

Lesson 4-5.2 Sky Coordinates

- Sky Coordinates are like coordinates on the earth.
- Longitude and latitude tell you your location on the earth.
- Both are angles, measured with the center of the earth as the vertex.

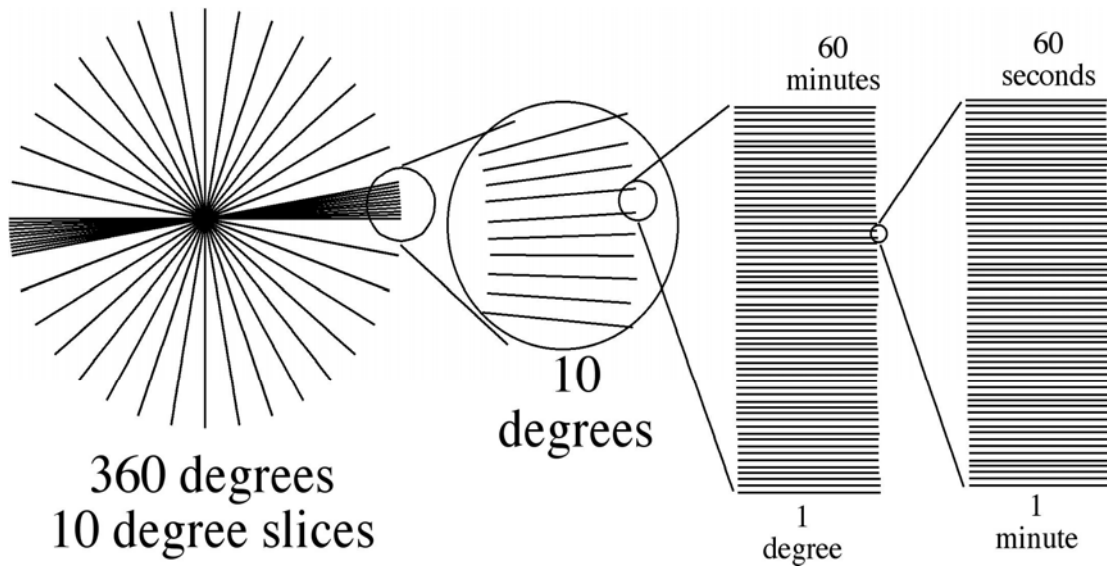


Lesson 4-5.3 Declination

- Sky latitude
- Measured in standard degrees, minutes, and seconds
- Written with these symbols
 - Degrees °
 - Minutes ′
 - Seconds ″
 - Example: $42^{\circ}13'22''$

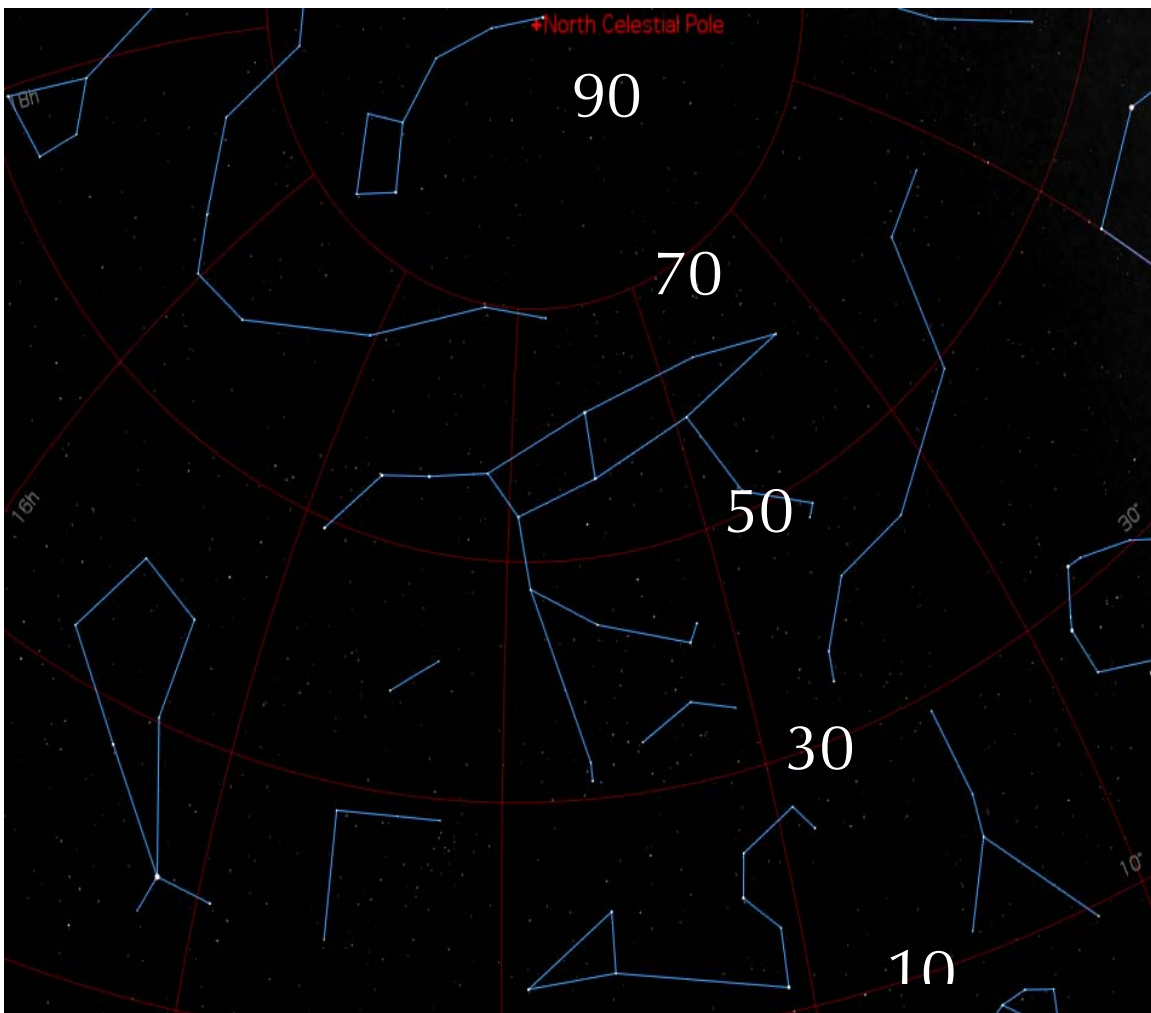
Lesson 4-5.4 Degrees

- 360 degrees in a circle
- 60 minutes in a degree
- 60 seconds in a minute



Lesson 4-5.5 and 4-5.6 Declination

- Zero is aligned with the celestial equator
- Positive values are North
- Negative values are South
- 90 degrees N is the North Celestial Pole (near Polaris)

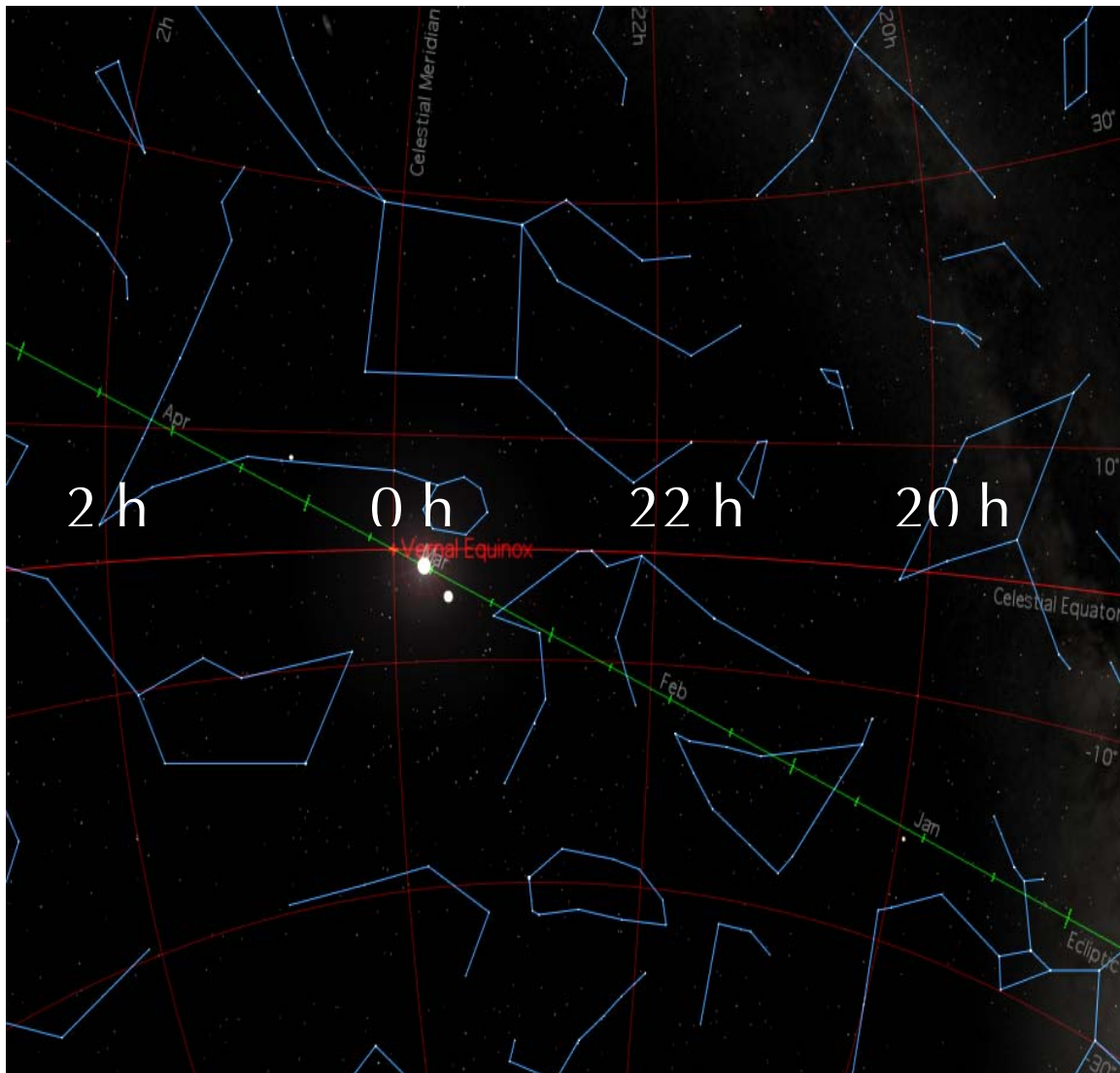


Lesson 4-5.7 Right Ascension

- Sky longitude
- Measures East and West Position
- Needs a zero location
 - First point of Aries
 - Vernal Equinox
 - 0 Right Ascension
 - Analogous to Greenwich = 0 degrees long.

Lesson 4-5.8 and 4-5.9 Vernal Equinox

- Location where the ecliptic crosses the celestial equator, heading north
- Position of the sun on 21 March
- First day of Spring



Lesson 4-5.10a RA coordinates

- Since the sky takes 24 hours to rotate, RA is measured in hours.
- Because everything rises in the east and sets in the west, sky coordinates increase to the left while facing south.
- This is because if you stare in a fixed direction, objects to your left will move into your field of view later, so their RA must be “later.”

Lesson 4-5.10b RA coordinates

- There are 24 hours in a day
- Therefore 24 h of RA in a circle
- RA hours are subdivided into minutes and seconds
- Symbols are different than for degrees
- Example: 22 h 34 min 16 sec

Lesson 4-5.10c RA Coordinates

- RA minutes and seconds are not the same size as ' and " for degrees.
- At the celestial equator, 1 RA minute is 15 times larger than 1 ' of arc.
- RA minutes vary in angular size depending on the declination
- Declination minutes are always the same size

Lesson 4-5.13 Useful tip

- The RA of an object on the meridian (due south) is the sidereal time.
- If an object with an RA of 15 h is on the meridian, the local sidereal time is 15 hours.
- The hour angle of an object is how many hours of RA it is from the meridian.
- $HA = RA \text{ (object)} - LST \text{ (local sidereal time)}$