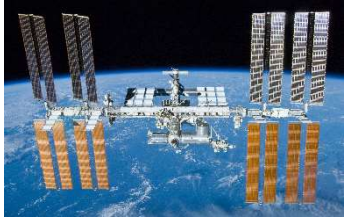


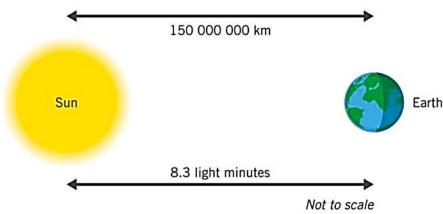
## Knowledge organiser – 7.2 Universe



The nearest objects you can see without a telescope are artificial satellites (e.g. ISS). The moon is a natural satellite.

### LIGHTS AND SPACE

- Most of the dots of light we see are stars in our galaxy.
- Some of the dots are other galaxies.
- Our nearest large galaxy (Andromeda) can be seen with a naked eye.
- Speed of light = 300 000 km/s
- Light-time is used to measure distance (not time) in space because distances are so big.

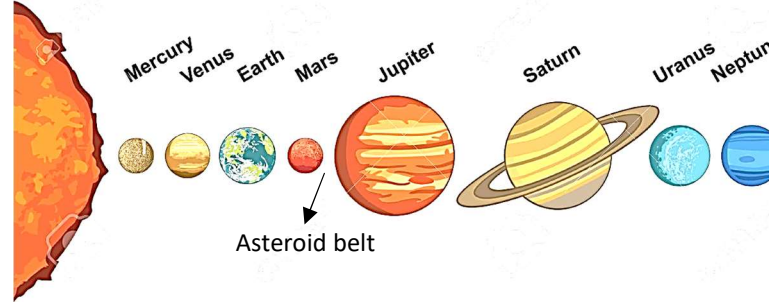


- We have day and night because Earth spins on its axis. It takes 24hrs to complete one full spin. The axis is tilted by 23.4°.
- The earth takes 365 ¼ days to orbit the Sun (one year).
- It is hotter in summer due to the tilt of the axis; the Sun's rays spread over a smaller area and the days are longer.

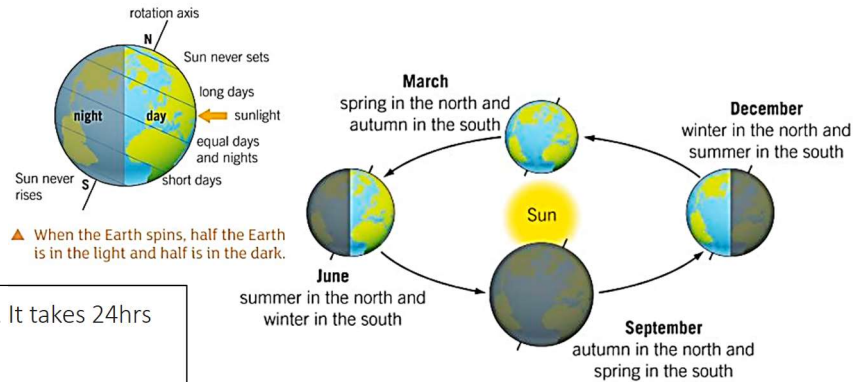
### MODELS OF THE UNIVERSE

Geocentric	Heliocentric
Earth did not move.	Planets orbit the Sun
<b>ARGUMENTS FOR:</b>	<b>EVIDENCE FOR</b>
☺ The ground did not seem to move	☺ Galileo used the telescope and observed moons in orbit around Jupiter, not the Earth.
☺ The Sun and Moon did appear to move	☺ Venus had phases, just like the Moon.
☺ The stars appeared to move	
<b>EVIDENCE AGAINST;</b> Sometimes the planets seemed to go backwards	These observations could be explained if both planets were orbiting the Sun. We use this model.

### OUR SOLAR SYSTEM



- Mercury, Venus, Mars, Jupiter and Saturn can be seen with the naked eye.
- The first four planets are called inner planets; they are made of rock. The conditions on these planets are very different.
- The four outer planets are called gas giants; made mainly of hydrogen and helium. They are very cold and much bigger than the inner planets.

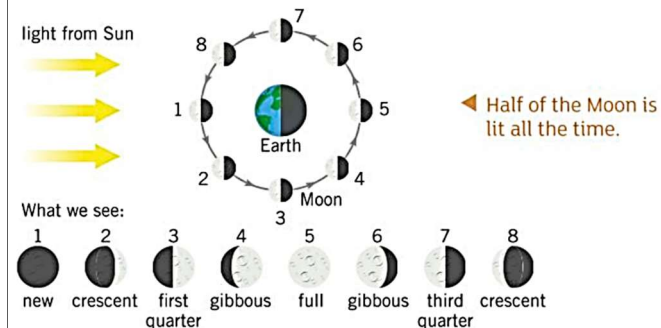


▲ When the Earth spins, half the Earth is in the light and half is in the dark.

▲ The Sun's light is spread out over a bigger area in the winter.

### Why does the Moon look different?

The Moon takes 27 days and 7 hours to orbit the Earth once.



KEYWORD	DEFINITION
<b>Artificial satellite</b>	A manmade spacecraft.
<b>Asteroid</b>	Lumps of rock orbiting the Sun left over from when the Solar System formed.
<b>Constellations</b>	A collection of stars that make a pattern in the sky.
<b>Exoplanet</b>	Planet that orbits a star outside our Solar System.
<b>Galaxy</b>	Collection of stars held together by gravity. Our galaxy is called the Milky Way.
<b>Geocentric model</b>	A model of the Solar System with the Earth at the centre.
<b>Heliocentric model</b>	A model of the Solar System with the Sun at the centre.
<b>Light year</b>	The distance light travels in a year (over 9 million, million kilometres).
<b>Milky Way</b>	The galaxy containing our Sun, Solar System and billions of other stars and planets.
<b>Moon</b>	A rocky body orbiting Earth, it is Earth's only natural satellite.
<b>Natural satellite</b>	A moon in orbit around a planet.
<b>Orbit</b>	Path taken by one object moving around another larger object, such as a satellite around the Earth. Earth completes one orbit of the Sun every year.
<b>Phases of the Moon</b>	Shape of the Moon as we see it from Earth because it reflects light from the Sun.
<b>Planet</b>	Any large body that orbits a star in the Solar System.
<b>Season</b>	Changes in the temperature during the year as the Earth moves around its orbit.
<b>Solar system</b>	The Sun and the planets and other bodies in orbit around it.
<b>Star</b>	Bodies that give out light and that may have a Solar System of planets.
<b>Sun</b>	The star at the centre of our Solar System.
<b>Universe</b>	Everything that exists.