

The earth precesses (wobbles) about its axis once every 26,000 years.

#### solar day

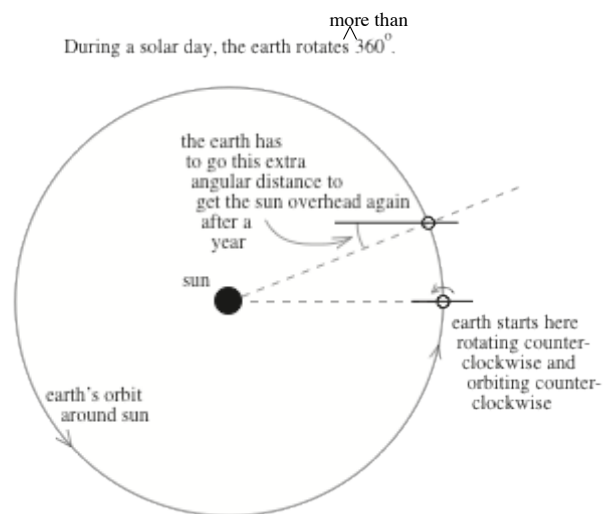
- time it takes from noon of one day to noon of the next day
- it is determined by the rotation of the earth about its axis AND by its orbital speed around the sun
- by definition, there are 24 hours in a solar day
- the earth has to rotate more than 360 degrees to do this
- the additional rotation is 1 degree

5.)

#### sidereal day

- time it takes star to pass the same point in the sky as it appears to travel across the sky (easiest to identify when star first rises)
- it is determined solely by the rotation of the earth about its axis
- a solar day is approximately 4 minutes longer than a sidereal day
- there is exactly one more sidereal day per year than solar day

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6.)

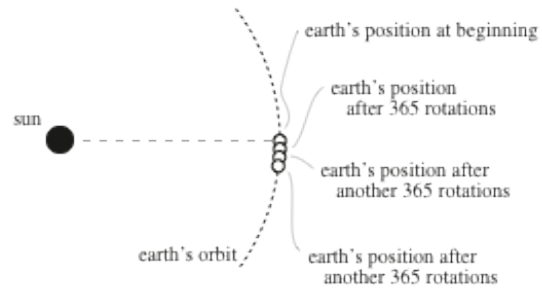
#### the year

- time it takes the earth to go around the sun once
- earth doesn't make a whole number of rotations in one year—it makes approximately 365.25 rotations
  - one year takes 365.25 solar days
  - one year takes 366.25 sidereal days
- if we want to position of the earth, relative to the sun, to be the same on a given day in each and every "year," we need to deal with that extra .25 rotations
  - otherwise, we will get season creep (I made this term up--pretty cool, huh?)

8.)

--why is season creep important? It's important to farmers because they want to know that in April, it will be time to plant their crops

Notice how earth's position, relative to the sun, migrates with each successive set of 365 rotations.



9.)

--the US and England didn't accept the Gregorian calendar until 1752

--by that time, 12 days had been lost. At the change-over, Wednesday, Sept. 2, 1752 was followed by Thursday, Sept. 14, 1752.

--interesting side point: it wasn't until after the Gregorian calendar was adopted that New Years fell on January 1 (before that it was on March 25).

--the Russians didn't accept the new calendar until 1918

--the Japanese didn't transfer until 1873

--the Chinese didn't transfer until 1949

11.)

--with the creep, in 760 years Christmas will fall in the middle of summer

--enter Julius Caesar. In 46 BC, he cut 90 days out of the calendar of the time and instituted "leap year."

--unfortunately, by 1582, the Julian calendar was 10 days off.

--The problem? The extra bit of rotation was really closer to .24 solar days worth, not .25.

--enter Pope Gregory. In 1582, he created the Gregorian calendar. It also had leap year, except every hundred years leap year was skipped . . . except every 400 years when it was kept.

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