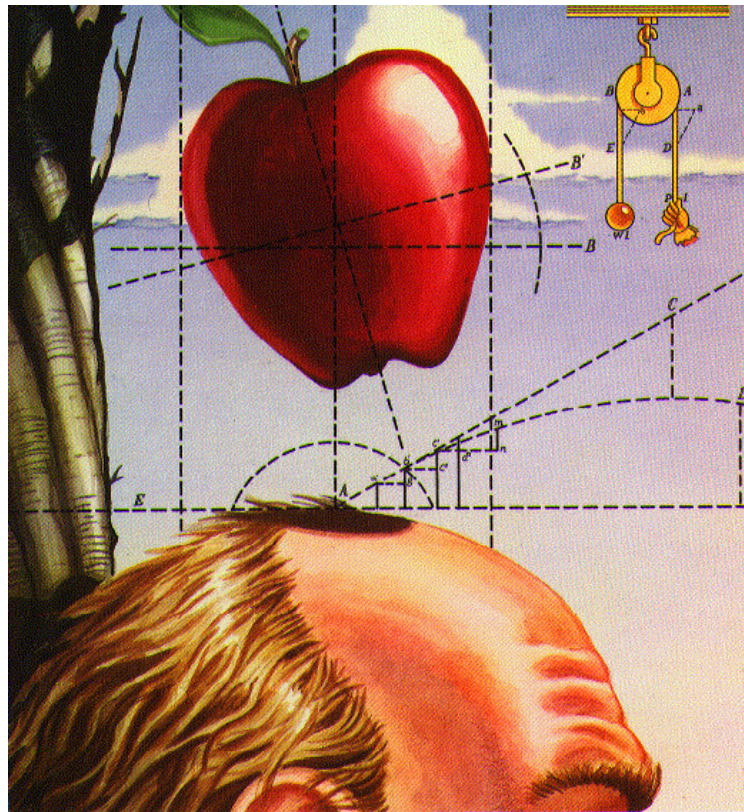# Gravity = the force of attraction between objects
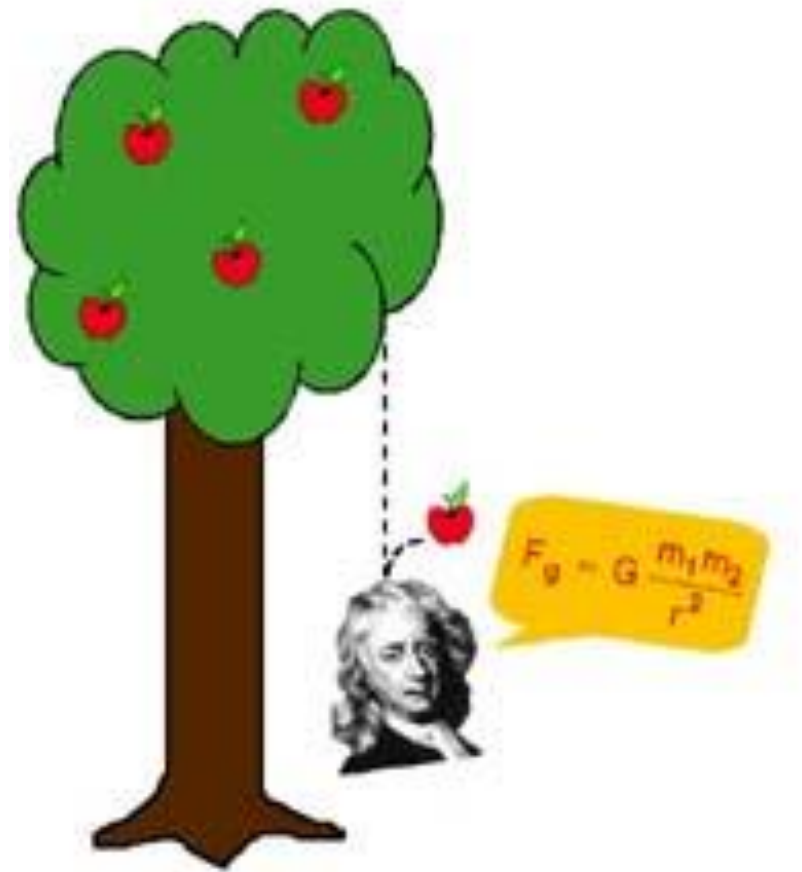
Gravity

$$F = m \times g$$

$$g = 9.81 \text{ m/s}^2$$

Newton & Gravity

- Legend of sitting under apple tree and seeing an apple fall…
  - Newton realized that a force pulled the apple to the ground

Newton's Law of Universal Gravitation

- All objects in the universe are attracted to each other

- All objects exert a gravitational field and attract other objects

Attraction depends on two things:

Mass …the more mass, the more attraction

Distance …the greater the distance between them, the less the attraction

Law of Universal Gravitation

Every object in the Universe attracts every other object with a force directed along the line of centers for the two objects that is proportional to the product of their masses and inversely proportional to the square of the separation between the two objects.
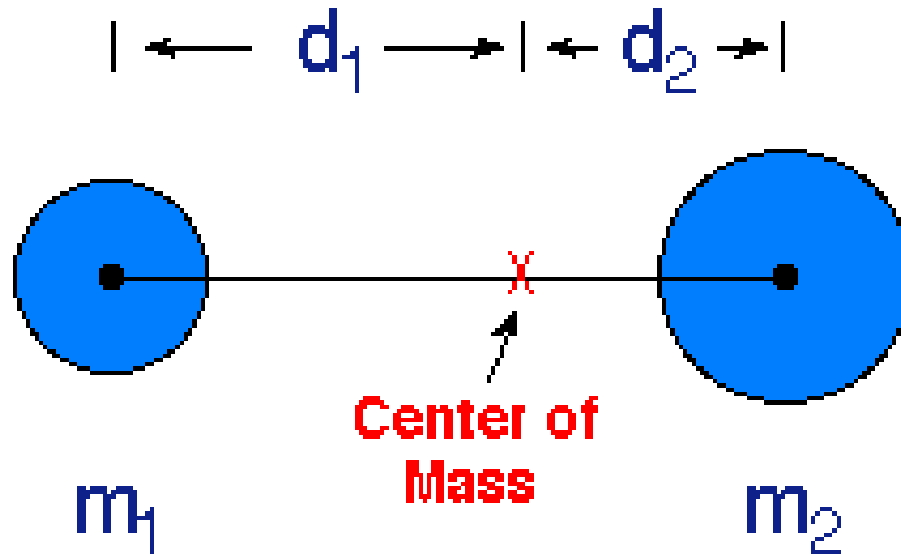
$$F_g = G \frac{m_1 m_2}{r^2}$$
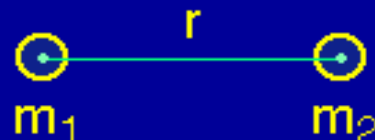
F_g is the gravitational force

m_1 & m_2 are the masses of the two objects

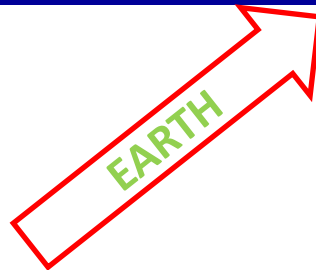r is the separation between the objects

G is the universal gravitational constant

Gravity between 2 planets

$$F_g = G \frac{m_1 m_2}{r^2}$$

EARTH

$$F = m \times g$$