



Subject: Science
 Year group: 5
 Term: Spring
 Unit name: Earth and space

Prior Knowledge - Observe changes across the four seasons. (Y1 - Seasonal changes) Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)

Scientific enquiry

Classifying	Terrestrial, gas giant and ice giant planets Planet names, properties and distance from the sun Moon and movement
Observing over time	Comparing times of the day and night Creating simple sundials Appearance of the moon over time
Pattern seeking	Not relevant
Comparative/fair testing	Not relevant
Researching	Stonehenge as an astronomical clock How the universe was formed Planets

National curriculum:

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- Describe the movement of the Moon relative to the Earth.
- Describe the Sun, Earth and Moon as approximately spherical bodies.
- Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.

Assessment for learning

Recapping prior knowledge- beginning of unit- what do children already know?

Beginning of each lesson- focus on recall of previous learning (quick quizzes)

Topic: Earth and Space

Year Five

Strand: Physics

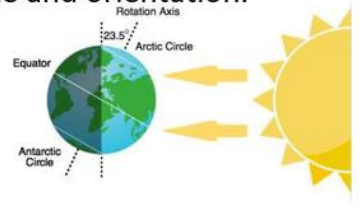
What should I already know?

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

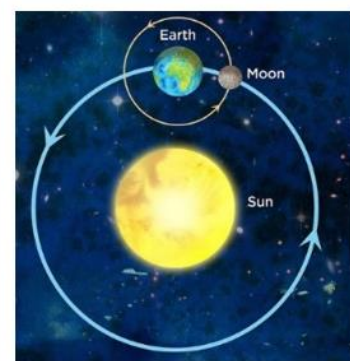
What will I know by the end of the unit?

What causes day and night?

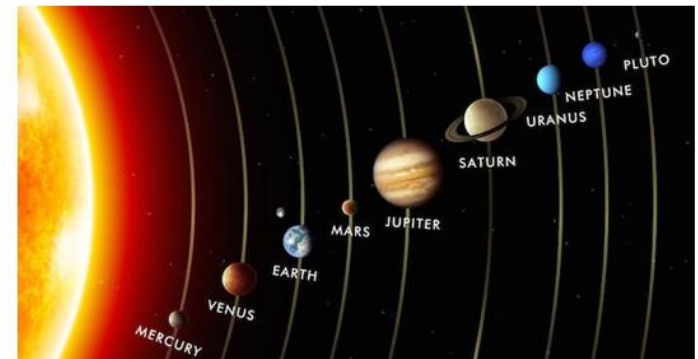
- The Earth **rotates** on its **axis** anti-clockwise and makes a complete **rotation** over 24 hours (a day).
- This makes it appear as the Sun moves through the sky but the Earth's **rotation** causes day and night.
- Different parts of the Earth experience daylight at different times - this means 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.



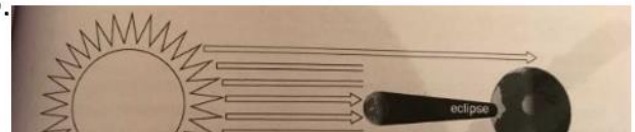
Other Diagrams

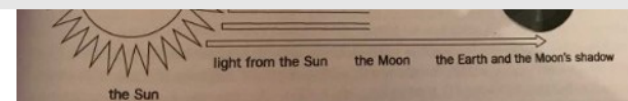


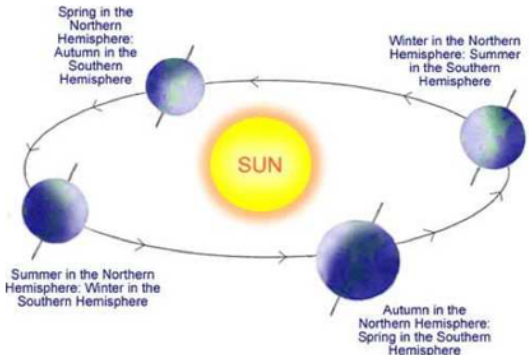
The Sun, Earth and Moon are approximately **spherical**.
 The Earth **orbits** the Sun.
 The Moon **orbits** Earth.



When the Moon passes between the Sun and Earth, the **shadow** cast by the Moon falls on the Earth's surface and we would no longer be able to see the Sun. This is called a **solar eclipse**.





<p>Year length and the seasons</p>	<ul style="list-style-type: none"> 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. 
<p>The Moon</p>	<ul style="list-style-type: none"> The Moon orbits the Earth anticlockwise 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.
<p>What is the Solar System?</p>	<ul style="list-style-type: none"> 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,

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
leap year	a year which has 366 days. The extra day is the 29th February. There is a leap year every four years
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



Enriching lives every day; enabling our school community to learn, achieve and flourish
through living 'life in all its fullness'



- 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**.

forms of matter and energy in it

Investigate!

- Compare the time of day at different places on Earth.
- Construct shadow clocks and sundials.
- Keep a Moon diary over the course of a month - what do you notice?

Lesson Sequence



1. Explore the solar system and its planets.



2. Understand the heliocentric model of the solar system.



3. Explain Earth's movement in space.



4. Explain the Earth's rotation and night and day.



5. Explain the movement of the Moon.



6. Design a planet using knowledge gained.

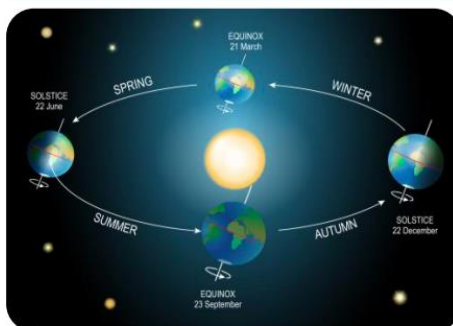
The Solar System



Mercury
Venus
Earth
Mars
Jupiter
Saturn
Uranus
Neptune

Copernicus developed the heliocentric theory that the sun was at the centre of the solar system. The planets orbit the sun in a circular pattern. Each planet has its own characteristics and features. The four inner planets are the rocky terrestrial planets. The four outer planets are the gas giants.

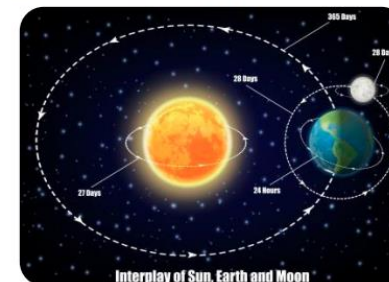
Moon Phases



The moon orbits Earth in an oval pattern whilst spinning on its axis. The sun illuminates the Moon. The shadow of the Earth creates the moon's phases.

Earth's movement

The Earth spins on its axis and completes a full rotation every 24 hours. The Earth is constantly rotating and orbiting the Sun - which takes 365 days. As the Earth rotates, it faces towards and away from the Sun. This creates the day and night cycle.



The Sun

The Sun is a burning ball of gas which appears to move across the sky during the day. However, this movement is actually due to the Earth's orbit around the sun.