

	Autumn Term	Spring Term		Summer Term
Year 5	Materials and their properties	Earth, Sun and Moon	Forces	Animals including Humans
Learning Objectives	<ul style="list-style-type: none"> Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating 	<ul style="list-style-type: none"> 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 Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. 	<ul style="list-style-type: none"> Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives. Identify the effects of air resistance, water resistance and friction, which act between moving surfaces. Recognise that some mechanisms, including levers, pulleys, and gears, allow a smaller force to have a greater effect. 	<ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans.
Working Scientifically Skills	<ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments. 	<ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments. 	<ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments. 	<ul style="list-style-type: none"> Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs Using test results to make predictions to set up further comparative and fair tests Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations Identifying scientific evidence that has been used to support or refute ideas or arguments.
Enquiry	<ul style="list-style-type: none"> Research Classifying Fair test Observation over time 	<ul style="list-style-type: none"> Observation over time Pattern seeking Research 	<ul style="list-style-type: none"> Fair test Pattern seeking 	<ul style="list-style-type: none"> Fair test Pattern seeking
Scientist	<ul style="list-style-type: none"> Spencer Silver, Arthur Fry (Post-It Notes) 	<ul style="list-style-type: none"> Dr Maggie Aderin-Pocock 	<ul style="list-style-type: none"> John Walker (The Match) 	<ul style="list-style-type: none"> Santorio Santorio (Pulse metre)
Vocabulary	Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection,	Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley	Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.
Sticky Knowledge	<ul style="list-style-type: none"> When two or more substances are mixed and remain present the mixture can be separated. Some changes can be reversed, and some cannot. Materials change state by heating and cooling 	<ul style="list-style-type: none"> Stars, planets and moons have so much mass they attract other things, including each other due to a force called gravity. Gravity works over distance. 	<ul style="list-style-type: none"> Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. 	<ul style="list-style-type: none"> The heart pumps blood around the body. Oxygen is breathed into the lungs where it is absorbed by the blood.

	<table border="1"> <thead> <tr> <th>Separating technique</th> <th>Difference in property required</th> </tr> </thead> <tbody> <tr> <td>Filtration and sieving</td> <td>A solid that does not dissolve in a liquid. Different sized solid bits</td> </tr> <tr> <td>Magnets</td> <td>Some materials magnetic others not</td> </tr> <tr> <td>Evaporation</td> <td>A solid dissolved in water and the solid has a high boiling temperature</td> </tr> <tr> <td>Floating</td> <td>Some materials float and other sink</td> </tr> </tbody> </table>	Separating technique	Difference in property required	Filtration and sieving	A solid that does not dissolve in a liquid. Different sized solid bits	Magnets	Some materials magnetic others not	Evaporation	A solid dissolved in water and the solid has a high boiling temperature	Floating	Some materials float and other sink	<ul style="list-style-type: none"> • Objects with larger masses exert bigger gravitational forces. • Objects like planets, moons and stars spin. • Smaller mass objects like planets orbit large mass objects like stars. • Stars produce vast amounts of heat and light. • All other objects are lumps of rock, metal or ice and can be seen because they reflect the light of stars. 	<ul style="list-style-type: none"> • Friction is a force against motion caused by two surfaces rubbing against each other. • Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move 	<ul style="list-style-type: none"> • Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.)
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<p style="text-align: center;">Key questions</p>	<ul style="list-style-type: none"> • What are mixtures? • What does dissolve mean? • Which of the following dissolve in water: sugar, bicarbonate of soda, oil, chocolate, coffees, dark vinegar and wax? • How does the amount of water used affect how much sugar will dissolve in it? • Which sweets dissolve in water? • How can we separate mixtures? • How can we clean our dirty water? 	<ul style="list-style-type: none"> • How does temperature/size/day length/year length change as you get closer/further to the sun? • How does distance from a light source affect how much light hits an object? • Does having more moons result in more light hitting a planet? How could you test this? • How does speed/size of a meteorite affect the size of the moon crater formed? • If the moon became heavier as a result of meteorite collisions what would happen to its position relative to Earth? • If the mass of the Earth is 80x that of the moon, why is the gravity at the Earth's surface only 6x greater than at the surface of the moon? • Why do we have day/ night/ months/ years/ seasons? • Why does day length change? • Why does shadow size change over the course of a day? 	<ul style="list-style-type: none"> • What is a force? • How can a force act on an object? • How can we see forces? • How can we measure forces? • How does the saltiness (salinity) of water affect the water resistance? • How does the length of a piece of a paper helicopter's wings affect the time it takes to fall? • How does the changing the shape of a piece of plasticine affect water resistance? • How does adding holes to a parachute affect the time it takes to fall? • How does the amount/depth of tread affect the friction between a shoe and a surface? • How can we use levers to lift heavy objects? • What is the most effective way to move an object? • How do see-saws work? • Can you create a pulley system to lift a given load? 	<ul style="list-style-type: none"> • Why do we need oxygen? • How do we breathe? • Do fish and plants breathe? • Do all living things need oxygen? • How does the size of a person's lungs affect their lung capacity? • Are there ways to increase/decrease our lung capacity? Is lung capacity fixed? • Why do we have blood? • How does our heart work? • How does size of muscle affect our pulse rate? • How does exercise effect our pulse rate? • How might the circulatory system of an elephant, a hummingbird, or a polar bear differ? • Is the air you breathe out, the same as that you breathe in? 										
<p style="text-align: center;">Prior Learning</p>	<p>In KS1 children should:</p> <ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple physical properties of a variety of everyday materials. • Compare and group together a variety of everyday materials based on their simple physical properties. • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<p>In Key Stage 1 and in Year 3 children should:</p> <ul style="list-style-type: none"> • Understand changes in weather patterns and seasons. • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing 	<p>In Year 3 children should:</p> <ul style="list-style-type: none"> • Compare how things move on different surfaces. • Know how a simple pulley works and use making lifting an object simpler • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract and repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. 											
<p style="text-align: center;">Future Learning</p>	<p>In KS3 children will learn about:</p> <ul style="list-style-type: none"> • The order of metals and carbon in the reactivity series • The use of carbon in obtaining metals from metal oxides Properties of ceramics, polymers and composites (qualitative). 	<p>In KS3 children will learn about:</p> <ul style="list-style-type: none"> • Gravity force, weight = mass x gravitational field strength (g), on Earth g=10 N/kg, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) • Our Sun as a star, other stars in our galaxy, other galaxies 	<p>In KS3 children will learn about:</p> <ul style="list-style-type: none"> • opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface • forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) 	<p>In Key Stage 3 children will learn about:</p> <ul style="list-style-type: none"> • the hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. • the tissues and organs of the human digestive system, including adaptations to function and 										

		<ul style="list-style-type: none">• The seasons and the Earth's tilt, day length at different times of year, in different hemispheres the light year as a unit of astronomical distance	<ul style="list-style-type: none">• change depending on direction of force and its size.	<p>how the digestive system digests food (enzymes simply as biological catalysts)</p> <ul style="list-style-type: none">• calculations of energy requirements in a healthy daily diet• the consequences of imbalances in the diet, including obesity, starvation and deficiency diseases• the structure and functions of the gas exchange system in humans, including adaptations to function• the effects of recreational drugs (including substance misuse) on behaviour, health and life processes.
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