To the Stars!

In this unit, children will explore the Earth and Space.

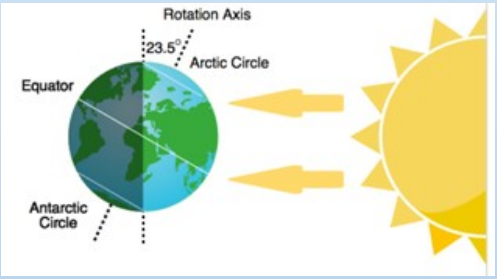
What we should already know:

- We have four seasons (autumn, winter, spring and summer).
- The Sun is a source of light but the Moon is not.
- A shadow is caused when an object blocks light from passing through it.
- The properties of a sphere.

Key Content:

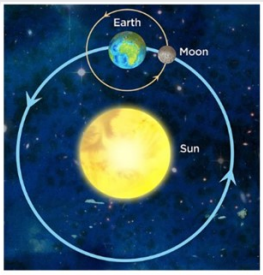
Day and night

- The Earth rotates on its axis anti-clockwise and makes a complete rotation over 24 hours (a day).
- Different parts of the Earth experience daylight at different times. This means that it is morning, afternoon and night in different places. This is also the reason why we have time zones.
- Because of the Earth's tilt, the poles experience 24 hours of sunlight in the summer, and very few hours of sunlight in the winter.
- As the Earth rotates, shadows that are formed change in size and orientation.



Year length and the seasons

- The Earth takes 365 and a quarter days to orbit the Sun.
- Because of the extra quarter day it takes to orbit the Sun, every four years on Earth is a leap year!
- It is the Earth's tilt that causes the seasons.



The Sun, Earth and Moon are approximately spherical.
The Earth orbits the Sun.
The Moon orbits Earth.

Key Scientists

Aristarchus (310 – 230 B.C.). He was the first to figure out that the Earth travels around the Sun.

Nicolas Copernicus (1473 – 1543). Had the idea that Earth revolves on its axis and the Earth and other planets orbit around the Sun

Galileo Galilei (1564 – 1642). Discovered four of Jupiter's moons. In 1609 was the first person to make a study of the skies with a telescope.

Edwin Hubble (1889-1953). In 1924 Hubble showed that nebulae (fuzzy light patches in the sky) were distant galaxies. In 1929 he found the speed of galaxy moves away from the Earth depends on its distance from the Earth. If a galaxy is four times as far away as another, it is moving four times as fast. This is Hubble's law.

William Huggins. Showed that stars are made up of the same elements that exist on Earth.

Cecilia Payne-Gaposchkin (1900-79). In the 1920's she proved that stars are made mostly of hydrogen.

Arthur Eddington (1882- 1944). He was the first to work out what the inside of a star was like.

Professor Brian Cox (1968 -) Contemporary physicist, presents many BBC programmes.

Heidi Hammel (1960 -) Astronomer

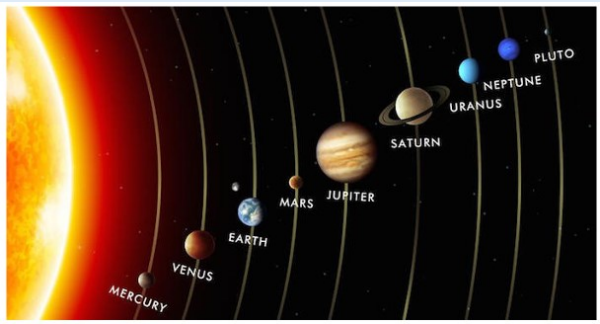
Key content:

The Moon

- The Moon orbits the Earth anti-clockwise and takes approximately 28 days.
- The Moon spins once on its axis every time it orbits Earth. This means that we only see one side of the Moon.
- The Moon has different phases depending on where it is in its orbit.
- The Moon's gravity causes high and low tides.

The Solar System

- There are 8 planets in our Solar System (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune). Pluto is a dwarf planet.
- They all orbit the Sun, which is a star, and they all have moons.
- The first four planets are relatively small and rocky, while the four outer planets are gas giants (Jupiter and Saturn) or ice giants (Uranus and Neptune).
- There are also asteroids, meteoroids and comets in the Solar System.
- The Solar System is in a galaxy called the Milky Way.
- The galaxy is in the universe.



Timeline of Key Events:

1942—the German V2 was the first rocket to reach 100km from the Earth's surface (the boundary of space).

1947, the first animals were launched into space.. Fruit flies were used to study the effects of space travel on animals.

14th June 1949—Albert II, a Rhesus monkey, was the first monkey in space.

4th October 1957- Russia launched the first satellite into space; Sputnik 1.

November 1957—the Russian space dog Laika became the first animal to orbit the earth.

1959—American and Russian scientists were in a race to get a spacecraft to the Moon; the Russians made it first with the space-probe Luna 2, which crash-landed into the moon.

12th April 1961—Russian Cosmonaut Yuri Gagarin became the first man in space.

20th July 1969— Neil Armstrong, and then Buzz Aldrin took "one small step" and became the first men on the moon.

Key Vocabulary:

Asteroid - a rock that orbits the Sun in a belt between Mars and Jupiter

Axis—an imaginary line through the middle of something

Comet—a bright object with a long tail that travels around the Sun

Galaxy—an extremely large group of stars and planets. Our galaxy is called the Milky Way.

Gravity—the force which causes things to drop to the ground.

Meteorite—a rock from outer space that has landed on Earth

Orbit—the curved path in space that is followed by an object going round and round a planet, moon, or star planet a large, round object in space that moves around a star

Shadow—a dark shape on a surface that is made when something stands between a light and the surface

Solar System—the Sun and all the planets that go round it

Sphere —an object that is round in shape like a ball spin turns quickly around a central point

Star—a large ball of burning gas in space

Time zones—one of the areas into which the world is divided where the time is calculated as being a particular number of hours behind or ahead of GMT (Greenwich Mean Time)

Universe—the whole of space and all the stars, planets, and other forms of matter and energy in it