

#46: GRAVITY

- Attractive force between 2 masses
 - The **LARGER** (size) and **CLOSER** (distance) the STRONGER the Gravity
-

#47: Rotation vs. Revolution

□ Rotation – Earth spinning on axis

■ CAUSES DAY/ NIGHT = 24 HRS

🌀 Revolution – orbit of Earth around Sun

- 365.25 Days

- Earth is tiny bit closer to Sun in Winter!

#48: Terrestrial vs. Jovian Planets

□ Terrestrial

(inner)

- Small
- Rocky
- Dense
- Close to the Sun
- Small/Fast orbit
- Mercury, Venus, Earth, Mars

■ Jovian (outer)

- Large
 - Gaseous
 - Low Density
 - Far from Sun
 - Large / Slow orbit
 - Jupiter, Saturn, Uranus, Neptune
-

49: Shape of Orbits

□ Planetary orbits are slightly oval shaped or **ELLIPSES**

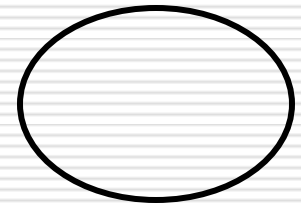
■ This is how we are ***closer to the Sun in Winter***



■ Orbital Velocity is also faster when closer

□ **BUT!** The eccentricity is slight and when drawn to scale looks circular

■ **Always pick the circle on test**



#50: Cause of Seasons

1. 23.5° tilt of Earth's Axis

WINTER-more slanted rays / shorter days= COOLER

SUMMER- longer days / more direct rays= HOTTER

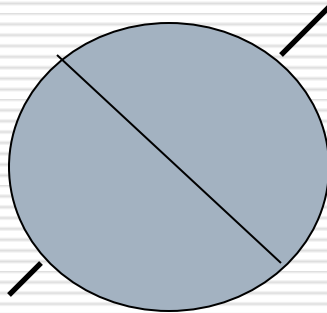
2. Revolution (orbit) of Earth around Sun

#51

Summer:

□ North Pole tilts at the Sun

- SUMMER SOLSTICE / June 21st
- First day of summer / Longest day of the year
- N. Hemisphere has most **DIRECT RAYS**

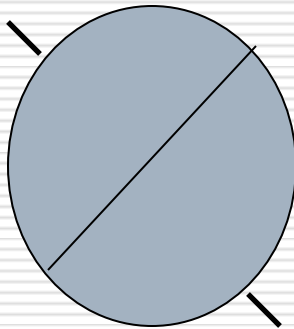


#52

WINTER:

□ North Pole tilts AWAY from SUN

- **Winter SOLSTICE** / Dec. 21st
- First day of winter / Shortest day
- N. Hemisphere gets INDIRECT rays (slanted)



#53

EQUINOX

- Equal DAY / NIGHT, 12hrs / 12hrs
 - Everywhere on EARTH!

 - Axis is sideways / perpendicular to Sun

 - September and March 21st
 - Starts **Spring / Fall**
-

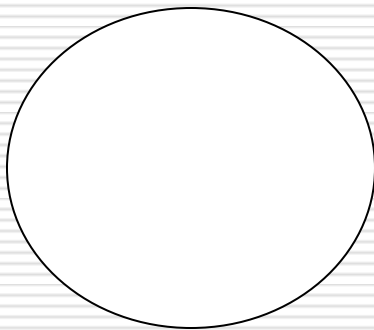
#54 Why do we see phases of the Moon?

- ❑ The Moon is always 1/2 lit by Sunlight
- ❑ As the Moon orbits/ revolves Earth we see different amounts of this half as our angle of view changes
- ❑ The Moon takes a MONTH to revolve
 - It grows into a FULL Moon and shrinks away every 30 days / every orbit

#55 FULL Moon vs. NEW Moon

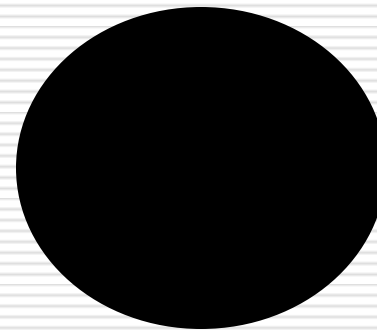
□ FULL

- Opposite SUN
- See Whole Circle



■ NEW

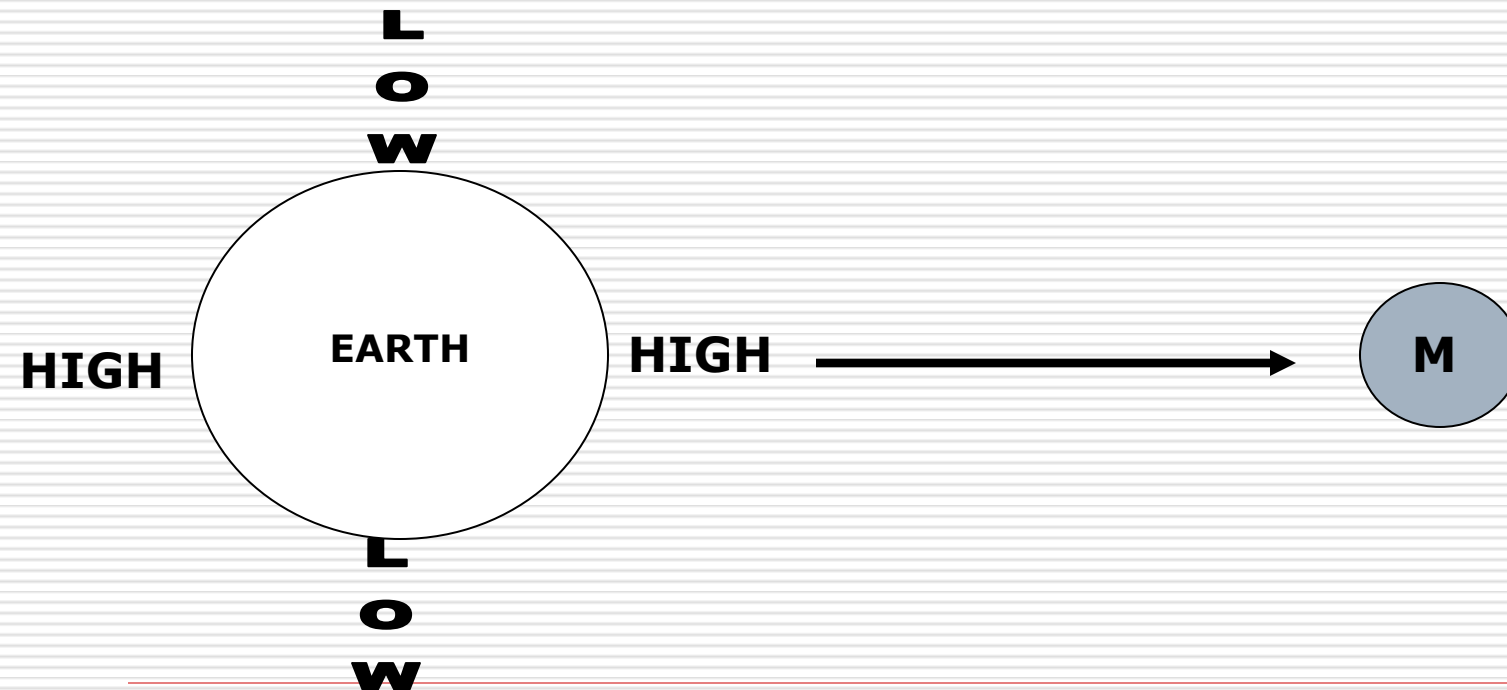
- Between Sun and Earth
- See NOTHING!



#56

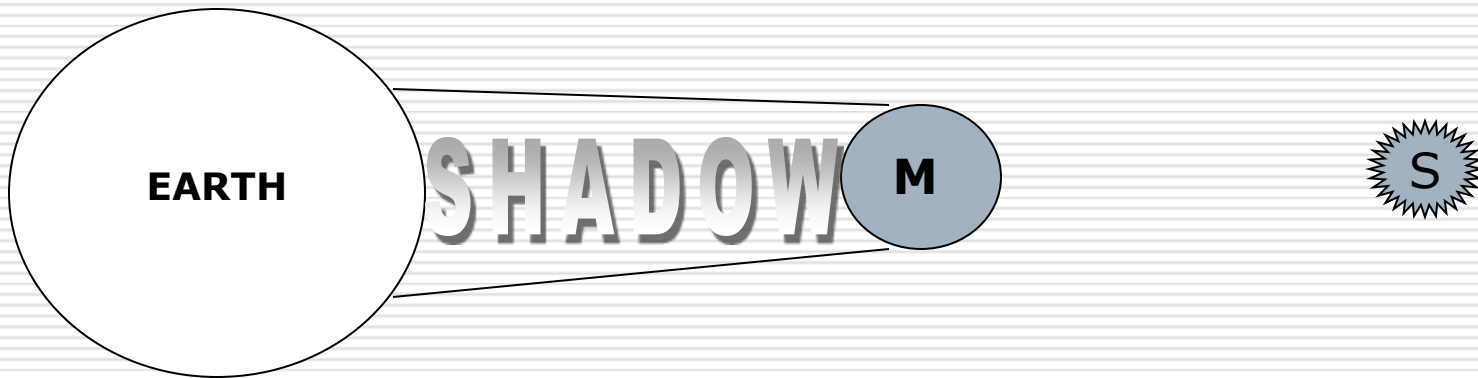
TIDES

- Rise and fall of sea-level from Moon's gravitational pull on the Earth.



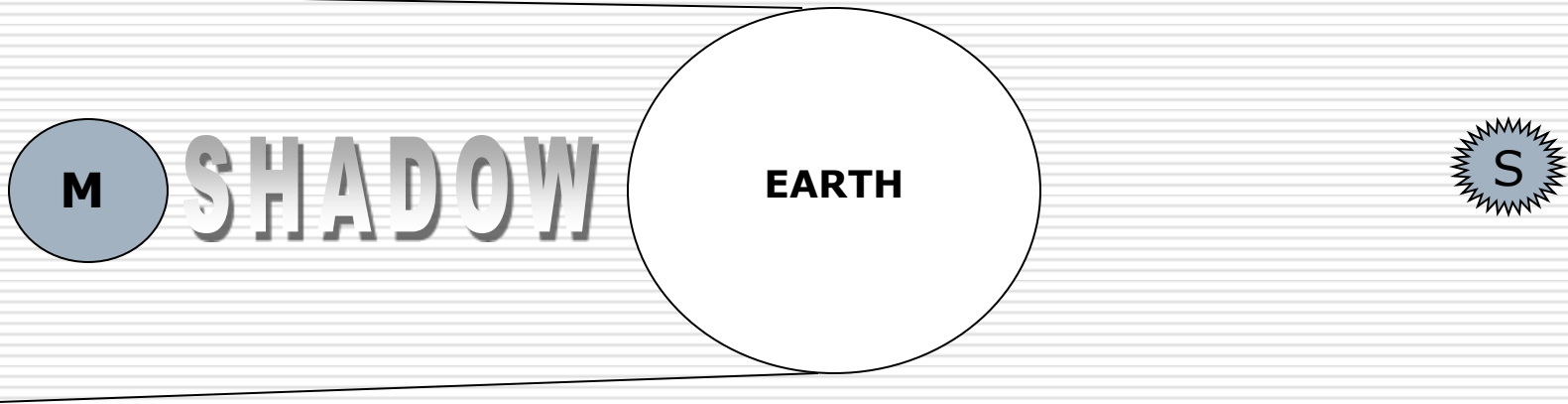
#57 Solar Eclipse

☐ New Moon blocks Sun



#58 Lunar Eclipse

□ Earth blocks Full Moon



#59:

Apparent Size of Moon and Sun

- The Moon and Sun are about the same size in our sky because, although the Sun is millions of times larger, it is millions of times farther away.

