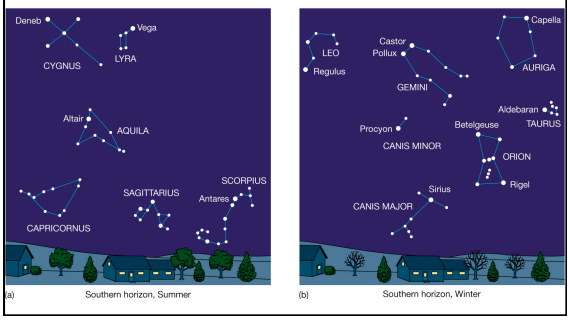
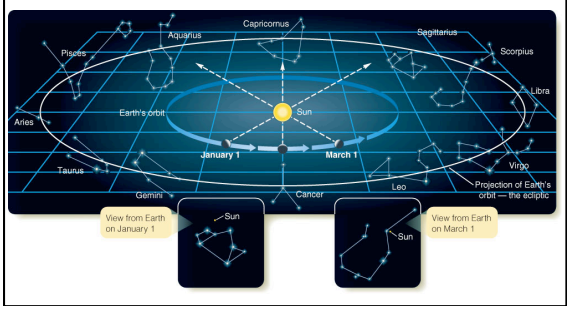
Mastering Astronomy Assignment 3

- Due Feb 17, 11 am
- Read Sections 2.1, 2.2 and S1.2

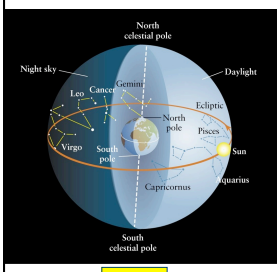
Why don't we see the same constellations throughout the year?



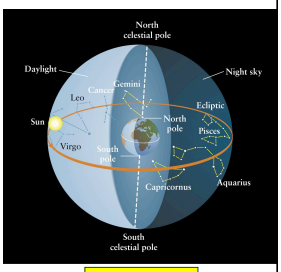
The Earth also revolves around the Sun, which changes our view of the stars



From our perspective...



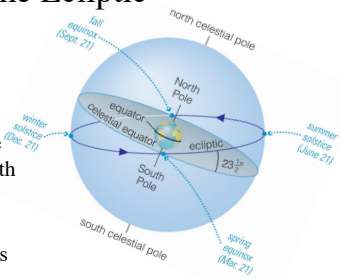
March



September

The Ecliptic

- As the Earth orbits the Sun, the Sun appears to move eastward among the stars following a path called the **ecliptic**
- The ecliptic is a projection of Earth's orbit onto the celestial sphere



The tilt of the Earth's axis causes the ecliptic to be tilted to the celestial equator

Earth circles the Sun in 365.25 days and, consequently, the Sun appears to go once around the ecliptic in the same period. If we could see background stars in the daytime, our Sun would

a) appear to move against them at a rate of 360° per day.

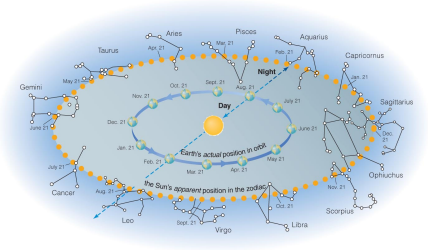
b) appear to move against them at a rate of about 15° per day.

c) appear to move against them at a rate of about 1° per day.

d) remain stationary against these stars.

The sky varies as Earth orbits the Sun

- As the Earth orbits the Sun, the Sun appears to move along the ecliptic.
- At midnight, the stars on our meridian are opposite the Sun in the sky.



Zodiac

The 13 Zodiacal constellations that our Sun covers-up (blocks) in the course of one year (*used to be only 12*)

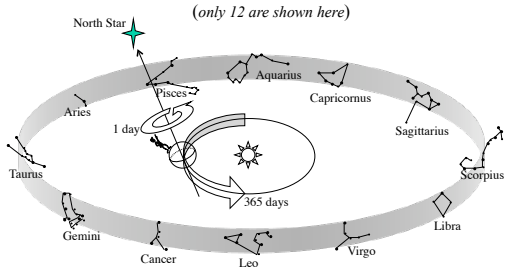
- Aquarius
- Pisces
- Aries
- Taurus
- Gemini
- Cancer
- Leo
- Libra
- Virgo
- Scorpius
- Ophiuchus
- Sagittarius
- Capricornus

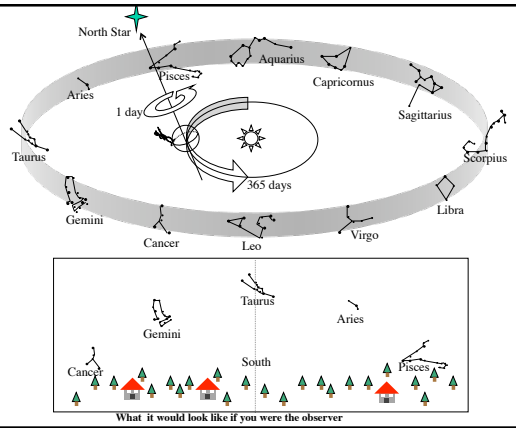
Table 1-1
The 13 Constellations of the Zodiac

Constellation	Dates of Sun's Passage Through
Pisces	March 13–April 20
Aries	April 20–May 13
Taurus	May 13–June 21
Gemini	June 21–July 20
Cancer	July 20–August 11
Leo	August 11–September 18
Virgo	September 18–November 1
Libra	November 1–November 22
Scorpius	November 22–December 1
Ophiuchus	December 1–December 19
Sagittarius	December 19–January 19
Capricorn	January 19–February 18
Aquarius	February 18–March 13

The Zodiacal Constellations that our Sun blocks in the course of one year

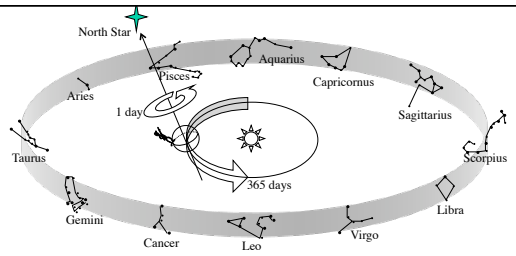
(*only 12 are shown here*)





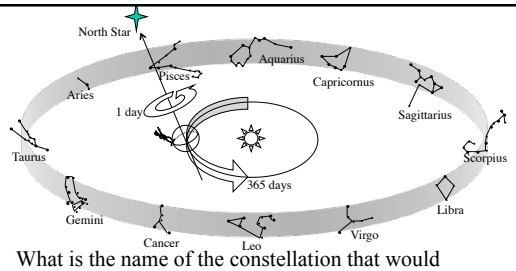
In-class Activities: Seasonal Stars

- Work with a partner!
- Read the instructions and questions carefully.
- Discuss the concepts and your answers with one another. Take time to understand it now!!!!
- Come to a consensus answer you both agree on.
- If you get stuck or are not sure of your answer, ask another group.
- If you get really stuck or don't understand what the question is asking, ask me.



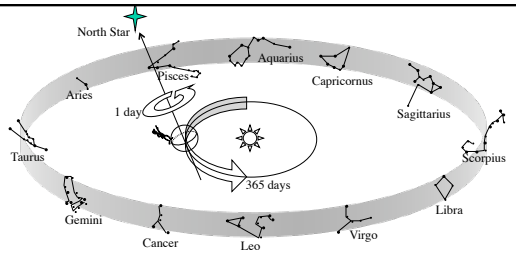
What time is it for the observer?

a) noon
b) 6am
c) Midnight
d) 6pm



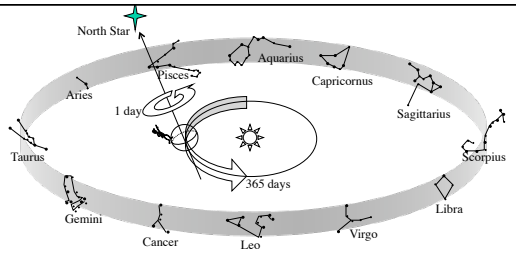
What is the name of the constellation that would appear on the observers Eastern Horizon?

a) Cancer
b) Gemini
c) Taurus
d) Aries
e) Pisces



Two months from the time shown what constellation will be high in the Southern sky, at Midnight?

a) Taurus
b) Cancer
c) Pisces
d) Virgo

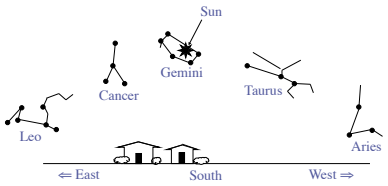


Two months from the time shown, which constellation would the Sun be?

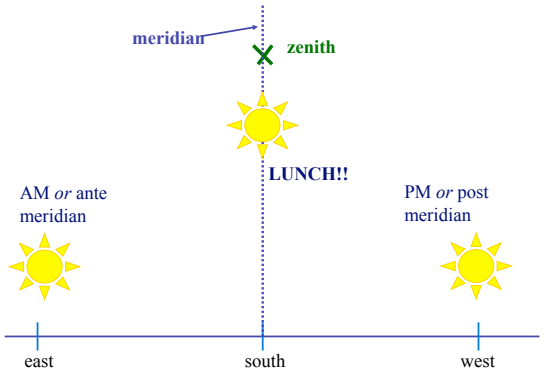
a) Scorpius
b) Pisces
c) Capricornus
d) Virgo

If you could see stars during the day, the drawing below shows what the sky would look like at noon on a given day. The Sun is near the stars of the constellation Gemini. Near which constellation would you have expect the Sun to be located at *sunrise* on this day?

1. Leo
2. Cancer
3. Gemini
4. Taurus
5. Aries



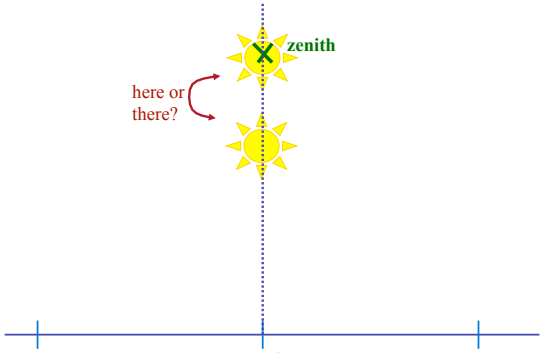
How can we describe the motion of the sun in the sky?



Noon

- Noon is the precise moment when the Sun is highest in the sky (on the meridian) and the sundial casts its shortest shadow.
- Sun highest in the sky ≠ clocks read 12 pm

Where is the Sun at noon today?



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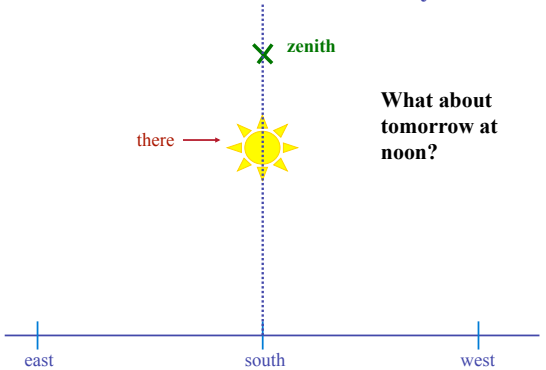
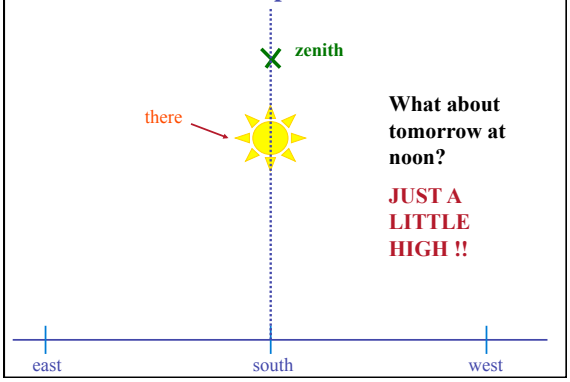
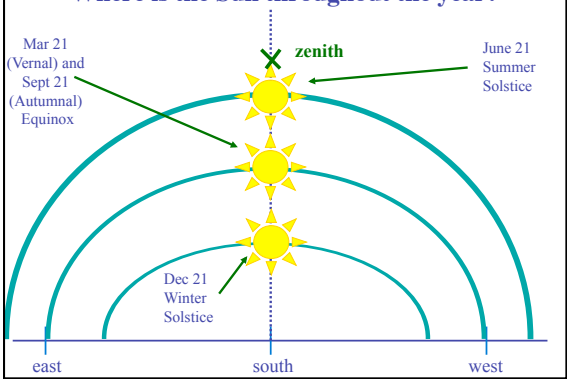


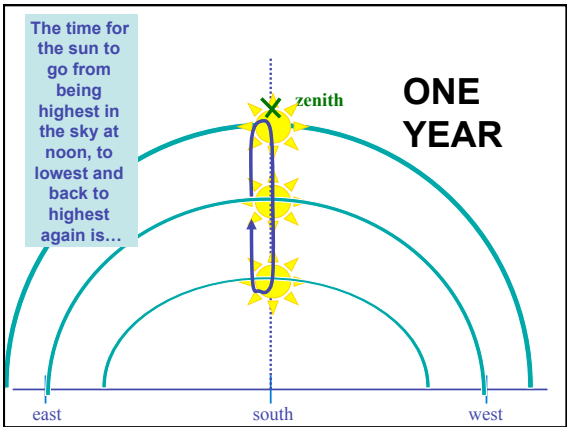
What about the path of the Sun?



Where is the Sun throughout the year?

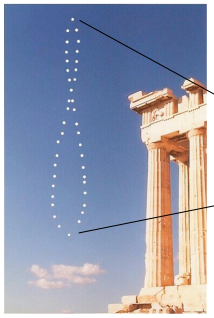


The time for the sun to go from being highest in the sky at noon, to lowest and back to highest again is…



Position of the Sun when photographed during the day of the winter and summer solstice

Sun's altitude changes with seasons



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