Newton's Law of Universal Gravitation

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

$G = 6.67 \times 10^{-11} Nm^2/kg^2$
m_1 = mass in kg of one object
m_2 = mass in kg of other object
r = distance between their centres

Every particle in the universe attracts every other particle with a force that is proportional to the product of their masses and inversely proportional to the square of the distance between them. This force acts along the line joining the two particles.

1. **At the surface of the earth the force due to gravity can be calculated by using F = mg. The force due to gravity can also be calculated using the above formula. Equating the two results in the following:**

$$mg = \frac{Gm_1 m_2}{r^2}$$

$$g = \frac{Gm}{r^2}$$

Example 5-14 page 128: Calculate the value of "g" on the top of Mt. Everest, 8848m above the Earth's surface.

$$g = \frac{Gm}{r^2}$$

$$g = \frac{(6.67 \times 10^{-11} Nm^2/kg^2)(5.98 \times 10^{24} kg)}{(6.389 \times 10^6 m)^2}$$

$$g = 9.77 m/s^2$$