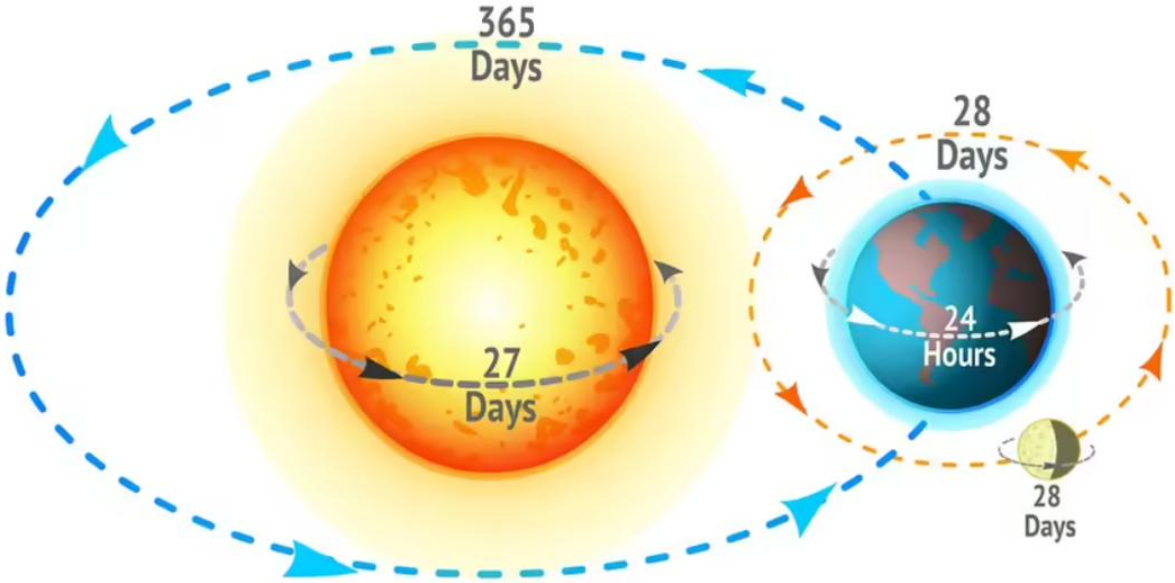
Understanding Earth's Rotation, Revolution, and Seasons

Have you ever wondered why we have **day** and **night** or why we experience different **seasons** throughout the year? This article will explain the Earth's **rotation**, **revolution**, and how they create **day** and **night** and cause the **seasons**, including the **summer** and **winter solstices**.



Earth's Rotation: Day and Night

The Earth **rotates** (spins) on its **axis**, which is an imaginary line that runs from the **North Pole** to the **South Pole**. The Earth takes about **24 hours** to complete one full **rotation**. This is what causes **day** and **night**. When one side of the Earth faces the **Sun**, it is **day** there. On the opposite side, it is **night**.

Example:
If it's **daytime** in the **United States**, it's **nighttime** in places like **Japan**, which are on the opposite side of the Earth.

Earth's Revolution: Changing Seasons

In addition to rotating, the Earth also **revolves** (orbits) around the **Sun**. It takes about **365 days** to complete one full **revolution**. This movement is what causes the **seasons**—**spring**, **summer**, **fall**, and **winter**.

Earth's **axis** is tilted at an angle of **23.5 degrees**, meaning that different parts of the Earth get more or less sunlight throughout the year. When the **Northern Hemisphere** is tilted toward the **Sun**, it is **summer** there, while the **Southern Hemisphere** experiences **winter**. When the **Southern**

Hemisphere is tilted toward the Sun, the Northern Hemisphere experiences winter, and the Southern Hemisphere experiences summer.

Both the Earth's tilt and its revolution around the Sun work together to create the four seasons (spring, summer, fall, winter). The tilt determines how much sunlight each part of the Earth gets, and the revolution explains why the seasons change over the course of the year.

- Tilt is responsible for creating the seasonal differences (more sunlight = summer, less sunlight = winter).
- Revolution is responsible for the timing of the seasons as Earth moves around the Sun.

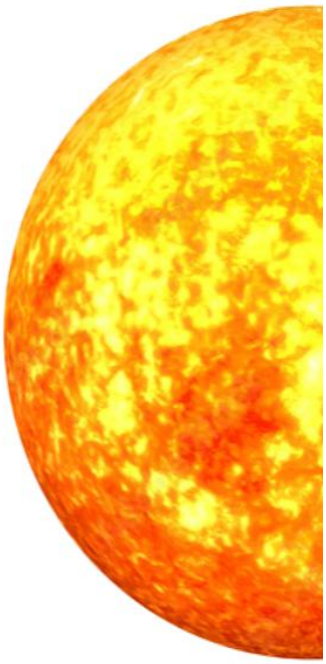
Example:
In the summer, the days are longer because the Sun's rays hit the Northern Hemisphere more directly. In winter, the days are shorter, and the Sun's rays hit the Earth at a lower angle.

Summer and Winter Solstices

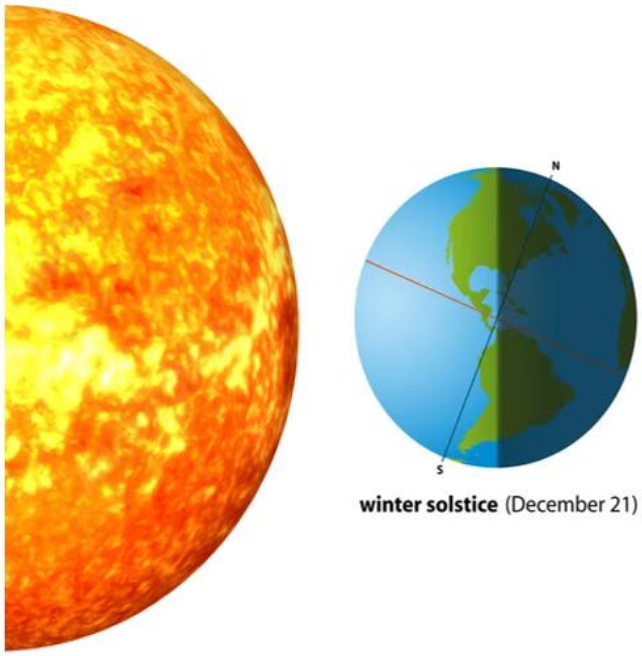
The solstices are key moments in the Earth's orbit when the tilt of the Earth is most noticeable. There are two main solstices:

1. Summer Solstice: This occurs around June 21 in the Northern Hemisphere. It is the longest day of the year, meaning that the Northern Hemisphere is tilted closest to the Sun. During this time, people in the Northern Hemisphere experience the beginning of summer.

summer solstice (June 21)



2. **Winter Solstice**: This occurs around **December 21** in the **Northern Hemisphere**. It is the shortest day of the year, meaning that the **Northern Hemisphere** is tilted furthest from the **Sun**. This marks the beginning of **winter** in the **Northern Hemisphere** and **summer** in the **Southern Hemisphere**.



Example:
On the **summer solstice**, places like the **United States** have the most **daylight** hours, while on the **winter solstice**, they have the least amount of **daylight**.

Why Seasons Change

Seasons change because of the Earth's **tilt** and **revolution**. The **tilt** means that different parts of the Earth are closer to or farther from the **Sun** at different times of the year. In **summer**, the **Northern Hemisphere** is tilted toward the **Sun**, and in **winter**, it's tilted away. The same thing happens in the **Southern Hemisphere**, but the **seasons** are opposite.

Example:
When you experience **summer** in the **United States**, people in **Australia** are experiencing **winter** because of the opposite **tilt**.

Everyday Life Application

Understanding the Earth's **rotation** and **revolution** helps us understand why we need to adjust our daily routines throughout the year. For example:

- **Daylight Saving Time**: Some countries adjust their clocks during the **summer** months to make better use of **daylight**.

- **Agriculture**: Farmers use the **seasons** to know when to plant and harvest crops. For instance, **winter wheat** is planted in the **fall** and harvested in the **summer**.
- **Clothing**: The changing **seasons** affect the clothes we wear. In **summer**, we wear lighter clothes, while in **winter**, we wear warmer layers.

Important Vocabulary

- **Rotation**: The spinning of the Earth on its **axis**, causing **day** and **night**.
- **Revolution**: The Earth's **orbit** around the **Sun**, which causes the **seasons**.
- **Axis**: An imaginary line around which the Earth rotates.
- **Tilt**: The slant of the Earth's **axis**, which affects how much **sunlight** different parts of the Earth receive.
- **Season**: One of the four periods of the year (**spring**, **summer**, **fall**, **winter**) that are caused by the Earth's **tilt** and **revolution**.
- **Solstice**: The two times in the year when the **tilt** of the Earth is most noticeable, marking the start of **summer** and **winter**.

References:

- NASA. (n.d.). Earth's **Rotation** and **Revolution**. Retrieved from NASA Earth Science
- National Geographic. (2020). What Causes the **Seasons**?. Retrieved from National Geographic Kids