

YEAR 5: SPRING 2 – OCEAN SURVIVORS

SCIENCE: EARTH AND SPACE

UNDERSTAND, DESCRIBE AND EXPLAIN:

To describe the Sun, Earth and Moon as approximately spherical bodies

Stars	Planets	Satellites	Spherical	Orbit	Rotate	Gaseous planets	Rocky planets
Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune
Sun	Moon	Orbit					

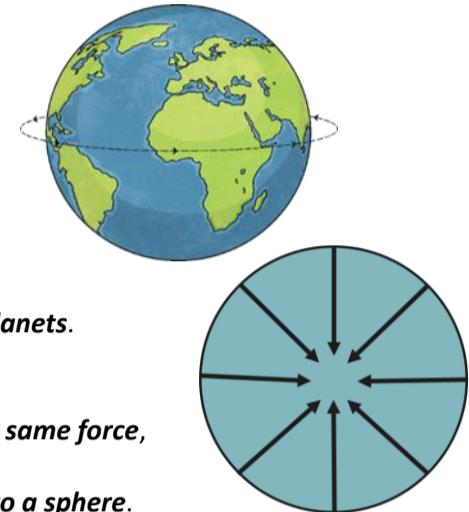
Our Solar System:

The **Sun** and **eight planets** make up our **solar system**. There are many **other objects** in the solar system too, such as **moons, comets, asteroids** and **dwarf planets**. You can use this mnemonic to remember the order of the planets (this one includes Pluto).

My	Very	Easy	Method	Just	Speeds	Up	Naming	Planets
Mercury	Venus	Earth	Mars	Jupiter	Saturn	Uranus	Neptune	Pluto (Dwarf Planet)

There are **4 rocky planets** (Mercury, Venus, Earth and Mars) and **4 gaseous planets** (Jupiter, Saturn, Uranus and Neptune).

Each planet is unique and, as far as we know, Earth is the only planet able to support life.



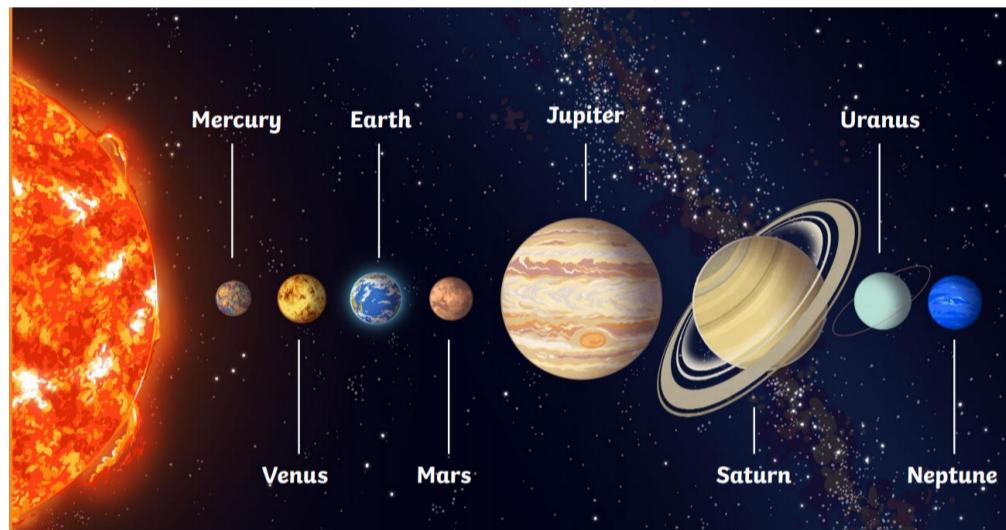
Planets as spherical bodies:

Planets are referred to as '**spherical bodies**' because, to be classed as a **planet**, something has to:

- be **roughly spherical**;
- **orbit the Sun**;
- **not orbit another planet**;
- be **big enough** to have cleared away any bits floating near to it.

This tick list fits for **planets** made out of **rock** as well as those made from **gases**.

Stars and **moons** are also spherical objects but, because they **do not meet ALL of the criteria**, they are **not planets**.



Our star – The Sun:

The **sun** is a **star** at the **centre** of our **solar system**. That is why it is called a **solar system**: The word '**solar**' means '**relating to the sun**'. The **planets** in our **solar system** stay together because the **sun** is so **big** that its **gravity** keeps us all **locked in orbit**.

The **sun provides** almost all the **energy, light** and **heat** needed on **Earth** mainly using **hydrogen** and **helium**. **Energy** is **made** at its **core** (centre). Around the **core** is a **radiative zone**, which carries the **energy** to the next layer – the **convection zone**. It takes about **170,000 years** for the **energy** to move from the **core** to the **convection zone**. The **photosphere** is at the surface and the **energy** reaches here in large bubbles from the **convection zone**. From the **surface**, the **energy escapes** and some of it **travels** to Earth. It takes about **8 minutes** for **heat** from the **sun** to reach us on **Earth**.



Did you know?

Surface temperature: 5505°C
Distance to Earth: 149.6 million km
Radius: 696,342 km
Circumference: 4,366,813 km (2,713,406 miles)
Mass: 1,989,000,000,000,000,000,000kg
(About 1.3 million Earths could fit inside the Sun)

What is an orbit?

Every **planet** in the **solar system** moves **anticlockwise** around the **Sun**, following a **curved path** called an **orbit**. Although it looks like some of them are **orbiting** in a circle, each planet's **orbit** around the **Sun** is shaped like an **ellipse**.

When a planet makes **one complete orbit** around the **Sun**, this is counted as **one year** on that planet. The time that it takes each **planet to orbit once around the Sun** depends on how **fast** the planet is **travelling** and how **far away it is from the Sun**. This means that a **year** lasts for **different lengths of time on different planets**. Which planet do you think has the longest year?



The **planets orbit** the Sun because they are caught by the **Sun's massive gravitational force**.

Without the **pull** of the Sun's **gravity**, the **planets** would no longer follow their **paths** around the Sun and would go **flying off in a straight line** into space. In the same way that each **planet orbits** the **Sun**, most **planets** are also **orbited** by **smaller objects** that are **caught** by the **planet's gravity**. For example, **Earth** is **orbited** by the **moon**. Some planets are orbited by lots of moons.

UNDERSTAND, DESCRIBE AND EXPLAIN:

To describe the movement of the Earth, and other planets, relative to the Sun in the solar system	Year	Orbit	Planets	Sun	Solar System	Spherical	Rocky	Gaseous																																
	Day	Night	Rotate	Rotation	Axis	Gravity	Mass	Atmosphere																																
	Moon	Natural satellite	New moon	Crescent moon	Half moon	Gibbous moon	Full moon	Months																																
What is a year?																																								
<p>A year is the amount of time it takes for a planet to orbit once around the Sun. On Earth, a full orbit of the Sun takes 365.26 days. This is why, every four years, we hold a 'leap year' of 366 days to make up for the quarter of a day that is missed the other years.</p> <p>The time that it takes each planet to orbit once around the Sun depends on how fast the planet is travelling and how far away it is from the Sun. This means that a year lasts for different lengths of time on different planets.</p> <p>Here is a table showing the length of a year on each planet in our Solar System:</p> <p>As you can see, the further away the planet is from the Sun, the longer its year is. This is because its spherical orbit is much larger and so will take much longer.</p>																																								
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<p>Each planet also spins on its axis as it moves. A day is the amount of time it takes a planet to complete one full rotation on its axis. In one full day, we see the Sun rise, set and rise again. On Earth, one full rotation takes 24 hours.</p> <p>It is daytime for the part of the planet that is facing the Sun and night-time for the part that is facing away. As some planets spin faster than others do, the length of a day can vary greatly between different planets. Here is a table showing the length of a day on each planet in our Solar System:</p>																																								
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What about the Moon?																																								
<p>We now know that all planets orbit the Sun and that, because of the enormous mass and gravity of the Sun, everything in our Solar System is held in orbit. However, the planets are not the only things in orbit. Each planet has its own gravitational force. The greater the mass of the planet, the greater its gravitational force.</p> <p>Because of this gravitational pull, planets are able to keep other things in orbit such as atmosphere, satellites and moons. The Moon is the Earth's only natural satellite (an object orbiting a larger object). It takes the Moon approximately 28 Earth days to orbit the Earth once. We call this a lunar month and is where our use of months came from.</p> <p>Here is a table showing the number of moons each planet in our Solar System has:</p>																																								
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The Phases of the Moon:																																								
<p>The Moon shines extremely brightly but is only reflecting the rays of the Sun. The Moon can not make its own light as it is not a star like the Sun. The Moon appears to disappear from sight during the day but, actually, the Moon is still there but harder to see because of the brightness of daytime.</p> <p>During its orbit, the angle between the Earth, Moon and Sun changes so the part of the Moon that is lit up can not always be seen by us on Earth. This is what gives us the phases of the moon and why it looks a different shape to us.</p>																																								

KEY ASSESSMENT QUESTIONS AND SCENARIOS:

EXS:

- *Why are planets described as 'spherical bodies'?
- *Can you name and order the planets in our Solar System?
- *Explain why ____ is classified as a planet but Pluto is not.
- *What is the difference between a day and a year?
- *Explain why and how a day is different on varying planets.
- *Explain why and how a year is different on varying planets.
- *How is a moon different to a planet?
- *Explain how and why the moon appears to change shape in the sky.
- ***EXIT TASK:** Explain what a **day** is using the key words **rotate** and **axis**.

Using the key words: **phases, reflect, new, crescent, half, full and gibbous**, describe the movement of the Moon in relation to the Earth.

GDS:

- *Why do we have a leap year?
- *Does ____ take longer to orbit the sun than ____? Why?
- *Why does the Sun rise in the east and set in the west?
- *Which other planets have moons? Why do you think that Mercury and Venus do not have moons?
- *What is the difference between a moon and a planet? What would a moon need to do to become a planet?
- ***EXIT TASK:** Using **ALL** of the key words above (in the boxes) at least once, explain **day, night, months, years** and the **movement of the moon** in relation to Earth.