

# *Earth, Moon, and Sun*



## Section 1: Earth in Space

# *Guide For Reading*



- What causes day and night?
- What causes the cycle of seasons on Earth?

*Days and Years*

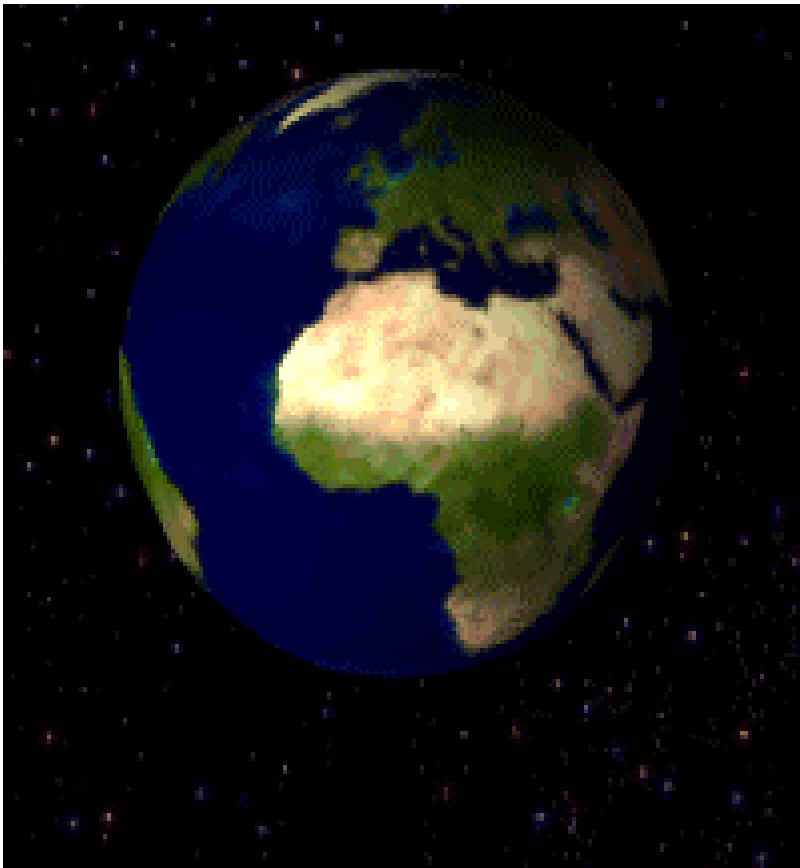


# *Astronomy*



- The study of the moon, stars and other objects in space

# Axis & Rotation



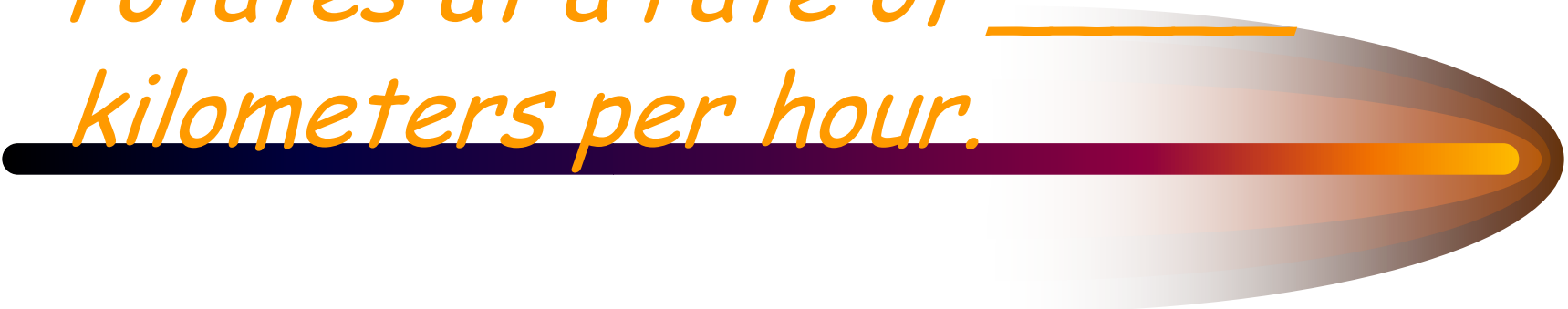
- Axis: The imaginary line that passes through Earth's center and the North and South poles
- Rotation: Earth spinning on its axis

*The north pole points toward  
the North Star, also known as*

          .

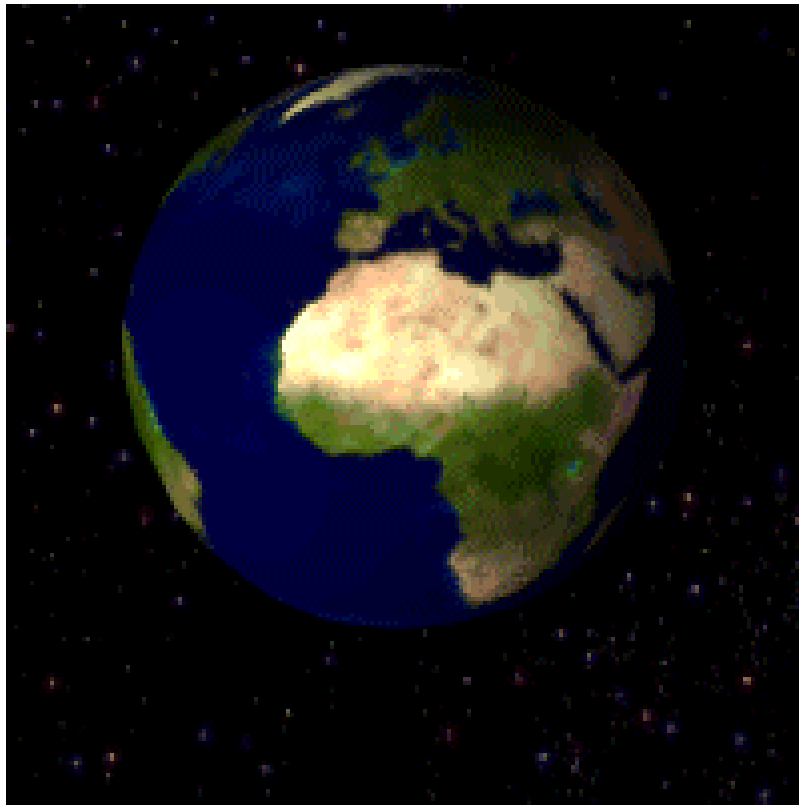
- Polaris

*On the equator, the earth  
rotates at a rate of \_\_\_\_\_  
kilometers per hour.*




- 1,600 kilometers per hour

*As Earth rotates \_\_\_\_\_, the sun appears to move \_\_\_\_\_ across the sky.*



- Eastward
- Westward

# *Checkpoint: Why do the sun and moon seem to move each day?*



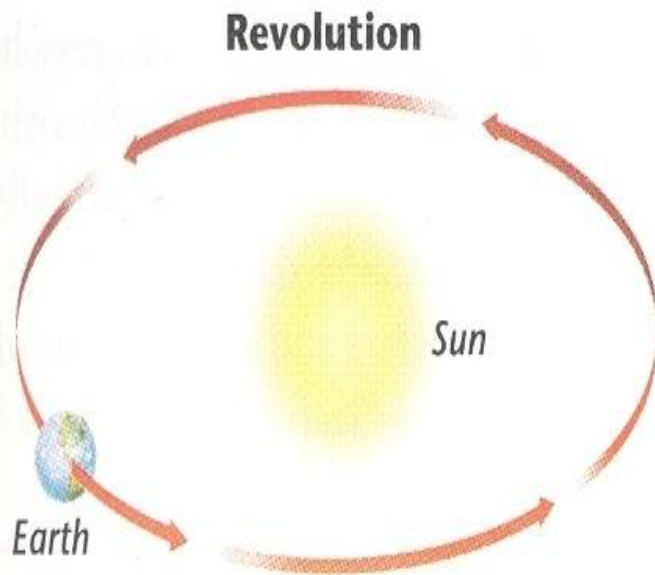
- The sun and moon seem to move each day mainly because Earth is rotating on its axis

# *What causes day & night?*



- The Earth completes one rotation on its axis during a 24 hour period
- As Earth rotates eastward, a location moves through sunrise (shadow), day (sunlight), sunset (shadow), and night (darkness)

# Revolution



- Revolution: The movement of one object around another object

*One complete revolution around the sun is called a \_\_\_\_\_.*

- Year

# *Orbit*



- Orbit: Earth's path as it revolves around the sun

*Earth's \_\_\_\_\_ as it travels around the sun  
is not quite a circle, but rather a slightly*

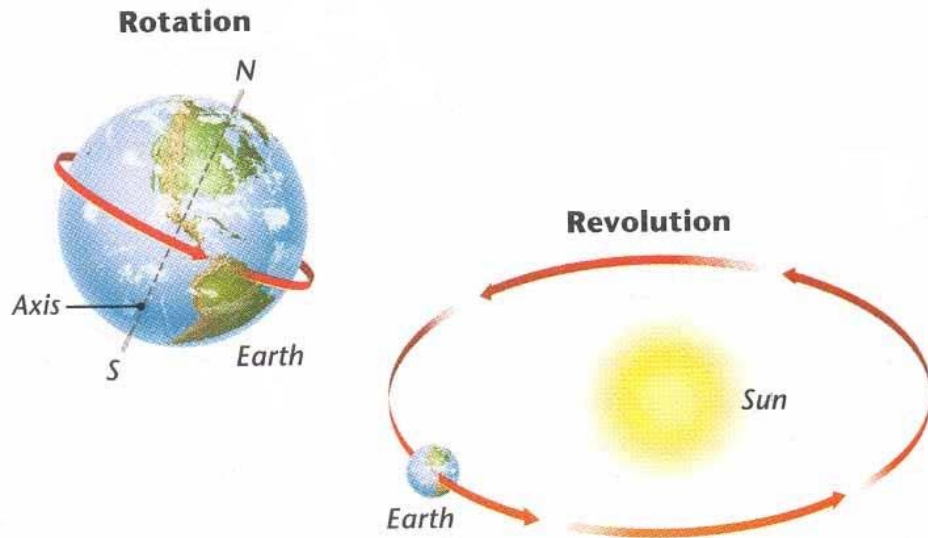
*\_\_\_\_\_ or \_\_\_\_\_.*



- orbit
- flattened circle
- oval shape

# Figure 1: *Applying Concepts*

*What is one full rotation called? What is one complete revolution called?*



- One full rotation is called a day
- One complete revolution is called a year

*Sharpen Your Skills: Earth moves at a speed of about 30 km/sec as it travels around the sun. What distance, in kilometers does Earth travel in a minute? An hour? A year?*

<b>1 minute (60 sec.)</b>	<b>1 hour (60 min.)</b>	<b>1 Day (24 hours)</b>	<b>1 Year (365 days)</b>

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# *Why does Earth have a "leap year" every fourth year.*



- Earth's orbit around the sun is  $365 \frac{1}{4}$  days
- After 4 years, our calendar is about 1 day ahead of Earth's orbit
- To line up our calendar with Earth, an extra day is added (February 29<sup>th</sup>)
- $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 1$  day

# *Seasons on Earth*



# Figure 2: Interpreting Diagrams: Why is it colder near the poles?



- It is colder near the poles because the sunlight hits Earth at an angle and the sun's rays are spread out over a larger area

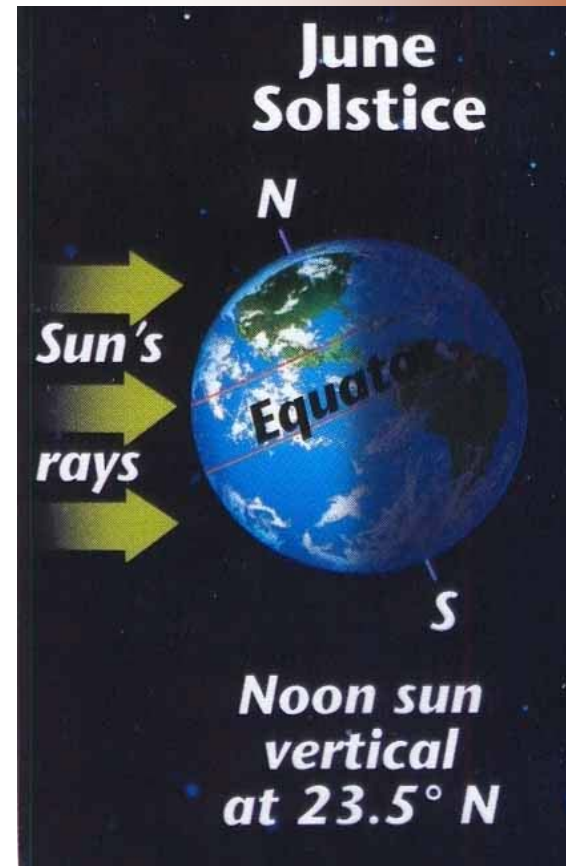
# *Latitude*



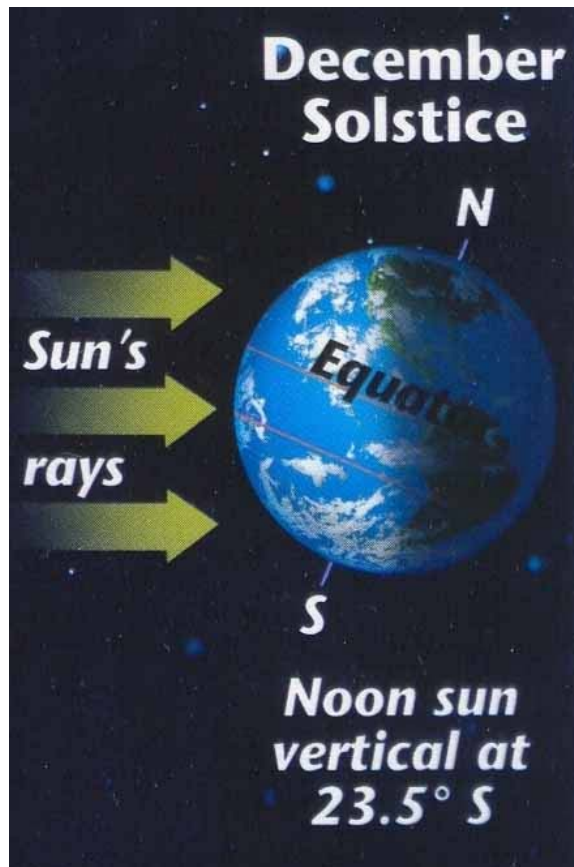
- A measurement of distance from the equator
- Expressed in degrees north and south

# *Why do we have such warm temperatures in the northern hemisphere during the season of summer?*

- The Northern hemisphere is tilted toward the sun
- Therefore, the Northern Hemisphere gets a larger amount of direct sunlight causing longer days and warmer temperatures

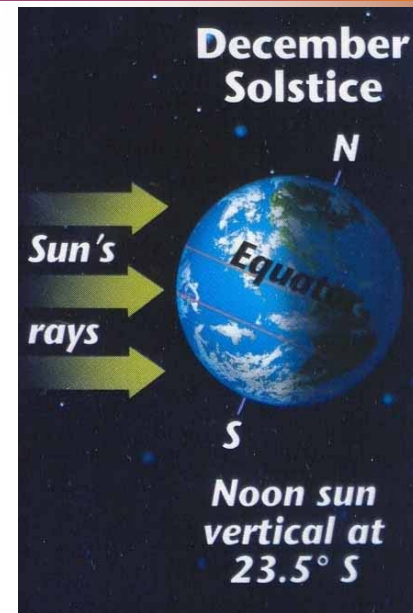
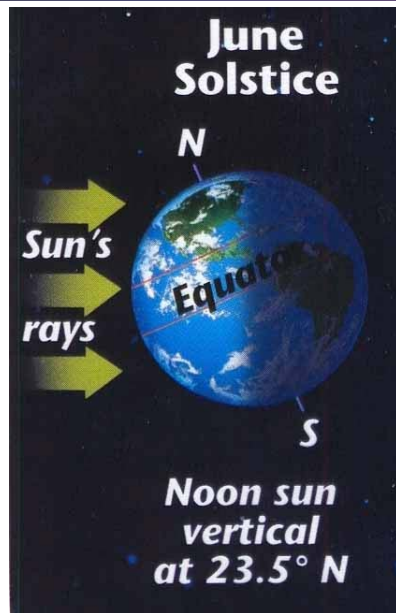


# Why do we have fewer hours of daylight during the winter in the northern hemisphere?



- The Northern hemisphere is tilted away from the sun
- Therefore, the Northern Hemisphere gets a smaller amount of direct sunlight causing shorter days and cooler temperatures

# Solstice



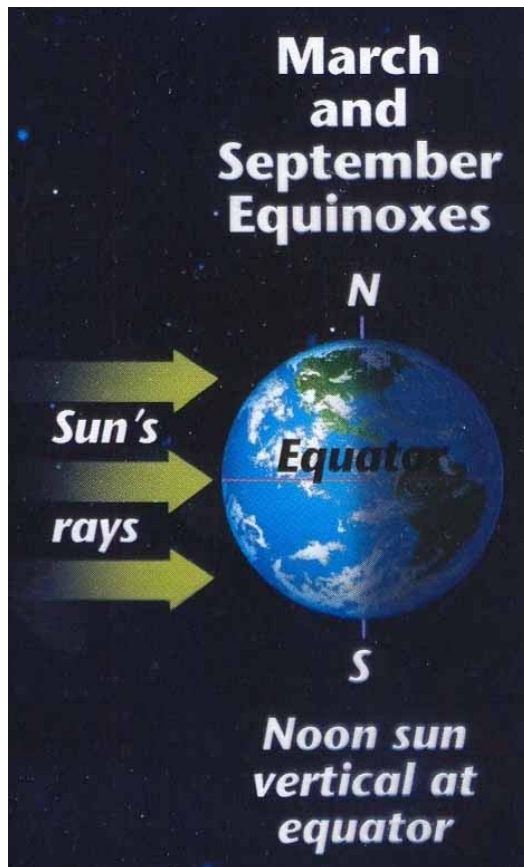
- Two days each year when the noon sun is overhead at either  $23.5^{\circ}$  south or  $23.5^{\circ}$  north

# *When do the summer and winter solstices occur?*



- Summer - Around June 21
- Winter - Around December 21

# Equinox



- The two days of the year on which neither hemisphere is tilted toward or away from the sun
- Means "equal night" because day and night are almost equal

# *Vernal Equinox*




- The day of the year that marks the beginning of spring in the Northern Hemisphere

# *Autumnal Equinox*

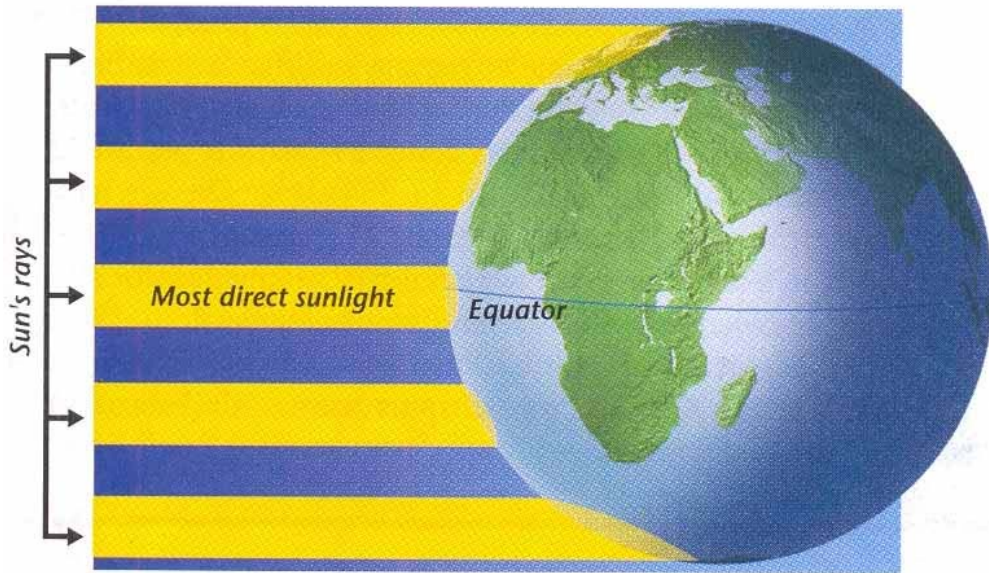
- The day of the year that marks the beginning of fall in the Northern Hemisphere

*When do the two equinoxes occur? What is the proper name for them?*



- Spring - Vernal equinox. This occurs around March 21
- Fall - Autumnal equinox. Around September 23.

# *Why are the days and nights during the seasons spring and fall more even or equal in length?*



- The direct sunlight is more evenly distributed over the northern and southern hemispheres
- The most direct sunlight during these seasons is on the equator

# *Guide For Reading: What causes the cycle of the seasons on Earth?*



- Earth has seasons because its axis is tilted as it moves around the sun
- Depending on how much direct sunlight that our location receives at a particular time causes seasons

