

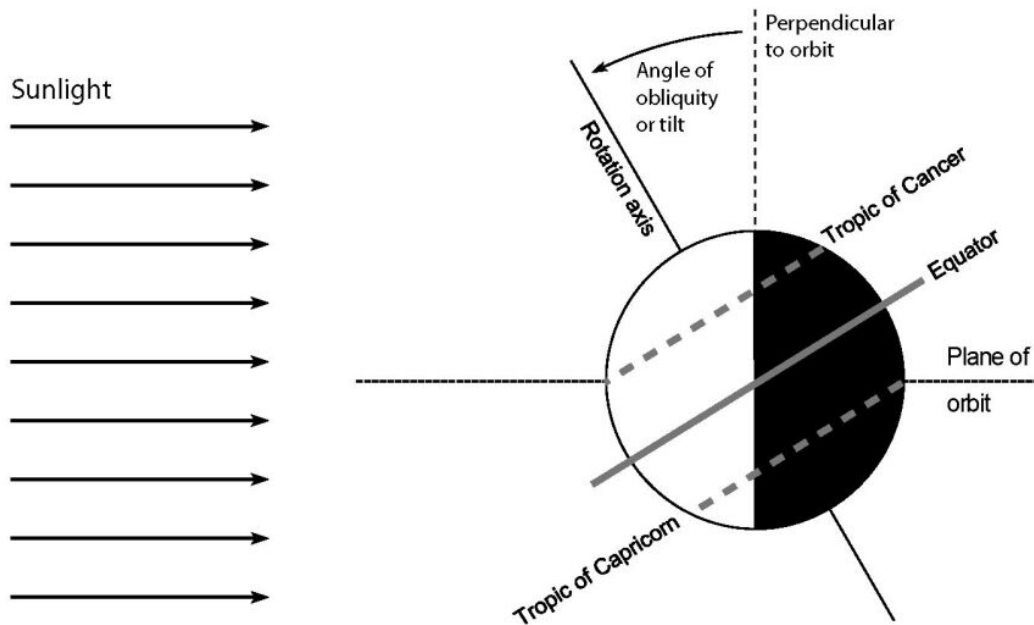
Sunlight and the Seasons

A **season** is a subdivision of the year, marked by changes in weather, and hours of daylight.

In temperate and subpolar regions, there are generally four recognizable seasons: spring, summer, autumn, and winter. In some tropical regions, it is more common to refer to only two seasons: rainy, and dry. This is because the amount of rainfall varies more dramatically than the average temperature.

Cause and Effect

The seasons result from the Earth's axis being tilted 23.5 degrees, relative to its orbital plane. At any given time, this tilt results in one part of the planet being tilted towards the Sun, while the other part is tilted away. In the diagram below, for example, the northern hemisphere is tilted towards the Sun, while the southern hemisphere is tilted away from the Sun.

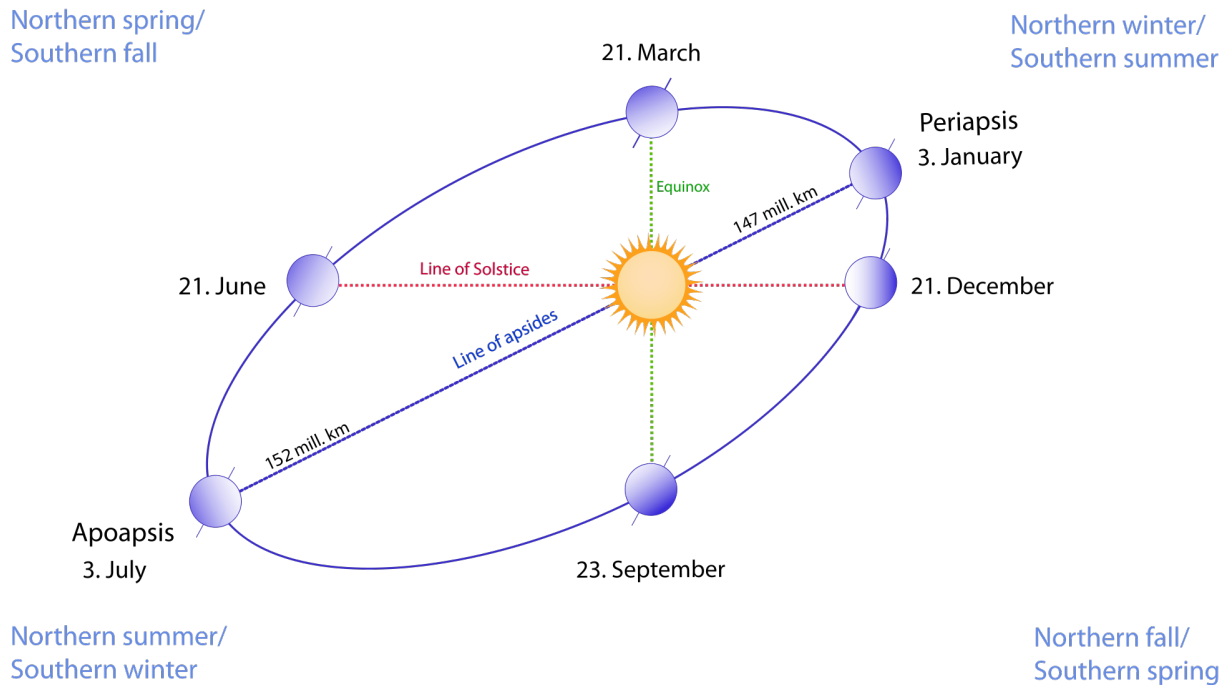


The part of the planet that is tilted toward the Sun will be struck by more direct sunlight. This will result in the warmer temperatures that we associate with the summer months.

At the same time, the part of the planet that is tilted away from the Sun will be struck by less direct sunlight. This will result in the cooler temperatures that we associate with the winter months.

Thus, at any given time, the two hemispheres will be experiencing opposite seasons (summer in the north = winter in the south, and vice versa).

A commonly held misconception is that the seasons are a result of Earth's distance from the Sun (i.e. farther from Sun = winter, closer to Sun = summer). Interestingly, this turns out to be completely wrong, as the following diagram shows.



As you can see in the diagram, the Earth is actually closest to the Sun in January and farthest from the Sun in July.

Length of the Day

Approximately half of the Earth is illuminated at any given time by sunlight. Areas of the planet that are illuminated are said to be experiencing “daytime.” Although the length of the daytime period is always 12 hours at the equator, at all other latitudes the length varies with the season. This is also a result of Earth's tilted axis.

Areas experiencing summer are tilted toward the Sun. Their tilt toward the Sun leads to more than half of each 24 hour period being spent in daytime. The exact amount of daylight experienced will depend on how far away from the equator a place is. In general, the farther away from the equator a place is, the longer its days will be in summer. In Winnipeg, for example, the longest day of the summer has over 16 hours of daylight.

Areas experiencing winter are tilted away from the Sun. This tilt leads to less than half of each 24 hour period being spent in daytime. Again, the exact length of the day will vary with latitude. In general, the farther away from the equator a place is, the shorter its days will be in winter.

Worksheet

For a video explanation of the seasons, visit the following website:

http://www.teachertube.com/viewVideo.php?title=What_Causes_Seasons_on_Earth&video_id=657

1. Briefly explain why there are seasons on Earth.

2. During summer in Winnipeg, which way is Earth's axis tilted: towards the Sun, or away from the Sun?

3. In January, what is the season in

a) Winnipeg? _____

b) Australia? _____

4. During what month are we farthest from the Sun? During what month are we closest to the Sun?

5. Is it true that we are farther away from the Sun during winter than we are during summer?
