

TmARTSCIENCE YOUTUBE

ASTRONOMY

LUNAR MOTIONS AND CALENDARS

WWW.ADVENTUREEARTHSCIENCE.ORG

Basic definitions...

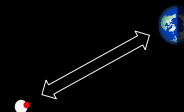
- **Satellite**
 - a body that orbits another body
- **moon**
 - a natural satellite
- **The Moon**
 - the natural satellite of the Earth



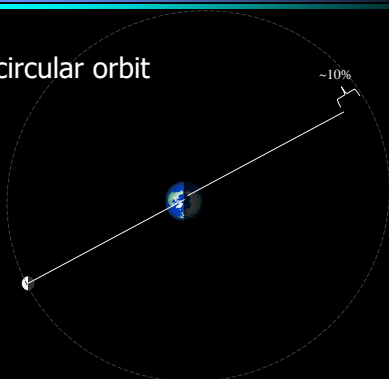
Phases of the Moon



The Moon is tidally locked to Earth



Non-circular orbit



The moon changes in size

Apogee



Minimal moon 12/16/2013
Distance 403,500 km

Perigee



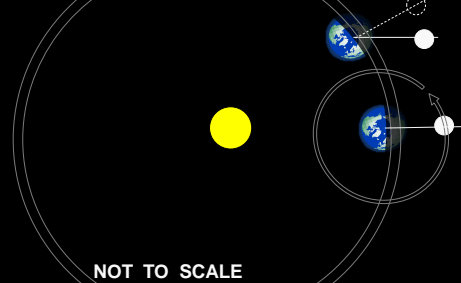
Super moon 06/13/2014
Distance 368,500 km

T. Martin

Moon Orbit

- Lunar orbit 27.3 days
 - Time for Moon to orbit Earth
- Lunar cycle 29.5 days
 - Time between new moons

Earth also orbits Sun



Calendars – astronomical cycles

- Day
 - One rotation of the Earth 23 hours 56 min
 - Diurnal cycle (sun to sun) 24 hours



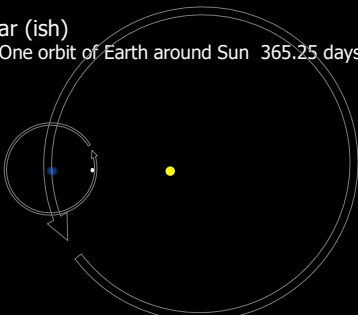
Calendars – astronomical cycles

- Month (ish)
 - One lunar orbit 27.3 days
 - Lunar cycle 29.5 days



Calendars – astronomical cycles

- Year (ish)
 - One orbit of Earth around Sun 365.25 days



Calendars – astronomical cycles

- Day
 - One rotation of the Earth 23 hours 56 min
 - Diurnal cycle (sun to sun) 24 hours
- Month (ish)
 - One lunar orbit 27.3 days
 - Lunar cycle 29.5 days
- Year (ish)
 - One orbit of Earth around Sun 365.25 days
- Not equal divisions

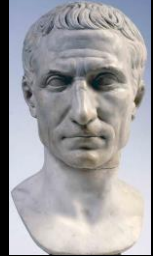
Calendars

- Jewish/Hebrew Calendar
- Lunisolar 2020 = 5781
 - 12 months with extra month added every two or 3 years (7X in 19 years)
 - Looses a day every 231 solar years
- Muslim Calendar 2020 = 1441
- 12 months - lunar cycles
 - Shifts by 11 days each solar year
- Mayan Calendar Jan 1 2020 13.0.7.3.1
 - Cycles that included: Sun, Venus, Earth seasons, human pregnancy, etc...



Julian Calendar est. 46 B.C.E.

- 12 months 31 or 30 days Feb. 29 days
- Introduced leap year
- Year measured to be 365.25 days
 - (11 minutes too long)



Gregorian Calendar (est. 1582)

- Adjusted for drift in the seasons (precession)
- Current calendar (year 365.24 days)
- Leap year every 4 years except for years ending in 00 except for ones divisible by 400.
 - (26 seconds too long)



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