

I can describe the difference between apparent and real motion

I can say how quickly the Earth rotates & in what direction.

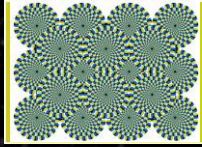
I can name the star that the North Pole always points to.

I can state what is special about Polaris.

I can draw the sun's path for the different seasons.

I can explain how the sun's height effects the shadow.

• Apparent Motion  
- When objects appear to be moving



• Real Motion  
- when objects are really moving



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• Earth rotates 15 °/hr from West to East  
- Causes the sun & stars to appear to rise in the East & set in the West

**Stars don't actually move!**



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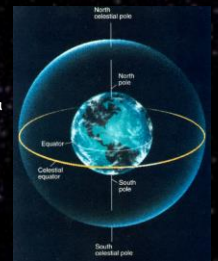
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• Night sky is referred to as a celestial sphere

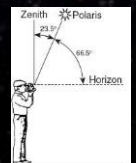
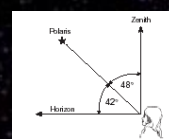


The North Celestial Pole always points to Polaris!

• That is why the stars near Polaris appear to move around it in a complete circle



**\*\*The altitude of Polaris = your latitude in the Northern Hemisphere.\*\***



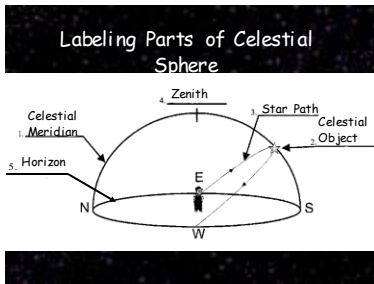
*Animation*

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Stars appear to rise in the east & set in the west just like our sun moving 15 °/hr

[Motion of the Sun Simulator](#)  
[Game](#)

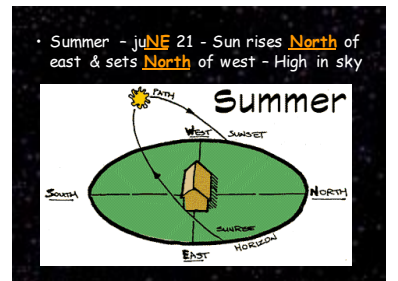
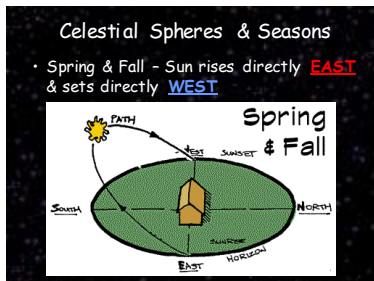
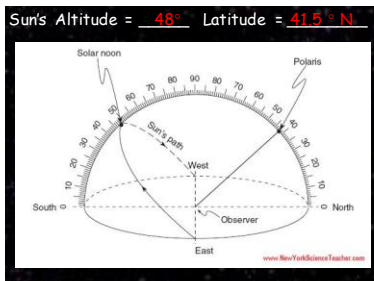
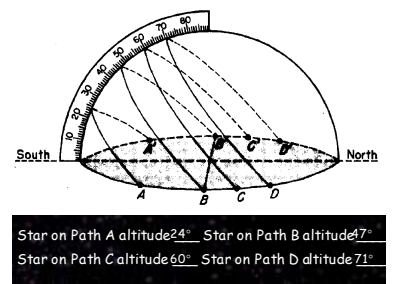
- Parts of the Celestial Sphere
- Zenith**  
- Point on the sphere that is directly overhead
  - Horizon**  
- Everything ↑ is visible, everything ↓ is not
  - Celestial Meridian**  
- Imaginary circle passing through the N and S points on our horizon and the zenith
  - Celestial Object**  
- An object located on the celestial sphere
  - Star Path**  
- Apparent movement of star on the celestial sphere



Altitude and Azimuth

**Altitude**  
 - The height above the horizon  
 - The highest altitude is 90

**Azimuth Direction**  
 - Direction the star is located at



• Winter - de**SE**ember 21 - Sun rises **South** of east & sets **South** of west - Low in sky

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[http://earthscience.hook12.org/wadprocuserresources/units/units6\\_21.htm](http://earthscience.hook12.org/wadprocuserresources/units/units6_21.htm)  
<http://www.ck12.org/earth-science/Earth-tilt-and-seasons/>

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### Sun and Shadows

- The higher the sun is in the sky the shorter the shadow

Length of the Shadow vs Height of the Sun  
 Length of the Shadow vs Time of Day (Sunrise to Sunset)

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