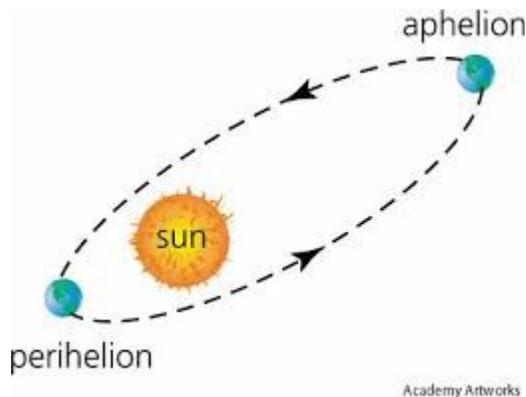


There is a number of popular **misconceptions** concerning notions that are counted among basic astronomical knowledge. Surprisingly, according to some disturbing recent surveys, in some nations, it is not that uncommon to come across the belief that **(a)** the Sun is, in fact, orbiting the Earth, and not vice versa.

Another misconception has to do with the cause of the yearly change of the seasons on the Earth. Most people, when asked, will answer that **(b)** it is due to the variation of the distance of our planet from the Sun.

While the distance from the Sun does indeed play a minor part, in fact, the Earth reaches the closest point to the Sun during its orbit, known as **perihelion**, during winter (!!), and the point furthest, or **aphelion**, during summer (!).



Moreover, that statement holds true only for the **northern hemisphere**. After all, Santa Claus is known to appear wearing only his swimming trunks in that remote continent of Australia. If that were really the answer, why should it only apply to the northern hemisphere in the first place? There must be a different answer, a more reasonable one.

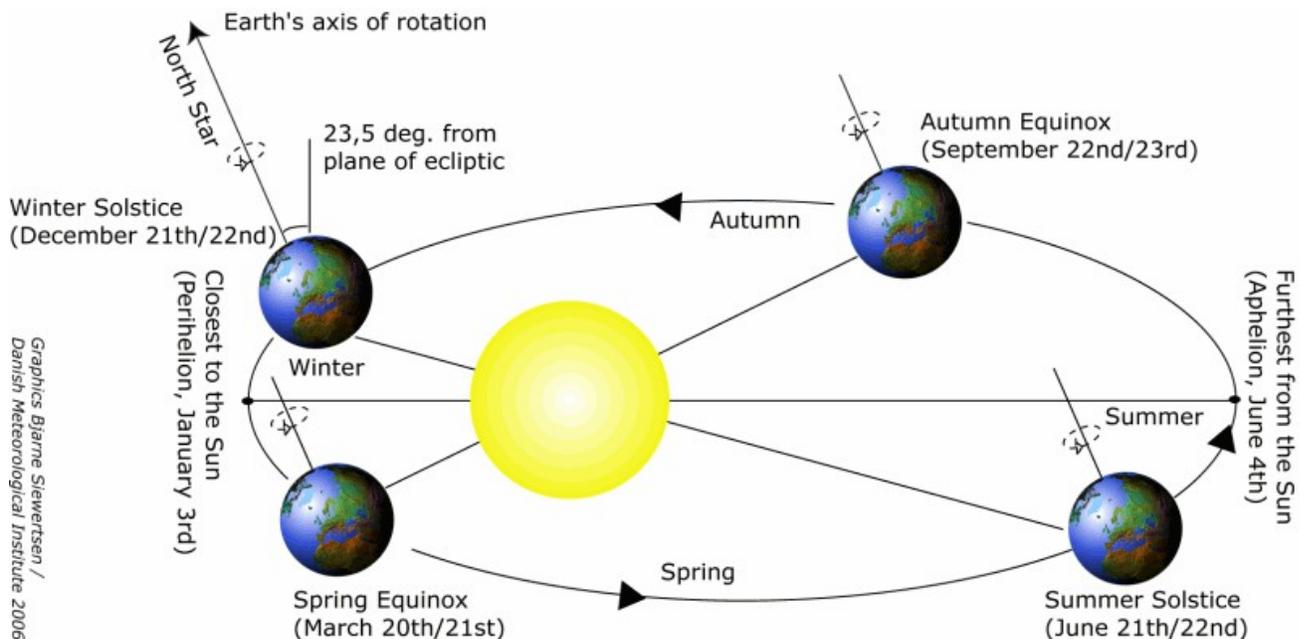
The correct answer, also serves as an answer to other questions like:

- “why does the daytime last longer during the summer than winter?” or
- “why do they say that shadows grow during the winter?” or even
- “why does a day last for 6 months at the polar caps, followed by an equal night?”

The **culprit** is the **inclination** of the Earth's **axis of rotation**. It is **tilted** by roughly **23.5 degrees**, and that is the **prime cause** of all of the above phenomena. To get the general idea, one should first imagine the Earth **orbiting a fixed Sun**. However, the Earth's axis should not be **vertical** to the **orbital plane**, called the **ecliptic**, but somewhat tilted. Moreover, the axis itself does not rotate along with the Earth, and, in fact, points more or less to the same remote star in space.

The above facts, when combined, lead to the conclusion that **the hemispheres of the Earth do not face the Sun in the same manner all year long**. For a few months, it is the northern hemisphere that faces our star, followed by a period of equal facing for the northern and southern hemisphere. That, is itself followed by a period of the southern hemisphere pointing toward the Sun, which is itself then followed by a period of equal facing. And so on and so forth.

If you haven't already guessed, we've just described Summer, Autumn, Winter and Spring for the northern hemisphere.



This leads us to yet another misconception: **(C)** that the seasons start at the 1st of the calendar months of

1st September = autumn

1st December = winter

1st March = spring

1st June = summer

The proper dates for the beginning of the seasons are during the *equinoxes* and the *solstices*. These happen roughly around

the 21st of December,

the 22nd of March,

the 21st of June and

the 22nd of September,

but exact dates vary with respect to geographical latitude. During the equinoxes, a day and a night last for an approximately equal amount of time. The summer solstice is known to be the longest day of the year, while its winter counterpart is known to be the shortest day (or the longest night!). Many traditional festivities across Europe, trace their roots to celebrations and festivals during these **yearly milestones**.

#### Comprehension Questions:

- Name three (3) widespread misconceptions regarding the motion of the Earth.
- What is the aphelion and what is the perihelion?
- When is the Earth closer to the Sun: during the winter or during the summer?
- Is it wrong to say that Spring starts on April 1?