

Year: 5

Term: Spring

EARTH AND SPACE

Prior knowledge

Explore the natural world around them. (Reception - Earth and space)
 Describe what they see, hear and feel whilst outside. (Reception - Earth and space)
 Observe changes across the four seasons. (Y1 - Seasonal changes)
 Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes)

Key knowledge (lessons)

The Earth and the Sun (approximately spherical bodies)

WARNING IT IS NOT SAFE TO EVER LOOK DIRECTLY AT THE SUN, EVEN WHEN WEARING SUN GLASSES.

What is the Sun?	The sun is a star at the centre of our solar system.
What is the solar system?	The solar system has eight planets; Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
How is the Earth related to the Sun?	The Earth orbits (goes around) the Sun. The Earth takes one year to orbit the Sun. The Earth is held in its orbit round the Sun by the Sun's gravitational pull.

The Moon and the Earth

What is a moon?	A moon is a celestial body that orbits a planet. The Earth has one moon; Jupiter has four large moons and numerous small ones.
How is the Moon related to the Earth?	The Moon orbits the Earth. It takes about 28 days for the Moon to orbit the Earth. The Moon is held in its orbit round the Earth by the Earth's gravitational pull.
Why does the Moon change shape?	IT DOESN'T. It appears to change shape because we cannot always see the side of the Moon that's in sunlight or we can only see part of the sunlit side of the Moon as it orbits Earth.

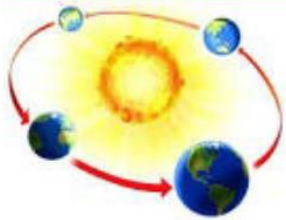
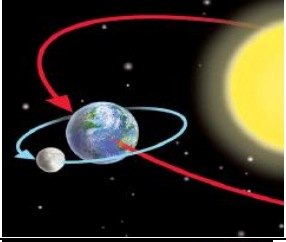
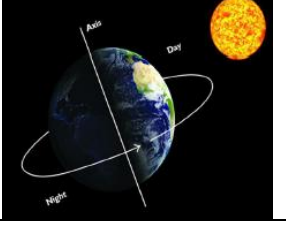
The rotation of the Earth

How else does the Earth move?	The Earth spins on its own axis. The Earth takes 24 hours (1 day) to completely rotate on its axis.
What causes day and night?	The Earth spins/rotates on its axis anti-clockwise once in a day. This makes it appear as the Sun moves through the sky but the Earth's rotation causes day and night. The side of the Earth facing the Sun is in daytime. The side of the Earth facing away from the Sun is in night time.
What causes Sunrise and Sunset?	The Sun doesn't move - it is us that moves. Because the Earth is rotating, the Sun appears to move across the sky as the day goes on. Different parts of the Earth experience daylight at different times – this means that it is morning, afternoon and night in different places.

Key Vocabulary	
Working scientifically vocabulary – prediction, measurement, enquiry, dependent variable, independent variable, fair test, similar, theory, hypothesis, line graph, relationship, outlier	
Axis	An imaginary line round which something rotates
Celestial	Relating to the sky or outer space
Gravitational	Moving towards a centre of gravity (a force which causes things to drop to the ground).
Lunar	All things to do with the moon.
Orbit	The curved path of an object around a star
Planet	A large, round object in spaces that moves around a star.
Rotating	Moving in a circle around an axis
Solar	Relating to the Sun
Star	A large ball of burning gas in space

Additional vocabulary to discuss across the unit – Earth, Sun, solar system, star, planet, moon, sphere, telescope, universe

Diagrams and symbols

	The Earth orbiting the Sun, which takes one year.
	The Moon orbiting the Earth, which takes about 28 days.
	The Earth spinning on its axis, which takes 24 hours.

Key skills

- ✓ Describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- ✓ Describe the movement of the Moon relative to the Earth
- ✓ Describe the Sun, Earth and Moon as approximately spherical bodies
- ✓ Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Future Learning

Gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only). (KS3)

Our Sun as a star, other stars in our galaxy, other galaxies. (KS3)

The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. (KS3)

The light year as a unit of astronomical distance. (KS3)

Deepening and broadening the knowledge and understanding for GDS learners:

- knows that the planets take a different amount of time to orbit the Sun
- knows that planets orbiting the Sun travel at different speeds
- knows how long it takes planets in the solar system to orbit the Sun (other than Earth)
- describes the conditions on the planets
- explains an eclipse – lunar or solar
- explains what a leap year is
- describes the Moon as Earth's natural satellite
- knows that although the Moon rotates on its own axis we only see one face of the Moon from Earth, because the Moon's rotational period is exactly the same as its orbital period
- knows about the phases of the Moon
- knows that planets other than Earth have moons, e.g. the four moons of Jupiter
- describes the Earth and the Moon as spheroid (almost spherical) whereas the Sun is very nearly a perfect sphere
- knows that although the Sun, Earth and Moon are all approximately spherical in shape, they are very different in size
- knows that the Sun, the Moon, the planets, and the stars all (appear to) rise in the east and set in the west because Earth spins toward the east, in an anticlockwise direction
- describes the difference between geocentric and heliocentric models of the solar system

Key Outcomes

1: What makes up our solar system?

Children will use measuring and scale to practically investigate the sun, moon and planets in the solar system in relation to each other including drawing scientific diagrams and drawing conclusions.

2: How do we have night and day?

Children will investigate the movements of the Earth and record results from shadow length investigation in line graphs and identify any patterns (e.g. sunrise gets earlier and earlier up to June and then it starts getting later; when sunrise gets earlier, sunset gets later so it is daylight longer)

3: What is an eclipse?

Children build on knowledge about light and shadows to predict what a solar and lunar eclipse are and investigate what happens during a solar eclipse on Earth in relation to the distance the sun is to the moon – e.g. measuring in cm and mm and graphing the collected data (e.g. in a line graph).

4: Does the moon change shape?

Children will use diagrams and models to explore and teach each other about the phases of the moon and how it causes tides through its gravitational pull.

5: Why do we have seasons?

Children predict the reason for seasons building on their knowledge of the Earth, sun and moon. Then, predict the season depending on the tilt of earth, explore and present their findings and conclusions e.g. using diagrams, tables, graphs, charts etc.

6: How do we know so much about space?

Children use secondary sources to research information about space (e.g. the ISS, Timothy Peake etc.) Research and compare past theories about space, identifying scientific evidence that has been used to support or refute ideas or arguments (e.g. geocentric vs. heliocentric models)