



Medium Term Plan Space



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P levels

Performance attainment targets (P scales) and performance descriptors are used for pupils aged 5 to 16 with special educational needs (SEN) who are working below the standard of the national curriculum tests and assessments. PSTT recognises that the national curriculum levels used in this document are no longer current. We have had so many requests to return these materials to the website that they remain in the documents as a guide for those who have used them in the past. The written statements may be useful to others as an indication of children's development. For further information about P levels see:

<https://www.gov.uk/government/publications/p-scales-attainment-targets-for-pupils-with-sen>

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Primary Science Teaching Trust recommends that a full risk assessment is carried out before undertaking in the classroom any of the practical investigations contained in the plans.

Safety Note

PSTT advises teachers to refer to either CLEAPSS website or SSERC website for up to date health and safety information when planning practical activities for children.

Big Questions

- Is there life on other planets?
- Where is the Earth?
- Is the Earth really flat?
- Does the moon have seasons?
- What is a planet?
- What is in the solar system?
- Is the universe mainly empty?
- Should we explore space?
- Where did everything in the universe come from?
- Why don't Australians fall off the Earth?

Answers

- No life forms have yet been found on other planets but it is possible that it exists.
- The Earth is located in one of the spiral arms of the Milky Way, about 2/3 of the way out from the centre of the galaxy.
- The Earth is a spherical body.
- The moon has no seasons because some areas are always lit by sunlight and others are perpetually in shadow.
- In 2006 scientists agreed that a planet must do three things: 1) to orbit around the sun, 2) it must be big enough to have enough gravity to force it into a spherical shape, 3) it must be big enough that its gravity cleared away any other objects of a similar size near its orbit around the Sun.
- The solar system is made up of the Sun and everything that orbits around it including planets (some with moons), asteroids, comets and meteoroids.
- The Universe contains billions of galaxies, each containing millions/billions of stars. The space between the stars and galaxies is largely empty.
- Arguments in favour of space exploration: the human population is increasing, global warming, rising sea levels, pollution. Arguments against: expensive, dangerous, world hunger.
- Scientists believe the Universe began in a Big Bang, which took place nearly 14 billion years ago.
- When you are standing on the Earth (anywhere), the Earth is pulling you towards its centre which keeps you on the ground. This force is called gravity.

Learning Objectives

Pupils will have opportunities:

- To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.
- Develop an understanding of planets and our solar system.
- To investigate rockets and man's exploration of space

Quick review activities

- Look at a globe and what the different colours and shapes mean
- Listen to They Might Be Giants – Space suit <http://www.youtube.com/watch?v=HhQkuc5mJyo>
- Listen to They Might Be Giants – Shooting star
<http://www.youtube.com/watch?v=JqBChyNyLhU&list=PL44C7ADBD6A22FF0B&index=10>
- Listen to They Might Be Giants – How many planets?
<http://www.youtube.com/watch?v=XI5nBUidKgo&list=PL44C7ADBD6A22FF0B&index=13>

Vocabulary relevant to this topic

- Orbit – path of planet round sun
- Sun – star round which the Earth orbits
- Earth – planet we live on
- Moon – body that orbits a planet
- Planet – body that orbits a star
- solar system – the Sun and all planets (and asteroids) that move round it
- Universe – whole of space and everything it contains

- Day, night, sphere, revolve, spin, hot, cold, seasons

Background information about this topic

- Our Solar System is made up of a group of planets, moons, and other bodies that orbit the Sun: Other bodies include comets and asteroids. The Solar System is divided into two main sections – inner and outer Solar System. The inner Solar System contains four rocky planets, Mercury, Venus, Earth, and Mars. Many have craters, ridges, and volcanoes. The outer Solar System contains the four gas giants of Jupiter, Saturn, Uranus, and Neptune, which are large planets made mostly of gases and all of which have ‘rings’ although Saturn’s are the most pronounced. Planets are held in position by gravity.
- The **Sun** is a body of hot gases that provides light and heat for living things to survive. The centre of the Sun is about fifteen million degrees Celsius. The diameter of the Sun is about 1.4 million kilometres and about 109 Earths could fit across it. Despite its large size, the Sun is actually a medium-sized star. There are many stars that are significantly larger. Even though the Sun is millions of miles away from Earth, it is the closest star to our planet.
- **Mercury** is the planet closest to the Sun and not much bigger than our Moon. It rotates slowly; taking about 6 months to rotate once, so one Mercury day is half a year. It also takes nearly eighty-eight Earth days to complete orbit around the Sun so a Mercury year is just 3 months long. The side of Mercury that faces the Sun is extremely hot, while the side facing away is extremely cold. Temperatures on the planet can range from -183 degrees Celsius to 427 degrees Celsius. It has no moons or atmosphere and is covered with craters.
- **Venus** is the second planet from the Sun and is a similar size to Earth. The atmosphere is made of thick carbon dioxide gas which traps in heat, much like the greenhouse effect. Venus is the hottest of all the planets with surface temperatures reaching of almost 500 degrees Celsius. It also rotates backwards possibly because an asteroid collided with it long ago and disturbed its rotation. Venus has a 4 month long ‘day’ and a ‘year’ of 7 months.
- **Earth** is the only planet where scientists have found life so far. It is known as the "blue planet" due to the presence of water which covers about 70% of its surface. It is about 149,600,000 km from Sun with a diameter of 12,756 km.

- **Mars** is known as the "red planet" due to the reddish colour of its rocks. It is about half the size of Earth with same day length as Earth although it takes 2 years to go round the Sun. It has 2 satellites or moons. For years, scientists believed the planet was once covered by liquid water, and in July of 2008, ice was discovered by the Phoenix Mars Lander
- **Jupiter** is the largest of all the planets – 11 times the size of Earth and it is made mostly of hydrogen. A 'day' is 10 hours and it takes 12 years to orbit the Sun. Scientists have discovered over sixty moons that orbit the planet and there is also a faint ring that circles the planet. There is a permanent storm on the planet called the Great Red Spot which scientists believe that this storm has lasted well over three hundred years.
- **Saturn** is the second largest planet - 9 times the size of Earth and it is most recognisable by its rings, which are made of ice, rocks, and dust. Like Jupiter, Saturn is composed mostly of hydrogen. There are sixty known moons that orbit Saturn and one of them, Rhea, may have rings. This would be the first discovery of a moon that has a ring system. A 'day' is 10.6 hours and it takes 29 years to go round the Sun
- **Uranus** and **Neptune** are sometimes considered "ice giants" because their composition differs from Jupiter and Saturn. While the atmospheres of both Uranus and Neptune are mainly hydrogen and helium, there is also the presence of ice and frozen volatile gases such as ammonia and methane. Uranus is the coldest planet in our Solar System, with temperatures reaching -224 degrees Celsius. Uranus also has a faint ring system. The most notable feature of Uranus is its axis of rotation. While most planets spin like a top, Uranus spins on its side, a bit like a rolling ball. Therefore, the poles of Uranus are located where most planets have their equators. It is possible that a planet may have knocked Uranus off its axis soon after it was formed. Uranus has a 16 hour 'day' and takes 84 years to go round the Sun.
- **Neptune** is the farthest planet from the Sun, and is similar in size and composition to Uranus. Neptune's striking blue colour is most likely from the presence of methane in its atmosphere. Like Jupiter, Neptune has a permanent storm, called the Great Dark Spot. Neptune also has a ring system which is composed mostly of ice. Neptune a 17 hour 'day' and takes 164 years to go round the Sun.

- For decades, **Pluto** was considered the ninth planet of our Solar System. However in 2006, astronomers revised their definition of a planet and decided that Pluto is actually a dwarf planet, or minor planet. It has a 'day' length of 7 days and takes 247 years to orbit the Sun.
- Clusters of stars form galaxies and our Sun is part of a galaxy called the **Milky Way** which is estimated to contain up to 400 billion stars. Comets move round the Sun in elongated orbits and this can take many years e.g. Halley's comet comes close to Earth every 76 years. The centre of a comet is made of dust and ice and only has a tail when it comes close to the Sun because some of the frozen gases on its surface turn to vapour.
- Only the side of the Earth that faces the Sun is light but because the Earth completes a rotation every 24 hours every part of the world gets some sunlight although in our summer the North Pole has 24 hours of day and then is winter 24 hours of darkness. The moon takes about 28 days to orbit the Earth but it goes from one full moon to the next in 29 ½ days. 12 lunar months is 354 days which is close to a year which gave rise to dividing the year into 12 months, although months are not all the same length. Seasons happen because of the tilt of the Earth and not as a result of distance from the Sun. In fact the Earth is closer to the Sun in northern winter. The Earth spins round an imaginary line - the axis - which is slightly tilted with respect to the path the Earth takes as it orbits the Sun. When the Earth is on one side of the Sun the northern half is tilted towards the Sun and the southern half tilted away, so the northern half gets extra sunshine. The tilt also alters the area over which the sunlight is spread so in summer there is more sunlight per unit area and in winter the same amount of sunlight is spread over a much larger area. Generally the parts of the Earth closer to the poles experience more extreme seasonal changes than parts close to the equator. The mildness of British winters is due to the Gulf Stream which is a current of warm water from the Caribbean.

Space P1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Descriptions of intended outcomes at different levels of attainment

- Tolerates being involved in an activity eg. touching toast (P1i)
- Shows random fleeting response to activity eg. responds to the sensory stimuli by reaching out to engage with an object (P1ii)
- Shows in interest in aspects of day and night or seasons (P2i)
- Perform action by trial and error e.g. cleaning teeth (P2ii)
- Remembers some learned response for longer e.g. intentionally revisits an experience like touching the glow dough and rocks (P3i)
- Initiates interactions and activities e.g. putting on a piece of clothing or making star biscuits (P3ii)

Possible Activities:	Resources:
<p>Day and Night :</p> <p>Pupils to experience a sensory day eg. use a black sheet or blanket to cover the pupil to represent darkness/night-time. Alternatively darken a room.</p> <p>Use an alarm clock (possibly switch operated) to represent ‘time to get up’ and then remove the blanket or lighten the room for daytime.</p> <p>Continue with a variety of daytime activities eg. wash hands and face, have toast and a drink for breakfast, getting on a bus to school etc.</p> <p>Finish with ideas for the night-time routine. E.g. cleaning teeth,</p>	<p>Black sheet or blanket, darkened room, torch, sensory room, alarm clock</p>

Space P1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Optional activities you might like to try include:	Resources:
<p>Play Starry, Starry night or Twinkle Twinkle Little star whilst in darkened room with Glow stars stuck all around.</p> <p>Make star and moon shapes from clay or biscuit dough.</p>	<p>Copy of Starry, Starry night by Don McClean, darkened room, glow stars, clay, biscuit dough, star cutters, yellow paint or icing,</p>
<p>Make a space sensory container using glow dough, moon dough and glowing rocks and stars.</p> <p>Make a night picture using a dark blue background and sticking on silver or foil stars and a silver moon.</p>	

Space P1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Seasons : Read sensory stories linked to seasons eg. “The Scarecrow that wouldn’t scare” or adapt the poem “The Months” by Sara Coleridge for a monthly sensual experience.</p>	<p>“The Scarecrow that wouldn’t scare” by “The Months” by Sara Coleridge Chosen sensory resources eg. shaving foam, fans, ice lollies and acorns etc.</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Explore clothing for four different seasons by trying them on</p>	<p>Hat / scarf, sunglasses swimming costume, raincoat and wellies etc.</p>
<p>Explore some seasonal aspects e.g. make a ‘nest’ for hibernation – one pupils can get into-, listen to spring bird song, rustle dried leaves,</p>	

Points to Note:

http://www.youtube.com/watch?v=NU9RO_v52e4

for Spring bird song recordings

Space P1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Play songs associated with the seasons</p> <p>Begin to match objects and images associated with each season.</p>	<p>Songs as appropriate, range of objects or photos of objects e.g. ice cream, bucket and spade, sledge, fireworks, daffodils, Easter eggs, Xmas tree</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Read the Big book: 'Whatever the Weather' by Wendy Body.</p> <p>Match clothing to different seasons.</p>	<p>Shorts, scarves, coats, gloves, thick socks, think t shirts etc</p>
<p>Match different animals to their seasonal activity, e.g. birds and migration, hedgehogs and hibernation</p> <p>https://www.bbc.com/bitesize/clips/z7kc87h</p> <p>Mime along to this song</p> <p>http://learnenglishkids.britishcouncil.org/en/songs/the-leaves-the-tree</p> <p>Show The Lazy Bear animation about a bear waking up in the wrong season</p> <p>http://learnenglishkids.britishcouncil.org/en/short-stories/the-lazy-bear</p>	

Points to Note:

Short winter days and long summer days are often not noticed so will need to be identified and appreciated.

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Seasons : Set up four tables with objects and images linked to each season, so that the pupils can begin to identify which ones are associated with each season. Play the Four Seasons by Vivaldi at the same time.</p>	<p>Seasonal objects e.g. Easter eggs, dead leaves, pictures of snowmen, trees in different seasons, Xmas decorations, clothes etc</p>
<p>Optional activities you might like to try include:</p> <p>Create a display with pictures, resources connected with the different seasons. Or make a four seasons mobile.</p> <p>Show videos of hibernation and link seasonal animal activities to key words and give a simple explanation eg. bird – migration/ fly away – too cold and not enough food.</p> <p>Listen to the song about Why do we have the seasons?</p> <p>Look at the different seasons on the Earth eg. when we have Summer, Australia is having their winter.</p>	<p>Resources:</p> <p>Pictures relating to seasons , metal coat hangers, string, scissors, seasonal activity cards</p>

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Points to Note:

The moon 'reflects' light at night not 'emits' light.

The sun stays still and the Earth moves (orbits) around it.

Some seasonal activity cards could be:

Hedgehog – hibernate- no food

Butterfly – come inside houses and sheds- safe from bad weather

Mice- dig burrows – feed on plant roots deep in ground

Frogs – slow right down-use body fat up slowly

Spiders –leave eggs in fluffy nest- hatch in spring

Bumble bees – make antifreeze –keeps them safe in cold

Squirrels – get extra fur – keeps warmer in cold

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Possible Activities:	Resources:
<p>Seasons :</p> <p>Watch the video clip http://www.bbc.co.uk/learningzone/clips/the-earths-orbit-around-the-sun/1592.html that links the tilt of the Earth to the sun and the season .</p> <p>Make a poster/ display for the seasons showing the tilt of the Earth and its position in orbit throughout the year.</p>	

Optional activities you might like to try include:	Resources:
<p>Create a 'TV program' by videoing a role play of the Earth moving around the sun and how the seasons occur at different phases.</p>	
<p>Look at the tilt of the Earth and the effect this has on the seasons around the world. Pupils set up the experiment to show how the angle of the sun causes the seasons.</p>	

Points to Note:

Some of the diagrams showing the Earth's orbit and seasons are misleading because they show the Earth nearer the Sun in Spring and Autumn.

Objective 2: Develop an understanding of planets and our solar system.

Descriptions of intended outcomes at different levels of attainment

- Encounters a range of sensory evidence e.g. colours of planets (P1i)
- Shows random fleeting response to activities (P1ii)
- Shows interest in aspects of the planets (P2i)
- Shows consistent or differentiated response to exploring different planets (P2ii)
- Observes results of own actions e.g. dropping sponges to make solar system (P3i)
- Actively explores aspects of the planets for more extended periods (P3ii)

Possible Activities:	Resources:
<p>Play “The Planets” by Gustav Holst whilst displaying pictures of planets from our Solar System on the IWB.</p> <p>Make each pupil a specific planet using props depending on your level of creativity eg. green fabric for the Earth, silver foil blanket for the moon suitably coloured shiny fabric for the sun.</p> <p>Each ‘planet’ can ‘orbit’ the sun with the music.</p>	<p>IWB</p> <p>“The Planets” music by Gustav Holst, different coloured fabrics</p>
Optional activities you might like to try include:	Resources:
<p>Sensory story involving a journey into space and exploring properties of the different planets encountered, e.g. Mercury –rocky, Venus hot, Earth water, Mars red soil Neptune cold, Saturn hoops, Jupiter –fast spinning Uranus – lying on side</p>	<p>Rocks, hot pack, cold pack, water, red soil. Hoops</p>

Objective 2: Develop an understanding of planets and our solar system.

Support pupils to make a 'Splat' solar system using different colour paints for each planet. Pour paint into the bowls and soak the sponges or cotton wool and drop from a fair height onto the paper. Name each planet whilst performing Space Splat.

Points to Note:

Suggestions for planet colours:

Grey-Mercury

Green –Earth

Gold –sun

Red –Mars

Cream – Venus

Orange – Jupiter

Light blue – Uranus

Pale yellow – Saturn

Blue – Neptune (bit darker than Uranus)

Foil - moon

Space P1-3

Objective 3: To investigate rockets and man's exploration of space

Descriptions of intended outcomes at different levels of attainment

- Tolerates being involved in an activity (P1i)
- Shows intermittent reactions to activity (P1ii)
- Begins to show interest in the activities (P2i)
- Begins to be proactive in their interactions e.g. turns to the space objects when shown them (P2ii)
- Becomes aware of the source of sensory evidence (P3i)
- Actively explores the objects for longer (P3ii)

Objective 3: To investigate rockets and man's exploration of space

Possible Activities:	Resources:
<p>Play space-theme music.</p> <p>Pupils role-play/talk about what they think it might be like travelling to the moon.</p>	<p>Music eg. Holst's 'Planets' or 'Fly me to the Moon'</p> <p>Foil, blanket</p> <p>Plaster of Paris moon surface, space food, space sand</p>
Optional activities you might like to try include:	Resources:
<p>Sensory Story: 'Toast in the Machine' by Vocal Image: www.vocalimage.co.uk</p> <p>Experience tasting Astronaut food</p>	<p>Astronaut food e.g. ice cream, dried strawberries, food sticks</p>
<p>Sensory story with props: 'Zoom, Rocket, Zoom!' by Margaret Mayo.</p> <p>Make a sensory Space box http://shareandremember.blogspot.co.uk/2011/07/space-sensorydiscovery-box.html</p>	

Points to Note:

A variety of Astronaut food can be purchased on line. Some pupils may have allergies

Space P4-6

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Descriptions of intended outcomes at different levels of attainment

- Imitates actions eg. role play for day and night activities (P4i)
- Explores using vocalisation (P4ii)
- Begins to initiate an interaction and cooperate with turn taking (P5i)
- Responds to and follows instructions involving more than one step (P5ii)
- Recalls the stages in a process as it is carried out (P6i)
- Begins to make very general prediction based on everyday experience e.g. which piece of clothing to wear in winter (P6ii)

Possible Activities:	Resources:
<p>Day and Night :</p> <p>Pupils to explore day and night activities eg. choose a black sheet/blanket to cover themselves to represent night-time or a torch/lamp to represent day-time.</p> <p>Have a selection of daytime and night-time activities or objects of reference to act out day activities eg. alarm clock, breakfast, dressing, shopping and swimming for daytime or book, pyjamas and blanket or pillow for night-time.</p>	<p>Black sheet or blanket, darkened room, torch, sensory room, alarm clock</p>

Space P4-6

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Optional activities you might like to try include:	Resources:
<p>Anticipate and begin to sort hot and cold ('day and night) materials</p> <p>Play dominoes or snap of day and night objects such as moon – different shapes, stars, sun, clouds – day and night etc</p>	<p>Day and night materials such as ice, hot water bottle, frozen peas hot packs, cold and hot foods and drinks, Dominoes or snap cards.</p>
<p>Learn about and sort daytime and nocturnal animals</p> <p>https://www.bbc.com/bitesize/clips/z4qd7ty</p>	

Points to Note:

Early ideas about day and night are linked to need – we need to sleep and we can rest at night.

Pupils may think that the sun swaps with the moon and goes somewhere else or that the sun gets covered.

Use a bright torch or a sensory room to experience light.

Health & Safety:

Stress pupils should not look directly at the sun.

Use simple images to make snap cards or domino sets.

Space P4-6

Objective 2: Develop an understanding of planets and our solar system.

Descriptions of intended outcomes at different levels of attainment

- Imitates actions eg. moving in a circular direction around the 'sun' (P4i)
- Makes simple choice about which material to use to make their planet (P4ii)
- Responds to simple scientific questions e.g. which planet is red? (P5i)
- Anticipates activities and events e.g. when making splat solar system or reading sensory story (P5ii)
- Responds to simple scientific questions that require a more detailed response than P5 e.g. Can you find the planets nearest Earth? (P6i)

Possible Activities:	Resources:
<p>Pupils can make sensory planets depending on the planets characteristics.</p> <p>Carrying their planet the pupils should move (orbit) the sun. Pupils should verbalise the name of their planet or use a switch.</p>	<p>Play dough in different colours, push lights painted different colours for the planets, felt, rice, cotton wool, pipe cleaners, glitter</p>

Objective 2: Develop an understanding of planets and our solar system.

Optional activities you might like to try include:	Resources:
<p>Pupils to work together to make a ‘Splat’ solar system using different colour paints for each planet. Pour paint into the bowls and soak the sponges or cotton wool and drop from a fair height onto the paper. Name each planet whilst performing Space Splat.</p>	<p>Gloves Paints Bowls Large sheet of black or white paper Protective sheet Sponges/cotton Wool</p>
<p>Sensory story about a journey through space. Pupils to identify objects to be found there e.g. moon, stars, sun, planets and return to planet ‘Earth’ at the end of the lesson</p>	

Points to Note:

Many pupils think the moon only comes out at night

Suggested planet colours

Grey-Mercury

Green –Earth

Gold –sun

Red –Mars

Cream – Venus

Orange – Jupiter

Light blue – Uranus

Pale yellow – Saturn

Blue – Neptune (bit darker than Uranus)

Objective 3: To investigate rockets and man’s exploration of space

Descriptions of intended outcomes at different levels of attainment

- Imitates actions on space journey (P4i)
- Communicates awareness of obvious changes (P4ii)
- Responds to simple scientific questions.g. Show me what the rocket did (P5i)
- Indicates the before and after changes of rocket models (P5ii)
- Recalls the simple stages in launching the different rockets (P6i)
- Begins to make connections e.g. expecting the rocket to shoot upwards (P6ii)

Possible Activities:	Resources:
<p>Go on a space journey, take off, orbit the earth, land, First words -'A small step for man, a giant leap for mankind', collect rock samples, return to earth, pass through the atmosphere, splash down, Salute from US president.</p> <p>Use clip below for rocket launch http://www.youtube.com/watch?v=KfYto9Szei8</p> <p>Demonstrate a water powered rocket being launched</p>	<p>Spacesuits/ overalls, helmets/ paper mache, gloves, goggles, space food/ dehydrated foods, flags, switches. Water rocket kit</p>

Objective 3: To investigate rockets and man's exploration of space

Optional activities you might like to try include:	Resources:
<p>Explore air pressure or 'stomp rockets'.</p> <p>Explore balloon rockets (long balloon attached to a straw on a taut string flight path)</p>	<p>Stomp rockets, balloons, string, paper, sellotape</p>
<p>Match obvious space and Earth objects such as rocket, moon, tree, house, people, astronaut, planet, space buggy.</p> <p>Help pupils make baking powder and vinegar rockets http://www.wikihow.com/Make-a-Baking-Soda-and-Vinegar-Rocket Or foam rockets http://www.jpl.nasa.gov/education/videos/playVideo.cfm?videoID=29</p>	

Points to Note:

Ref CLEAPSS website for launching rockets in classrooms.

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Descriptions of intended outcomes at different levels of attainment

- Identifies features of day and night (P7i)
- Sorts materials and objects with help (P7ii)
- Begins to ask some of their own questions e.g. why does it go cold at night? (P8i)
- Explores and observes differences and changes (P8ii)

Possible Activities:	Resources:
<p>Day and Night: Reinforce that the 'Sun' gives us 'light' and 'heat' in the daytime. To show the sun gives out heat make a pizza box oven http://kitchenpantryscientist.com/?p=313 To show the sun gives out light show a video of a solar eclipse. http://www.youtube.com/watch?v=2IHb5ruGUyw OR http://www.youtube.com/watch?v=IM1E9O4Iz8I</p> <p>Name basic day and night time activities either verbally or with symbols. Then sort the activities into their appropriate groups.</p>	<p>Cards / photos showing different activities. Pizza boxes, foil, newspaper, sellotape, black paper, dowel or stick to prop lid open, part cooked food to finish cooking in oven or chocolate.</p>

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Optional activities you might like to try include:	Resources:
<p>Show videos of the earth taken from Apollo space craft and ask where pupils think this is taken from? What is lighting up the Earth? What else could the sun light up?</p> <p>Mark the position of the sun during the day on a window.</p>	<p>Cut out pictures of Sun to stick onto window during day, blu tack or similar</p>
<p>Link the temperature difference between day and night. Set up a data logger to take the temperature in school over the weekend.</p> <p>Demonstrate the experiment to show how the angle of the sun causes the seasons http://www.ducksters.com/science/experiment_sun_angle_seasons.php</p>	

Points to Note:

Children sometimes think night is caused when the Sun goes behind a cloud and that night is caused by the Sun orbiting the Earth.

Safety: do not let pupils look directly at the Sun.

There are a number of videos on youtube showing pictures of Earth from space e.g.

<http://www.youtube.com/watch?v=csNcVSvVC8M>

Objective 2: Develop an understanding of planets and our solar system.

Descriptions of intended outcomes at different levels of attainment

- Looks through simple media to locate information e.g. finding out about a planet (P7i)
- Communicates simple observations (P7ii)
- Begins to arrange planets in order (P8i)
- Identifies features of the different planets (P8ii)

Possible Activities:	Resources:
<p>Pupils to build on their knowledge of the properties of the planets including their size and position in the Solar System to make their own paper mache planets.</p> <p>When their planets are completed the pupils to describe/ indicate some of the properties .</p> <p>Watch the orbit of planets around the sun (there are lots of film clips on YouTube) before going to a large space or playground to align the pupils in the correct orientation to the sun.</p>	<p>Balloons, paper paste (fungicide free) brushes, paints.</p>

Objective 2: Develop an understanding of planets and our solar system.

Optional activities you might like to try include:	Resources:
<p>Observe how moon changes shape http://www.primaryhomeworkhelp.co.uk/moon/#aut1 http://www.bbc.co.uk/learningzone/clips/the-moon-and-its-orbit-around-the-earth/1596.html and record them over the course of a month.</p> <p>Make a 'flick book' of the phases of the moon.</p> <p>Make a moon surface using Plaster of Paris in a tray and dropping in stones wrapped in foil from different heights.</p>	<p>Plaster of Paris, tray, stones, foil , recording sheet for phases of moon</p>
<p>Talk about stars, constellations and myths using resource such as:</p> <p>http://www.bbc.co.uk/learningzone/clips/the-sun-and-the-stars/13291.html http://www.rmg.co.uk/stories-of-the-skies/</p>	

Points to Note:

The moon is often thought of as a crescent shape but this is only because we are unable to see the whole moon at all times of the month.

Ref CLEAPSS website for guidance on safe use of Plaster of Paris.

Objective 3: To investigate rockets and man’s exploration of space

Descriptions of intended outcomes at different levels of attainment

- Indicates the best result e.g. which rocket went highest (P7i)
- Makes a pictorial representation of the results (P7ii)
- Identifies features of the Earth from space (P8i)
- Contributes to planning an investigation (P8ii)

Possible Activities:	Resources:
<p>What does earth look like from space? Look at images and then create a globe as seen from space such as blue for the sea, green land, white clouds.</p> <p>Sequence a journey to space and back using pictures /symbols.</p> <p>Explore artefacts to do with space travel e.g. compare tastes and texture space food with fresh versions e.g. finding out if space blankets keep you warm e.g. how to put on a space suit.</p> <p>http://www.youtube.com/watch?v=VsdoJy8rzZg</p>	<p>Ball for earth, paints, fabric, paper, cotton wool</p>

Objective 3: To investigate rockets and man's exploration of space

Optional activities you might like to try include:	Resources:
<p>Investigate the effect of air pressure on 'stomp rockets' e.g by varying the size of stomp).</p> <p>Investigate balloon rockets (long balloon attached to a straw on a taut string flight path), e.g. fully or semi pumped up balloon or different sizes of balloon.</p>	<p>Stomp rocket, balloons, string, sellotape, paper</p>
<p>After looking at take off rocket video, http://www.youtube.com/watch?v=FzCsDVfPQgk Discuss the design of the rocket; create their own rocket using junk modelling or ideas from these websites. http://www.ehow.co.uk/list_6516211_science-activities-kids_-rockets.html http://www.bbc.co.uk/norfolk/kids/astronomy/rocket/astronomy_for_kids_rocket.shtml</p> <p>Discuss with pupils what things they want to find out about life in space e.g. how do astronauts go to the toilet? https://www.theguardian.com/science/video/2016/jan/20/tim-peake-explains-how-astronauts-go-to-the-toilet-in-space-video Make these into a mobile and then use simple resources to try to find answers which are attached to mobile.</p>	

Space L1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Descriptions of intended outcomes at different levels of attainment

- Asks simple questions stimulated by their exploration of day, night and seasons (L1i)
- Demonstrates events using resources (L1ii)
- Shows an understanding of comparative language e.g. more, less, much, a little bit (L1iii)
- Describes simply how day and night occur (L2i)
- Draws on their observations and ideas to offer answers to questions (L2ii)
- Records events in drawings that can be recognised (L2iii)
- Explains how day and night occur (L3i)
- Uses scientific language e.g. in posters or TV programme (L3ii)
- Represents things in the real world using physical models e.g. globe and light to show day and night (L3iii)

Space L1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Possible Activities:	Resources:
<p>Day and Night: Get pupils to sit on a revolving chair in a dark room and shine a torch onto them. Slowly revolve the chair and ask them to describe what they see. Can they use this to explain day and night?</p> <p>Use a reflective surface to represent the moon and shine the torch on it so that the light reflects back to the Earth to show that the moon light is reflected sunlight. Look outside to see if they can see the moon – is it still visible during the day?</p> <p>Sit pupils on a revolving chair in a darkened room and hold a moon (polystyrene ball on a stick) in front of them and watch how shape of moon changes as chair is slowly turned round and the amount of shadow changes. If the moon is held lower the pupil's head get in way and this is like a lunar eclipse.</p>	<p>Revolving chair, bright light or torch, card, polystyrene ball on stick to represent the moon.</p>
Optional activities you might like to try include:	Resources:
<p>Show animation of day and night http://www.ictgames.com/dayNight/ Role play the Earth moving around the sun: Pupils to video and to make a 'TV program' of how day and night occur.</p>	<p>Globe, balls, torches, video cameras,</p>
<p>Talk about time of day in other parts of the world. Make a card clock and place under globe to it is midday in UK and then use it to find time in other countries. Check on the internet</p> <p>Look at the length of day and night on other planets and create a display</p>	

Space L1-3

Objective 1: To explore evidence that helps us to explain familiar phenomena such as day and night, seasons.

Points to Note:

Card clock is made by drawing two concentric circles on card and dividing into 24 equal parts- the hours of a day. This needs to be bigger than the base of the globe.

Objective 2: Develop an understanding of planets and our solar system.

Descriptions of intended outcomes at different levels of attainment

- Records about the planets in pre-drawn tables (L1i)
- Shares own ideas and listens to the ideas of others (L1ii)
- Recognises the basic features of planets in the solar system (L1iii)
- Presents evidence in an ordered way (L2i)
- Makes comparisons between the basic features of different planets (L2ii)
- Links some features of planets e.g. distance from sun to temperature (L2iii)
- Explains what the solar system is (L3i)
- Constructs a table to record features of planets using correct headings (L3ii)
- Presents data from table in bar chart format (L3iii)

Possible Activities:	Resources:
<p>Pupils to discuss and explain their knowledge of the planets and the Solar system and or use some secondary sources to find out about planets.</p> <p>Pupils to use an inflatable solar system to demonstrate the planets in their correct orientation to the sun: maybe devise a mnemonic .</p> <p>Make model planets using different objects to help give an idea of their relative sizes.</p>	<p>Secondary sources about solar system: Inflatable solar systems, film clips/ models (Internet has lots)</p>

Objective 2: Develop an understanding of planets and our solar system.

Optional activities you might like to try include:	Resources:
<p>Find out about relative features of the planets and record in a table e.g. size, temperature, length of day, number of moons and talk about what it might be like to live there! Pupils could then make a 'Holiday Brochure' for one of the different planets</p>	<p>Secondary sources about planets: prepared table for some pupils</p>
<p>Create a video of a journey through the solar system and what they will encounter along the way, e.g. stars, milkyway, spacecraft etc.</p> <p>Talk about how stars can be used to navigate. http://www.youtube.com/watch?v=snTZYKjBNPs</p> <p>Visit the web cameras at ESO sites allowing anyone to see telescopes in action. https://www.eso.org/public/outreach/webcams/</p> <p>Visit the Greenwich Observatory, Space Centre or other local observatory or have a portable planetarium in school.</p>	

Space L1-3

Objective 3: To investigate rockets and man's exploration of space

Descriptions of intended outcomes at different levels of attainment

- Recognises scientific and technological developments that help us (L1i)
- Shares own ideas and listens to others when discussing life in space (L1ii)
- Asks simple questions stimulated by their exploration of space (L1iii)
- Records information onto a poster/ timeline (L2i)
- Draws on their observations and ideas to offer answers to questions about space (L2ii)
- Makes comparisons between life on earth and on a space station (L2iii)
- Explains whether space developments have been helpful or not (L3i)
- Uses scientific language when reporting on what they find out or think (L3ii)
- Links the design of a space station to life processes (L3iii)

Objective 3: To investigate rockets and man's exploration of space

<p>Possible Activities:</p>	<p>Resources:</p>
<p>Video clips from You-tube about life on a space station. http://www.youtube.com/watch?v=tgRMAVoHRbk</p> <p>Briefly study and outline the history of space travel e.g. through creating a poster or timeline. http://www.spacekids.co.uk/spacehistory/</p> <p>Design and create a 'space station', discuss what is needed to survive for a period of time in space e.g. water, food, oxygen and the effects of having no gravity in space.</p> <p>If appropriate build model ISS https://blog.doublehelix.csiro.au/build-your-own-international-space-station/</p>	<p>Resources on the history of space travel and space stations</p>
<p>Optional activities you might like to try include:</p>	<p>Resources:</p>
<p>Discuss differences between living in space and on Earth e.g. food, entertainment, washing, exercise, gravity, etc. and use activities from http://iss.jaxa.jp/kids/en/life/index.html</p> <p>Try to create 'space' food by drying fresh food and seeing how long it lasts for.</p>	<p>Ice cream, fruit, vegetables milk, oven or radiator, string to suspend slice of fruit and veg</p>

Objective 3: To investigate rockets and man's exploration of space

Discuss if you think there are other forms of life in space. What might they look like and how may they and their planet be different from ours?

<http://www.youtube.com/watch?v=O27uMuXaoV4>

<http://www.youtube.com/watch?v=zr9iBC8NrtQ>

Or look at why some people think we have never been to the moon and it is a hoax.

http://www.windows2universe.org/kids_space/moon_flag.html

<http://www.youtube.com/watch?v=MU6aTX2Hm0U>

Points to Note:

Problems of surviving in space with no gravity and no oxygen, and all supplies have to be taken with them.