

## Year 5 Knowledge Objectives and Knowledge Goals – SCIENCE

	The Human Body	Materials	Living Things	Forces	Astronomy	Meteorology
Week 1	<p><b>To recognise the first stages of human growth; gestation, birth and infancy</b></p> <p>Humans have a gestation period of nine months</p> <p>Human babies need immediate care and attention after birth</p> <p>Once born, humans continue to grow steadily through childhood and when they reach puberty they become able to reproduce</p>	<p><b>To understand that materials can be grouped according to their properties and to know the definitions of some properties</b></p> <p>A property is something that describes a material</p> <p>Some properties are visible, some can be found by testing</p> <p>Materials can be grouped by their properties</p>	<p><b>To recognise how plants and animals in our local area change throughout the year</b></p> <p>Oak trees grow from acorns and become a habitat for many animals</p> <p>Squirrels are mammals who can make their homes in oak trees, eat acorns, build nests and have young</p> <p>Plants and animals are interconnected within an ecosystem</p>	<p><b>A force is either a push or a pull</b></p> <p>A force is either a push or a pull</p> <p>A force can cause an object to: increase speed, decrease speed, change direction, change shape</p> <p>Gravity is a force that pulls objects to the centre of the earth</p>	<p><b>To know that astronomers believe the universe began with the Big Bang, and that it is still expanding today</b></p> <p>Galaxies are groups of stars held together by gravity</p> <p>Our galaxy is the Milky Way and our nearest neighbour is Andromeda galaxy</p> <p>Astronomers believe the universe started 14 billion years ago with a Big Bang</p>	<p><b>To know the atmosphere protects Earth and enables life</b></p> <p>Meteorology is the study of the weather</p> <p>The Atmosphere is made up of several layers of air which protect Earth from the sun's energy</p> <p>The atmosphere is essential for life on Earth</p>
Week 2	<p><b>To know that the human body changes as it goes through puberty</b></p> <p>The human body changes as it goes through puberty</p> <p>Hormones are released into bloodstream during puberty that cause physical, mental and emotional changes</p> <p>During puberty, muscles and bones grow larger, females develop breasts and their hips widen, males' shoulders widen and their voice deepens</p>	<p><b>To know that thermal conductivity means heat can be transferred through a material</b></p> <p>Thermal conductivity means heat can be transferred through a material</p> <p>Materials are selected for uses that suit their properties</p> <p>Results from an investigation can be shown using a graph.</p>	<p><b>Mammals and amphibians have different life cycles</b></p> <p>A mammal is born and grows into a mature adult</p> <p>Most amphibians hatch from eggs underwater, before beginning a process of metamorphosis</p> <p>Metamorphosis is a significant change in an animal as it grows into an adult</p>	<p><b>Friction occurs when two objects move against each other</b></p> <p>Friction gives us grip which allows us to start and stop moving</p> <p>Air resistance is a kind of friction that slows down objects moving through the air</p> <p>Water resistance is a kind of friction that slows down objects moving through water</p> <p>Upthrust is the force that can keep objects afloat</p>	<p><b>To understand that gravity is a force that holds objects together</b></p> <p>Gravity is the force which pulls all objects towards each other</p> <p>Although all objects attract all others by the force, gravity, it is too weak to notice unless one object (like the Earth) is huge</p> <p>The Earth's gravity holds us to the Earth's surface; the Sun's gravity holds the Earth in orbit around it</p>	<p><b>To know that human actions can impact the Earth's atmosphere</b></p> <p>Ozone is a gas that absorbs some of the sun's UV radiation</p> <p>By using certain harmful chemicals, humans created a hole in the ozone layer over Antarctica</p> <p>Since the harmful chemicals were banned, the hole in the ozone layer has been repairing</p>

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<p><b>Week 3</b></p>	<p><b><i>To identify physical and mental changes to the human body that happen from adulthood to old age</i></b></p> <p>Humans stop growing at about twenty years old</p> <p>Peak physical fitness for humans is between 20 and 30 years old</p> <p>Lifespan in the UK is around 80 years old</p>	<p><b><i>To understand that a solution is a mixture of a solid in a liquid where the solid has broken into parts too small to see</i></b></p> <p>Dissolving is a process where one substance becomes incorporated with another to form a solution</p> <p>A solvent is a substance that can dissolve other substances</p> <p>Some substances are soluble some are not</p>	<p><b><i>Insects and birds have different life cycles</i></b></p> <p>Queen Bumblebees build nests and fill them with pollen to feed young</p> <p>Cuckoos lay an egg in the nest of another bird and leave them to care for and feed their young</p> <p>All animals are born, grow and mature, but in very different way</p>	<p><b><i>Objects with a large surface area will have greater air resistance than other objects with a small surface area</i></b></p> <p>Air and water resistance are both a kind of friction that slows down moving objects</p> <p>We can change the shape of objects to change the air or water resistance acting upon them</p> <p>Parachutes work to slow down a falling item because they have a large surface area</p>	<p><b><i>To know the planets of our Solar System</i></b></p> <p>The Sun is at the centre of the Solar System</p> <p>Our solar system contains 8 planets, 4 terrestrial planets and 4 jovian planets</p> <p>There are also trillions of smaller rocks called asteroids, as well as dwarf planets like Pluto and Ceres</p>	<p><b><i>To know that the UK experiences six air masses affecting the weather</i></b></p> <p>Our climate is called a maritime climate, because it is largely influenced by the sea</p> <p>The polar maritime and the tropical maritime air masses bring wetter weather from the sea</p> <p>The polar continental and the tropical continental air masses bring drier weather from land</p>
<p><b>Week 4</b></p>	<p><b><i>Humans and Animals have growth stages of different lengths</i></b></p> <p>Growth is a process where cells increase in size and number in living things</p> <p>All living things follow a life cycle including birth, growth, reproduction and death</p> <p>Some living things only live a few days, some live for over 200 years, but all living things eventually die and the cycle of life continues</p>	<p><b><i>To know there are methods for separating mixtures including solutions</i></b></p> <p>Mixtures can be separated using sieves, filters, magnetism</p> <p>Dissolved solids can be regained by evaporation of the solvent</p> <p>Heating a solution can speed up the process of evaporation</p>	<p><b><i>To know that flowering plants need pollen to reproduce</i></b></p> <p>Most large plants reproduce by combining a male and female gamete (pollen and ovule) to make a fertilised egg that grows into an embryo</p> <p>The embryo or baby plant is protected inside a seed</p> <p>Most plants clothe their seeds with fruit</p>	<p><b><i>Pupils carry out an appropriate, scientific enquiry as planned last lesson to answer the question—How does surface area affect speed of fall in air (or water)?</i></b></p> <p>Undertake a fair test, controlling specified variables</p> <p>Record results in a table and bar graph, if appropriate</p> <p>Form a conclusion and explain any unexpected results</p>	<p><b><i>To understand the Moon's phases</i></b></p> <p>The moon is the Earth's natural satellite</p> <p>The moon is a planet, it does not make its own light</p> <p>Depending on the position of the Sun, we see all, part or none of the Moon; these are known as the phases of the Moon</p> <p>Neil Armstrong and Buzz Aldrin were the first humans to land on the moon</p>	<p><b><i>To know a weather front is a boundary where warm and cold air meet</i></b></p> <p>The boundary where warm and cold air meet is called a front</p> <p>Warm fronts are symbolised by a line with red semi-circles</p> <p>Cold fronts are symbolised by a line with blue triangles</p>

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<p><b>Week 5</b></p>	<p>The fifth lesson of this unit can be used for researching and planning the extended writing task. Children can collate some data in a table; such as the growth stages of a human, in preparation for including the table in their written explanation.</p> <p>They could allocate time to drawing scientific diagrams or collating data to support their writing.</p>	<p><b><i>To understand that all changes are either reversible or irreversible</i></b></p> <p>All changes are either reversible or irreversible</p> <p>Making a mixture is a reversible change</p> <p>Changes of state are reversible</p> <p>Dissolving a solid in a liquid is an example of a mixture, so it is a reversible change</p>	<p><b><i>To know that Jane Goodall and David Attenborough have dedicated their lives to studying the natural world and communicating their findings</i></b></p> <p>There are many different jobs in the world of science</p> <p>David Attenborough has studied the natural world and communicated through documentaries</p> <p>Jane Goodall spent 60 years studying the lives of chimpanzees</p>	<p><b><i>Simple machines help us to increase the force we apply to an object to help us move it</i></b></p> <p>Levers use a long pole and a pivot point to increase a force</p> <p>Pulleys use a rope running over a pulley wheel to increase a force</p> <p>Gears use cogs with teeth to increase the force</p>	<p><b><i>To understand that the Solar System is just a small part of our universe</i></b></p> <p>The universe is immensely vast</p> <p>Our Solar System is a tiny part of The Milky Way galaxy</p> <p>The Milky Way's closest neighbour is Andromeda, 2.5 million light years away</p> <p>Our home supercluster is called Laniakea and contains over 100,000 galaxies</p>	<p><b><i>To know thunder and lightning is caused by electrical charge moving through the air</i></b></p> <p>When electrical charge moves through the atmosphere it creates a flash of light and sound</p> <p>Light travels faster than sound, so we often see lightning before we hear thunder</p>
<p><b>ASSESSMENT</b></p>	<p><b><i>To show my understanding of the human reproductive and endocrine system and their role in human development</i></b></p> <p>Scientific knowledge and understanding:</p> <ul style="list-style-type: none"> <li>Humans undergo many changes as they develop from conception to old age</li> <li>Puberty is the physical process by which the human changes from child to adult and can reproduce</li> <li>As humans age, they begin to slow and sometimes problems like heart disease or arthritis occur</li> </ul>	<p><b><i>To understand that materials have properties that include solubility</i></b></p> <p><b><i>To know how to separate mixtures and that changes are reversible or irreversible</i></b></p> <p>Scientific knowledge and understanding:</p> <ul style="list-style-type: none"> <li>Properties can be grouped on the basis of their properties</li> <li>When a solute dissolves in a solvent to form a solution, the process is reversible</li> </ul>	<p><b><i>Living things grow and reproduce in a continuing cycle of life</i></b></p> <p>Scientific Understanding:</p> <ul style="list-style-type: none"> <li>There are many differences between the life cycles of mammals, amphibians, insects and birds</li> <li>Plants grow and reproduce in a continuing life cycle</li> </ul>	<p><b><i>Children can explain how forces work using diagrams to show their understanding</i></b></p> <p>Scientific Understanding:</p> <ul style="list-style-type: none"> <li>Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>Air resistance, water resistance and friction, act between moving surfaces</li> <li>Simple machines, including levers, pulleys and gears, allow a smaller force to have a greater effect</li> </ul>	<p><b><i>To demonstrate knowledge of astronomy</i></b></p> <ul style="list-style-type: none"> <li>Know the order of scale: planet, sun, solar system, galaxy, universe</li> <li>Astronomers believe the universe started 14 billion years ago in a big bang and that it is still expanding.</li> <li>Gravity is a force between all objects, and the force is bigger if the object is bigger. We can only 'feel' gravity between us and the Earth.</li> <li>Know the planets of the solar system</li> <li>Understand the reason that we see the phases of the moon</li> <li>Understand that the Solar System is just a small part of our universe</li> </ul>	<p><b><i>I can write a detailed weather report</i></b></p> <p>Scientific Understanding:</p> <ul style="list-style-type: none"> <li>Know the atmosphere protects Earth and enables life</li> <li>Know human actions can help or harm the atmosphere</li> <li>Know that four air masses affect the weather we experience in the UK</li> <li>Know a weather front is a boundary where warm and cold air meet</li> <li>Know that thunder and lightning is caused by electrical charge moving through the air</li> </ul>