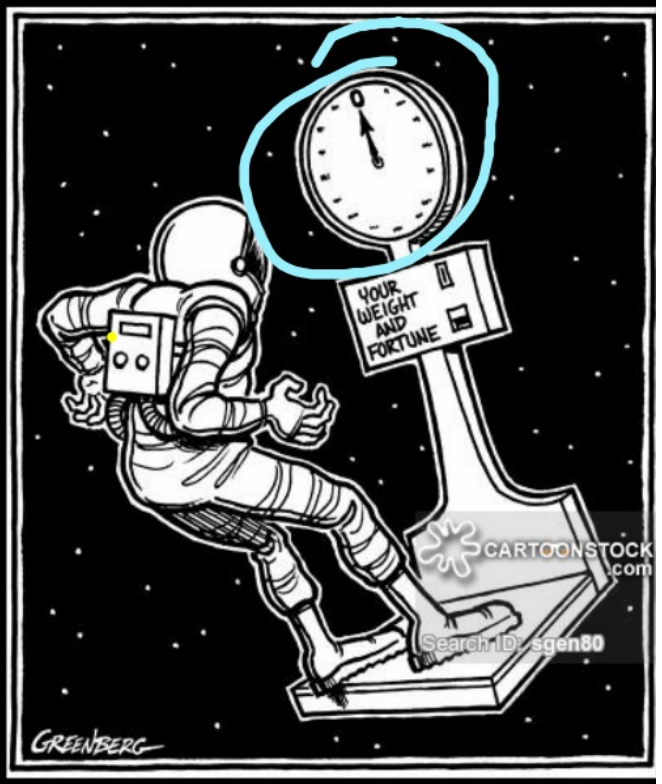
5.18.20

Newton's Laws: Lab, Mass and Weight

Today's Objectives:

- Distinguish between mass and weight
- Calculate metric weight here on Earth



Isaac Newton Fact of the Day:

His early years were pretty unhappy.

History tells that he was not a good student who would excel in studies. He worked as a house cleaner and dishwasher to pay his bills and he liked to keep a journal of his ideas and thoughts.

Newton had written in **his college notebooks about himself**,

"Making pies on Sunday night…
punching my sister…
threatening my Father and Mother Smith to burn them and the house over them.

Mass and Weight are not the same thing!!

(they are mathematically related but are not equal)

MASS

- amount of matter in something
- Unit: kg
- Stays the same on all planets.

WEIGHT

- force of gravity on an object
- Unit: Newtons
- Depends on gravity.

$$F_g = m\,g$$

Fg : Force of gravity (Weight)
N

m: Mass (kg)

g : Gravity (m/s^2)

$g_{Earth} = 9.8$

$g_{Moon} = 1.6$

Sample problem

$$F_g = m_g$$

A physics teacher has a mass of 85 kg.

A) What is his weight in Newtons on Earth? $(85)(9.8) = 833\ N$

B) How hard does the floor push up on him?

↓

equal to weight: $833\ N$

# of Gs = Multiples of Earth's Gravity
"G-Force"

object is
Still = 1G (feel like normal weight)

Gravitron = 2.7Gs (feel 2.7x normal weight)