Marhamchurch CofE Primary School - Science

Topic: Earth and Space	Class 4	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**.

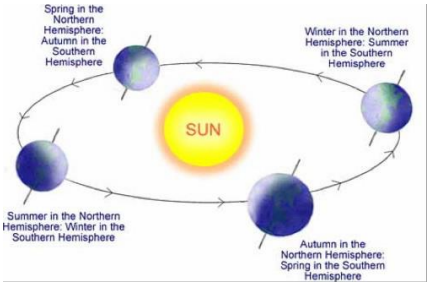
What will I know by the end of the unit?

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.

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.



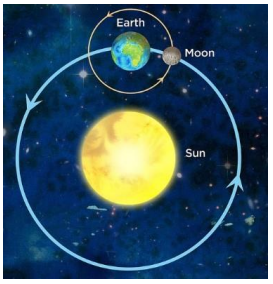
The Moon

- 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.

What is 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**.

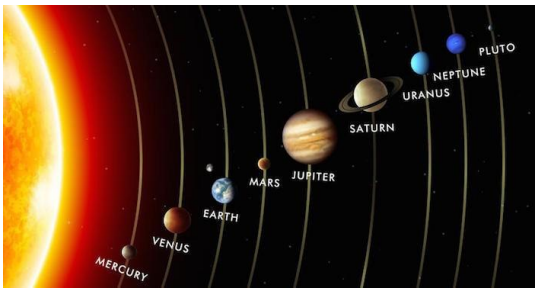
Other Diagrams



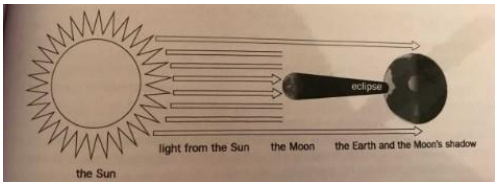
The Sun, Earth and Moon are approximately **spherical.**

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**.



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 goinground 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

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?

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Question 1: Which of these causes day and night?	Start of unit:	End of unit:
The Sun moves across the sky.		
The Earth rotates on its axis		
The Earth orbits the Sun.		
The Moon comes out at night.		

Question 2: How long does it take the Earth to orbit the Sun?	Start of unit:	End of unit:
365 and a quarter days		
28 days		
24 hours		

Question 3: The seasons are caused by…	Start of unit:	End of unit:
the weather		
the Moon		
the Earth's rotation on its axis		
the Earth's tilt as it orbits		

Question 4: The Solar System includes...	Start of unit:	End of unit:
the Sun		
the planets		
asteroids, meteorites and comets		
all of the above		

Question 5: What do the Sun, Earth and Moon all have in common?	Start of unit:	End of unit:
They all move in space		
They are the same size		
They are all approximately spherical		
They are all stars		

Question 6: Time zones are caused by..	Start of unit:	End of unit:
the Moon's orbit		
the Sun moving across the sky		
the Earth's rotation on its axis		
the Earth's tilt as it orbits		

Question 7: The Sun's _____ keeps the planets orbiting it	Start of unit:	End of unit:
gravitational pull (gravity)		
burning gas		
spherical shape		

Question 8: A solar eclipse is when…	Start of unit:	End of unit:
the Moon passes between the Sun and the Earth		
the Moon comes out in the day		
the Earth stops orbiting the Sun		
the Sun moves in front of the Moon		

Question 9: Jupiter, Saturn, Uranus and Neptune are known as...	Start of unit:	End of unit:
the rocky planets		
the gas and ice giants		
asteroids		
dwarf planets		

Question 10: Write the order of the planets from the distance of the Sun (with the closest planet being number 1).	Start of unit:	End of unit:
Venus		
Earth		
Jupiter		
Neptune		
Mars		
Saturn		
Mercury		
Uranus		