

Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: Science Year: Y5 - Earth and Space

NC/PoS:

- 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.

Prior Learning (what pupils already know and can do)

The movement of Earth in space gives us day and night and it takes the Earth a day to go around on its axis. In the UK (United Kingdom), the day length is longest in the summer and shortest in the winter. The moon goes around the Earth.

End Goals (what pupils MUST know and remember)

- Know that our solar system consists of our star, the Sun, and everything bound to it by gravity – the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune
- Know that dwarf planets such as Pluto; dozens of moons; and millions of asteroids, comets, and meteoroids are also within our solar system
- Know Mercury, Venus, Earth and Mars are terrestrial planets
- Know Jupiter and Saturn are giant gas planets and Uranus and Neptune are giant ice planets
- Know that the Earth is a sphere, spins on an axis as it travels round the sun, when one side faces the sun the other faces space
- Know that the side facing the sun is bathed in light and heat (daytime) and the side facing space is cooler and darker (night)
- Know that a day on Earth lasts 24 hours – how long it takes to orbit the sun
- Know that the Earth's tilt on its axis is what causes the 4 seasons. Sometimes it points towards the sun and other times it points away from the sun.
- Know that the moon moves around the Earth in an approximately circular orbit, once around the Earth in approximately 27.3 days
- Know that as the moon orbits the earth its position changes, relative to the stars.

Key Vocabulary: solstice, planets, revolve, sphere, solar system, spherical, terrestrial, Jovian, orbit, orbital path, axis, tilt, rotation, shadows, lunar month, lunar cycle, phases of the moon - full moon, gibbous moon, half-moon, crescent moon, new moon, waxing, waning

Session 1: Recap previous learning:

The movement of Earth in space gives us day and night and it takes the Earth a day to go around on its axis. In the UK (United Kingdom), the day length is longest in the summer and shortest in the winter. The moon goes around the Earth.

Suggested resources:

<https://www.youtube.com/watch?v=btcTfor-j-c> what is a solstice? National Geographic

<https://www.youtube.com/watch?v=UiAUG1HtWIM> summer vs winter solstice: side by side time lapse

Vocabulary: solstice

Session 2: Recap: When are the longest and shortest daylight hours? How long does it take for Earth to orbit the sun?

Children learn that the sun is a star at the centre of our solar system and the Earth is one of eight planets in the solar system. The Sun and the eight planets are all roughly

spherical and the order of planets from the sun is: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Suggested resources:

<https://www.youtube.com/watch?v=libKVRa01L8> Solar system National geographic (up to 2.57)

<https://www.youtube.com/watch?v=UzbnPX8Stnc> the Solar System to scale

Children use <http://solarsystem.nasa.gov/kids/index.cfm> for research on different planets

Millions of years ago, a group of balls of matter were created; the planets in our Solar System. The Sun accounts for 99% of the mass of the Solar System and its diameter is 109 times that of Earth's.

Rocky (terrestrial) planets: Mercury, Venus, Earth, Mars

Gas (Jovian) planets: Jupiter, Saturn, Uranus and Neptune which each have many moons. They are much bigger than the rocky planets and are balls of hydrogen and helium.

The Jovian planets are much larger planets compared to the rocky ones.

Vocabulary: planets, revolve, sphere, solar system, spherical, terrestrial, Jovian

Session 3: Recap: Order the planets from the Sun. Which planets are terrestrial or Jovian? What shape roughly are the planets?

Children learn the Earth and the other planets orbit the sun and the Sun is much bigger than the planets, so its gravitational pull is larger. The Earth takes about 1 year to orbit the sun.

Suggested resources:

<https://www.youtube.com/watch?v=IIY8Odoux1w> revolution time around the sun

Children research the orbits

Notes: The Solar System is disc-like in shape. The Sun is at the centre and the planets follow individual paths called orbits around it. They all travel in the same direction, but move at different speeds and take different times to complete one orbit. The fact that the Earth travels around the Sun has been accepted for less than 400 years

Vocabulary: orbit, orbital path

Session 4: Recap: how long does it take the Earth to orbit the sun? Which planet has the longest orbit? (Neptune as furthest from Sun) Which planet has the shortest orbit? (Mercury as closest to the Sun)

Children learn that the Earth spins on an axis as it travels round the sun and when one side faces the sun, the other faces space. They understand that the side facing the sun is bathed in light and heat (daytime) and the side facing space is cooler and darker (night)

Suggested resources:

<https://www.bbc.co.uk/bitesize/topics/zkbbkqt/articles/zn34r2p> Day and night

Vocabulary: axis, tilt

Session 5: Recap: How does the position of the Earth affect daylight hours?

Children learn to use the idea of the Earth's rotation to explain the apparent movement of the Sun across the sky.

Suggested resources:

The focus now is trying to enable the children to make a link between the direction and length of the shadows throughout the day with movement of the Earth on its axis. By placing a rounders pole on the playground throughout a sunny day the children can measure the length of the shadow every hour. They could also note down the compass direction of the shadow.

Vocabulary: rotation, shadows

Session 6: Recap: Why does it look like the sun is apparently moving across the sky?

Children learn it takes about 28 days for the moon to orbit the earth and that the moon appears to change shape.

Suggested resources:

<https://www.youtube.com/watch?v=1sj2otIjZfM> Phases of moon explained using an orrery

<https://www.youtube.com/watch?v=wz01pTvuMa0> Moon phases demonstration

Vocabulary: lunar month, lunar cycle, phases of the moon - new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, third quarter and waning crescent

Link to career:

Astronomer, physicist

https://pstt.org.uk/application/files/2816/4942/8557/Planetary_physicist_-_Dr_Sheila_Kanani.pdf

https://pstt.org.uk/application/files/5716/2851/6121/Astrophysicist_-_Vanessa_Emeka-Okafor.pdf

Scientists who have helped develop understanding in this field:

Aristarchus (310 – 230 B.C.). He was the first to figure out that the Earth travels around the Sun.

Nicolas Copernicus (1473 – 1543). Had the idea that Earth revolves on its axis and the Earth and other planets orbit around the Sun