

TIME AND SEASONS:

INTRODUCTION:

Cleve: April 20 3:00 pm Spring
Sydney: April 21 6:00 am Fall

TIME / DAYLIGHT:

- The Earth rotates on an axis 23.5 degrees from the vertical. (Fig 1)
- As it rotates, ½ of the Earth is daylight, the other ½ is night time.
- Each "day" begins at the International Date Line (180° longitude) located longitudinally over the Pacific Ocean. Crossing over this line results in a time zone change of 24 hours.
- 1 rotation lasts 24 hours (1 day).
- The Prime Meridian (0° longitude) runs through Greenwich, England and is used as a frame of reference for time (Greenwich Mean Time - GMT)

SEASONS

As the Earth rotates, it revolves around the Sun.

- 1 revolution takes 365.25 days.
- Seasons are different at different positions during this revolution.

1) LENGTH OF SURFACE HEATING TIME (DAYLIGHT)

- Because the EARTH IS TILTED the amount of daylight changes throughout the year.
- The longer the daylight, the more solar radiation is absorbed by the surface.
 - o DEC: N. Hem: short time daylight
S Hem: long time daylight
 - o JUN: N. Hem: long time daylight
S Hem: short time daylight

2) SOLAR RAY INTENSITY (angle of solar ray contact with surface)

- The region of the Earth that receives direct (90 degree) rays have the hottest temperatures at that time.
- Those regions change throughout the year, because THE EARTH IS TILTED
 - o DEC: S Hem has direct rays
N Hem has diffuse rays
 - o JUN: N. Hem has direct rays
S. Hem has diffuse rays

June 21: Solstice

Sept 22: Equinox (12 hrs day / night)

March 20: Equinox (12 hrs day / night)

Dec. 21: Solstice

- If the Earth were NOT tilted
 - o the surfaces at each latitude would be heated the same (same day length of 12 hrs; and same solar ray intensity depending on latitude)
 - there would be no seasons.
 - Equator would have the most intense rays (most direct ray contact)
 - The poles would have the least intense rays (least direct ray contact)

If the Earth were tilted GREATER than 23.5 degrees:

- More extreme seasons-
 - o Hotter Summers
 - Longer daylight
 - More intense rays
 - o Colder Winters
 - Shorter daylight
 - Less intense (more diffuse) rays

