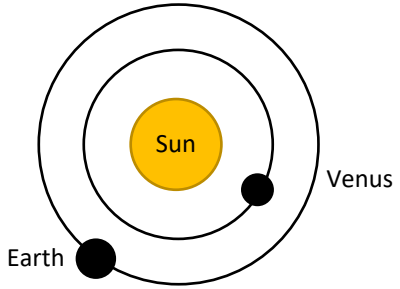
Science KS3 **Space**

Glossary:

- **Asteroid**
  Small rock orbiting a star.
- **Comet**
  Orbits a star, made of ice and dust and may have a tail' of gas when near a star.
- **Earth** Our planet.
- **Earth's Axis**
  Imaginary line between the north and south poles.
- **Galaxy**
  A group of billions of stars.
- **Light year**
  The distance light travels in a year.
- **Milky Way**
  Our galaxy.
- **Moon** Orbits a planet.
- **Orbit**
  The path of an object around a star, planet or moon.
- **Planet**
  Large object which orbits a star.
- **Rotates** Turns.
- **Satellite**
  Orbits a planet. Can be natural – moon or artificial.
- **Seasons**
  Spring, summer, autumn and winter.
- **Star**
  A large ball of gases which generates light and other energy.
- **Sun**
  The star at the centre of our solar system.
- **Tilted**
  At an angle.
- **Universe**
  Everything in existence.
- **Year**
  Time taken for a planet to orbit the Sun once.

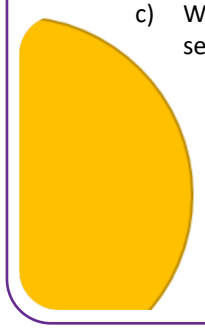
Activities

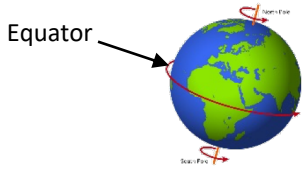
- Look at the diagram below (not to scale). A person standing on the Earth can see Venus even though it does not produce its own light.



a) Name the planet which is between Venus and the Sun.
b) Explain why Venus takes less time than the Earth to orbit the Sun.
c) Explain why Venus can be seen from Earth. You can draw a ray diagram to explain your answer.

- Look at the diagram of the Earth and Sun.
  a) Explain why the Earth has seasons.
  b) Look at the northern hemisphere (the half of the planet above the equator). What season is it in?
  c) What needs to happen for the season to change?





- Place the following in order of size, from the smallest to the largest.
  Solar system, planet, galaxy, asteroid, universe, Moon, Sun

- Explain the advantages and disadvantages of sending a robot to explore Mars.

- Neptune is 4.5 billion km from the Sun, 30 times further than the Earth. Calculate how far away the Earth is from the Sun.

QUICK QUESTIONS:

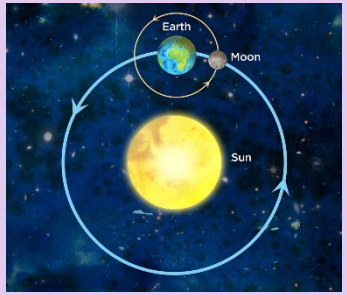
1. Name the 8 planets in our solar system, in order from the Sun.
2. Name the Earth's nearest star.
3. What is an asteroid?
4. How long does it take the Earth to orbit the Sun?
5. Why do we have day and night?
6. Why do we have seasons?
7. How have we explored distant parts of our solar system?
8. What is a light year? What is it used for?
9. What is the name of our galaxy?
10. What is the universe?

1. Our solar system

- The **Sun**, a **star** at the centre of our **solar system**, is its only source of **visible light**.
- Our Solar System contains:
  - 8 planets
  - Dwarf planets
  - Moons
  - Asteroids
  - Comets.

2. The Earth's orbit

- The Earth moves around the Sun in an **orbit** which takes a **year (just over 365 days)**.
- Planets orbit the Sun in roughly circular orbits.
- The force of **gravity** keeps planets in orbit.

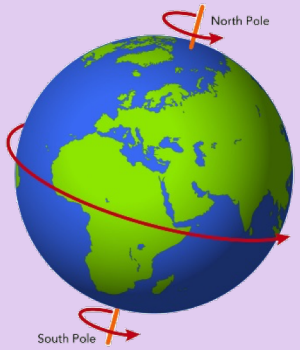


3. The Earth's rotation

- The Earth **rotates** about its north to south axis. This makes it appear that the Sun and stars are moving around the Earth.
- This rotation causes **day and night** as different parts of the Earth face towards or away from the Sun.
- It takes about 24 hours for the Earth to spin in its axis.

4. A tilted Earth

- The Earth's axis is **tilted** so that the length of the day varies depending on the position the Earth and the time of year.
- This causes the **seasons.**



5. The Moon

- The **Moon** is a natural **satellite** which orbits the Earth, taking about 4 weeks to complete an **orbit**.
- The Moon **reflects light** from the Sun as it moves around the Earth. Only the parts lit by the Sun's rays are seen.
- Other planets also have moons.

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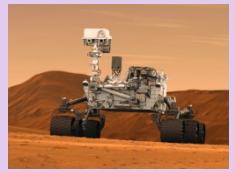
6. The planets

- The Earth is one of eight known planets in the Solar System: **M**ercury, **V**enus, **E**arth, **M**ars, **J**upiter, **S**aturn, **U**ranus and **N**eptune.
- The planets are different distances from the Sun and have **different orbits**; they take different amounts of time to orbit the Sun.
- The distances between planets is huge – Neptune is 4.5 billion km from the Sun, 30 times further than the Earth.

7. Exploring the solar system

- Exploring the solar system is possible with **robot missions,** e.g. exploration of the planets by Voyager I and II.
- Exploring shorter distances from the Earth is possible by humans, e.g. the International Space Station (ISS) and the Moon.



8. The Universe

- The solar system is part of a **galaxy** of stars, dust and gas, called the **Milky Way**.
- Our galaxy is one of many billions in the **Universe.**
- These galaxies are enormous distances apart so the **light year** is used as a unit of distance. This is the distance light would travel in a year.
- Many other stars appear to have planets, some of which may be able to support life.