

### Key Facts

Stars are held together in a galaxy by gravity. (Our star, the Sun, is in the Milky Way galaxy.) 'Constellation' is commonly used for a pattern of stars in a clearly defined area of the sky. These stars may be vast distances apart and in different galaxies. The stars are called fixed because they were long believed not to move. Galaxies rotate: the distances between them are so great that this can only be detected using modern scientific equipment. The sky today looks as it did thousands of years ago and many of the constellations were named in ancient times.

Earth and other planets orbit the Sun anticlockwise, causing an apparent shift in the positions of the stars over the year. This is not to be confused with the apparent rotation of the stars around the North Star Polaris, which is caused by the Earth's rotation.

The ancient Sumerians based time around the number 60 - the smallest number divisible by every number from 1 to 6. This simplifies fractions based on 60: an hour can easily be divided into segments of 30, 20, 15, 12, 10, 6, 5, 4, 3, 2 and 1 minute. The measurement of angles is based around 60 for the same reasons, making the analogue clock face ideal for measuring time. Great Britain and Ireland adopted the local time of London (Greenwich) as standard time.

The world was divided into 24 time zones (one for each hour of the day), each covering 15° of longitude. The time for each zone is that of the meridian (line of longitude) that passes through its centre.

A starting point was established as the meridian that passes through the Greenwich Observatory (the zero or prime meridian).

The solstices are the 'longest' and 'shortest' days (with the longest or shortest period of daylight): June 20th/21st and December 22nd/23rd. Arctic and Antarctic regions have 24-hour, or almost 24-hour, daylight or night. Days and nights in tropical and equatorial regions are equal, or almost equal, in length throughout the year

Daylight Saving, in which clocks are adjusted by an hour (for example, British Summer Time), affects times in many countries.

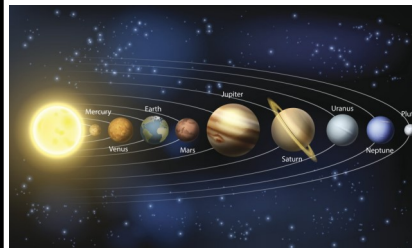


## Science

### Year 5

### Spring 1

## The Earth and Beyond



### Vocabulary

Word	Definition
Asteroid	Small planets found between orbits of Mars and Jupiter.
Axis	A line through the centre of a spinning object
Compass	An instrument with a magnetized needle that shows which direction you are facing.
Crescent	A narrow curved shape pointed at both ends.
Equator	An imaginary line round the earth at an equal distance from the North and South poles.
Equinox	The time of year when day and night are equal in length.
Galaxy	A very large group of stars,
Orbit	The curved path taken by something moving round a planet or other body in space.
Solstice	Two times of the year when the sun is at its furthest point north or south of the equator.

### Common misconceptions:

Children often think that day and night are caused by the Earth orbiting the Sun (or even the Sun orbiting the Earth, rather than the Earth's rotation on its axis). Children may think that stars are 'star-shaped' with five points. • Children may think that the Moon gives out light - actually it reflects light from the Sun. • Children may consider the Universe to be the same thing as the solar system, with no other suns or planets; a solar system is a star with planets orbiting round it; a galaxy consists of hundreds of billions of stars, all of which are potential solar systems. • Children may think that the change in shape of the Moon during the course of a month is to do with light being blocked when it is actually caused because the portion of the Moon and the Sun's reflection on it keeps changing, so we see it part-illuminated

### Knowledge and Understanding:

#### Children will learn:

- In this module children develop their knowledge of the Earth's (and other planets) place in the solar system and their relationships with other bodies in space, in particular with the Sun.
- Children also learn how the Earth's orbit determines the length of a year and why we have leap years.
- Children also learn how the Earth's rotation and tilt affect the direction and length of shadows, and how to use shadows for telling the time.
- They will find out about how time was standardised around the world, about the need for scientists to choose a starting point in the continuous process of cycles of sunrise and sunset, and investigate longitude. They are introduced to the International Date Line and the Greenwich Meridian.
- Children to understand that it is the Earth's tilt on its axis that causes the seasons. This draws on their learning about the Sun and shadows to develop an understanding of the role of latitude in day length and seasons.

### Key skills and concepts:

#### Children will be able to:

- They report and present findings in different ways, including booklets, oral presentations and annotated diagrams, draw conclusions, identify causal relationships and explain their thinking.

### Key Questions

- What is in space?
- What is a year?
- What is a day?
- How does the sun help us to measure time?
- Can you describe how the Sun's apparent movement across the sky from east to west affects directions of shadows?
- Why do we have seasons?
- Why does the moon change shape?