

GRAVITATION: THE EARTH, SUN, & MOON

1. NEWTON: LAW OF UNIVERSAL GRAVITATION

$$F_G = G \cdot \frac{M_{EARTH} \cdot M_{YOU}}{d^2} \quad F_G = G \cdot \frac{M_{YOU} \cdot M_{EARTH}}{d^2}$$

$$F_G = g \cdot M_{YOU}$$

NEWTON & HALLEY

MASS (INERTIA) v. WEIGHT (FORCE)

WEIGHTLESSNESS v. FREE-FALL

2. DIFFERENTIAL GRAVITATIONAL FORCES

3. EARTH & SUN

a) EARTH ORBIT – PROOF: ABERRATION OF STARLIGHT

– PROOF: PARALLAX

b) EARTH ROTATION – PROOF: FOUCAULT PENDULUM

EARTH'S EQUATOR 23.5° INCLINATION

→ SEASONS

→ PRECESSION VIDEO, PRECESSION DIAGRAM

4. EARTH & MOON

a) MOON'S ORBIT

b) MOON'S PHASES

c) MOON'S ROTATION: SYNCHRONOUS WITH ORBIT

d) EARTH'S TIDES

e) LEAP SECONDS

5. EARTH, MOON, & SUN

a) LUNAR ECLIPSES

b) SOLAR ECLIPSES

c) ECLIPSE "SEASONS"