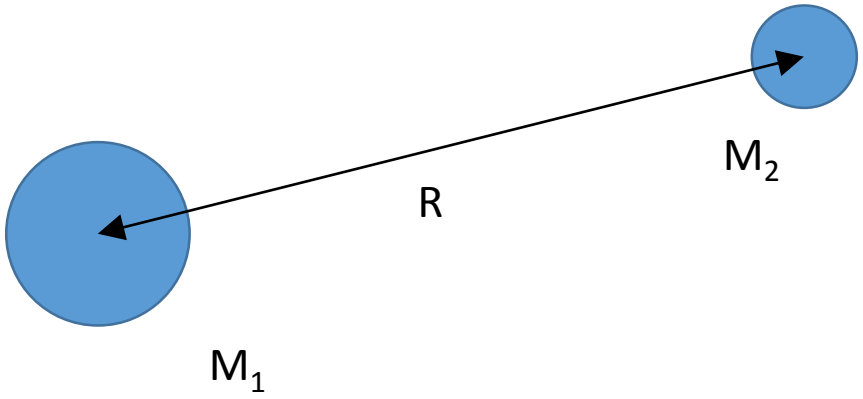
# Gravity

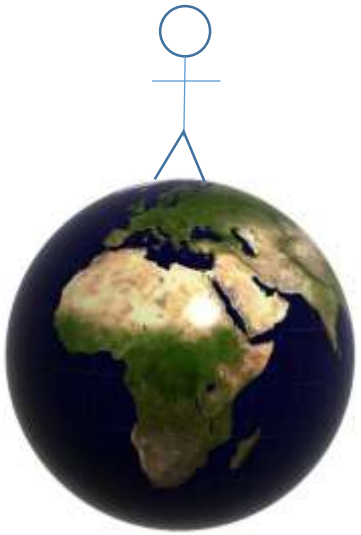
- Objects with mass attract one another (Never repel!)
- Newton's Universal Law of Gravitation




$$F = \frac{GM_1M_2}{R^2}$$

- $G = 6.672 \times 10^{-11}\ Nm^2/kg^2$

# Gravity and Weight



$$F = \frac{GM_{Earth}M_{You}}{R_{Earth}^2}$$

$$F = gM_{You}$$

$$g = \frac{GM_{Earth}}{R_{Earth}^2}$$

# Earth

- Not a perfect sphere
- Equator bulges
- How does this effect g?

- Earth spins
- How does this effect g?

# Earth

- Density not uniform
- Local variations in density & mass
- Local variations in g
- Geologists use this to find minerals etc.

# Gravity is a Long Range Force

- Common misconception that gravity ends once you get up into space (above the atmosphere). False.
- Earth (or Sun) will pull you to back.
- You fall with an acceleration same as $F_g/m$
- You have no apparent weight; same as if you were falling in an elevator shaft.