

# Knowledge Organiser - Year 5 - Science: Earth and Space



**Space** -The physical universe beyond the Earth's atmosphere. Intergalactic space takes up most of the volume of the universe.

## Key Vocabulary

<b>Asteroid</b>	A small rocky body orbiting the sun.
<b>Axis</b>	An imaginary line about which a body in space, like the Earth rotates.
<b>Celestial</b>	Positioned in or relating to the sky, or outer space as observed in astronomy.
<b>Equinox</b>	The time of the year when day and night are each 12 hours long and the Sun is at the midpoint of the sky (about 21st September and 21st March).
<b>Lunar Eclipse</b>	A lunar eclipse can only occur when there's a full moon and the Sun, Earth and Moon are exactly aligned, in that order. The Moon moves into the Earth's shadow.
<b>Moon</b>	A natural satellite of any planet.
<b>Orbit</b>	The regularly repeated oval course of a celestial object around a star or planet.
<b>Planet</b>	A celestial body moving in orbit round a star.
<b>Rotation</b>	The action of rotating about an axis or centre.
<b>Seasons</b>	Each of the four divisions of the year (spring, summer, autumn, and winter) with changing amounts of daylight hours, resulting from the Earth's rotation of the sun while being on a tilted axis.
<b>Solar Eclipse</b>	The light from the sun is blocked out by the moon when looking from Earth.
<b>Solar System</b>	The collection of eight planets and their moons in orbit round the sun.
<b>Sphere</b>	An object shaped like a round ball—the shape of all planets or stars; A celestial <i>sphere</i> .
<b>Star</b>	A very large ball of bright glowing hot plasma in space. Stars are held together by gravity. They give out heat and light because they are very hot.
<b>Sun</b>	The star around which planets orbit. The word solar means 'relating to the sun'.
<b>Waning</b>	This means a progressively smaller part of the moon is lit up, so that it appears to decrease in size. A crescent moon is smaller than a half moon.
<b>Waxing</b>	This means a growing amount of the moon is lit, until a full moon is reached. More than a half moon is called a gibbous moon.
<b>Year</b>	The time taken by the Earth to make one revolution around the sun (365.25 days).

## Working Scientifically

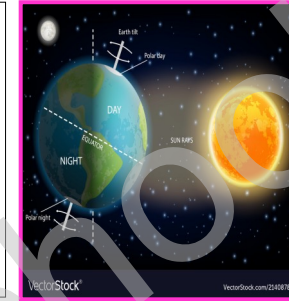
Explore ideas and raise different kinds of questions; They should recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. They should use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas and should talk about how scientific ideas have developed over time.

## Key Question: How do the objects in our Solar System move?



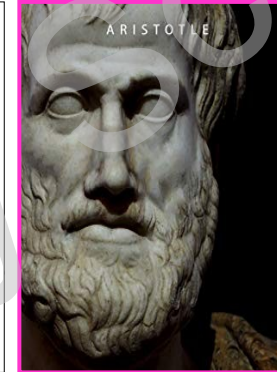
### Nicolaus Copernicus

(1473 -1543) was a Polish astronomer who put forth the theory that the Sun is at rest near the centre of the Universe, and that the Earth, spinning on its axis once daily, revolves annually around the Sun. This is called the heliocentric, or Sun-centred, system.



Day and night is caused by the Earth rotating on its axis to either face the sun (day) or face away from the sun (night). Because our axis is on a tilt, we also experience seasons, where different times of the year, place us nearer the sun (summer) or tilted away and therefore colder, (winter).

**Aristotle** (384-322 BC) believed the Earth was round. He thought Earth was the centre of the universe and that the Sun, Moon, planets, and all the fixed stars revolved around it. Aristotle's ideas were widely accepted by the Greeks of his time.



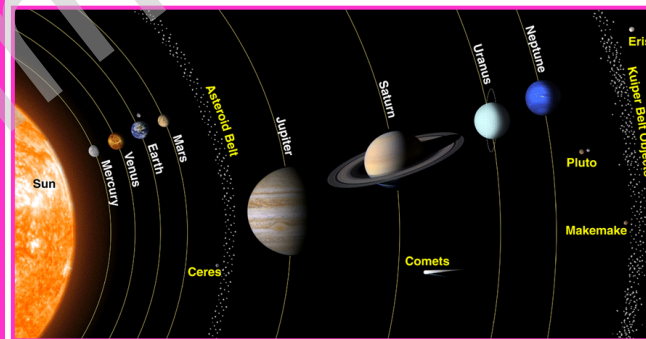
In the 100s BC, Hipparchus, the most important Greek astronomer of his time, calculated the comparative brightness of as many as 1,000 different stars. He also calculated the Moon's distance from the Earth.

### Galileo Galilei

(1564—1642) Galileo became famous for his work on maths and astronomy. He developed the telescope to enable close observation of the night sky and was famously imprisoned for his correct theory that the sun was at the centre of the universe. He also invented the compass and the thermometer. With his telescope, he was able to see that there were 4 moons around Jupiter, today we know there are at least 79 moons!



There are eight planets in our Solar System. The four nearest the sun are rock planets, the outer four planets are gas giants. They all orbit our sun which is a star. Each planet has at least one moon. These orbit their planets. Every planet takes a different number of days to orbit the sun. For the Earth, it is 365.25 days which is why we need a leap year every four years.



**Phases of the moon**— The moon itself doesn't emit any light like the sun. What we see when we see the moon, is sunlight reflected off the moon.

The phase of the moon is how much of the moon appears to us on Earth to be lit up by the sun. Half of the moon is always lit up by the sun, except during an eclipse, but we only see a portion that's lit up. This is the phase of the moon.

Around once per month, every 29.53 days to be exact, the phases of the moon make a complete cycle. As the moon circles the Earth, we can only see a portion of the lit up side. When we can see 100% of the lit up side, this is a full moon. When we can't see any of the lit up side, this is called a dark moon or new moon.

