

Latitude and Local Noon Sun Angle

Name:

Date:

Use the Sun-Earth Connection software at sciencepickle.com to answer the following.

Complete the following table using data from the 'Earth View' tab.

	<i>Local Noon Sun Angle</i>			
Latitude	March 21 Equinox	June 21 Solstice	September 22 Equinox	December 21 Solstice
90°N				
75°N				
66.5°N				
45°N				
30°N				
23.5°N				
15°N				
0°				

For each latitude, circle the highest local noon sun angle. Describe any observed trend(s). Use the graphs on 'Yearly Trends' to check your answer.

What latitudes will have the sun directly overhead at some time during the year? Use the graphs on 'Yearly Trends' to check your answer.

What latitudes will have at least 24 hours of darkness at some time during the year? Use the graphs on 'Yearly Trends' to check your answer.

Add the latitude and the local noon sun angle on the March 21 equinox and discuss the observed trend(s).

Latitude	Local Noon Sun Angle March 21	Latitude + Mar 21 Angle
90°N		
75°N		
66.5°N		
45°N		
30°N		
23.5°N		
15°N		
0°		

Calculate the difference between the local noon sun angle for the June 21 solstice and the March 21 equinox and at different latitudes and discuss the observed trend(s).

Latitude	Local Noon Sun Angle June 21	Local Noon Sun Angle March 21	Difference
90°N			
75°N			
66.5°N			
45°N			
30°N			
23.5°N			
15°N			
0°			

Calculate the difference between the local noon sun angle for the December 21 solstice and the September 22 equinox discuss the observed trend(s).

Latitude	Local Noon Sun Angle December 22	Local Noon Sun Angle September 22	Difference
90°N			
75°N			
66.5°N			
45°N			
30°N			
23.5°N			
15°N			
0°			

The lower the Sun is in the sky, the less intense heating of the ground. The most intense heating occurs when the Sun is directly overhead, and no heating occurs when the Sun is in the horizon. Based on the data above, which latitudes experience the greatest seasonal temperature change? And which the least?

How does Earth's obliquity factor into the temperature of the seasons at different latitudes? Support your conclusions. Would your conclusions change for the Southern Hemisphere?