



Ashbrook Junior School

Curriculum Subject Progression Overview- Science



Science

	Whole School Concept					
	Identity & Diversity	Community	Sustainable Development	Perseverance	Equality & Fairness	Creativity
Year 3	<p style="text-align: center;"><u>Rocks</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that soils are made from rocks and organic matter. <p>WALT: to be able to understand what a rock is WALT: to be able to Compare types of rocks (igneous, sedimentary and metamorphic rocks) based on their appearance</p>	<p style="text-align: center;"><u>Light</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Recognise that they need light in order to see things, and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by an opaque object. • Find patterns in the way that the size of shadows change. <p>WALT: identify sources of light</p>	<p style="text-align: center;"><u>Plants</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers. • Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of flowering plants, including pollination, 	<p><u>Working Scientifically</u> Please see below.</p>	<p style="text-align: center;"><u>Animals including humans</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food – they get nutrition from what they eat. • Identify that humans and some other animals have skeletons and muscles for support, protection and movement. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> • Names of the different food groups (fruits and vegetables, potatoes, 	<p style="text-align: center;"><u>Forces & Magnets</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Compare how things move on different surfaces. • Notice that some forces need contact between two objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles.



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	<p>WALT: to be able to investigate whether rocks let water through them (permeability). WALT: Describe in simple terms how fossils are formed WALT: Identify changes related to simple scientific ideas and explain Mary Anning's contribution to palaeontology. WALT: Recognise that soils are made from rocks and organic matter WALT: Science: Explain the rock cycle</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Compare rocks based on their appearance and physical properties •Group rocks based on their appearance and physical properties 	<p>WALT: understand how light is reflected from surfaces WALT: understand how shadows are formed WALT: investigate patterns in the way that the size of shadows change WALT: recognise that light from the sun can be dangerous WALT: classify opaque, transparent and translucent materials</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Light helps us see things •Names of different light sources e.g. torch, sun •Light sources can be both natural and man-made •The moon is not a light source but reflects the light of the sun 	<p>seed formation and seed dispersal.</p> <p>WALT: be able to identify the parts of a flower WALT: know what plants need to grow WALT: know how plants transport water WALT: know how some plants reproduce WALT: to understand the germination process WALT: Explore the life cycle of a flower</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Plants are living things •Roots can be found at the bottom of the plant •Roots absorb water and nutrients from the soil 		<p>bread, pasta and rice, oils and spreads, dairy, meats, beans fish and eggs) •Name foods that fit into the different groups •Understand a balanced diet means eating different food groups in appropriate amounts •Names of different nutrients (carbohydrates, protein, fats and oils, minerals, vitamins, dietary fibre, water) •Carbohydrates provide energy •Protein helps growth and repair •Fats and oils provide energy, help store energy and provide insulation against the cold •Bones help protect organs inside our body •Bones allow movement •Bones support the body and stop it falling down</p>	<ul style="list-style-type: none"> • Predict whether two magnets will attract or repel each other, depending on which poles are facing. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •The same item will move differently on different surfaces •A push force moves things away further •A pull force moves things closer •You can also use a twist force •A balanced force means the force is the same on both sides •An unbalanced force means the force is greater on one side than the other •Friction is a force that can slow down items when it is the greater force
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	<ul style="list-style-type: none"> •Rocks can be naturally formed or man-made •Natural forming rocks include igneous, sedimentary and metamorphic •Igneous rocks are formed from molten rocks •Sedimentary rocks are formed under the sea •Metamorphic rocks are formed from earth movements •Permeable means water can pass through •Concrete and bricks are an example of man-made rocks •Fossils are preserved remains •A fossil is a rock replica •Body fossils are the remains of animals and plants 	<ul style="list-style-type: none"> •Darkness is the absence of light •Light reflects from surfaces •The reflection of light from surfaces is what helps us to see •Some materials are more reflective than others •Ways in which reflective materials are helpful in everyday life e.g. cats eyes for roads, hi-vis jackets so people can be seen •Shadows are formed through the blocking of light •Shadows can change in size and position depending on how much light is being blocked and where the light is coming from •Light from the sun can be dangerous •Identify ways to stay safe from the sun (e.g. sun cream, hats, sun glasses, not looking directly at the sun) 	<ul style="list-style-type: none"> •The stem/ trunk helps hold the plant up •The stem/ trunk transports water from the roots to the leaves •Fruit is the part of a flowering plant that contains the seeds •Not all fruits on flowering plants are edible •Leaves are an important part of the plant as they help produce food for the plant •Name parts of a flower including anther, stamen, stigma, filament, ovary and ovules •Petals are brightly coloured to attract bees and insects •Plants need water, air, light and nutrition to grow (as well as space) •Water is transported through the plant from the roots, through the 		<ul style="list-style-type: none"> •Names of some of the bones •Organs play an important role in the body •Organs include brain, bladder, lungs, intestines, stomach, and heart •The heart is also a muscle •Roles the organs play •Muscles are attached to bones •Muscles work in pairs - one contracts while the other relaxes <p>Skills See 'working scientifically' below.</p>	<ul style="list-style-type: none"> •A magnet is a material or object that produces a magnetic field •Magnetic means something is attracted to a magnetic force •Magnets have two poles: north and south •Opposite poles attract •The same poles repel each other •Attract means come closer together •Repel means drive away •Name some items that are magnetic and consider their shared characteristics •Force can be measured using a forcemeter or Newtonmeter <p>Skills See 'working scientifically' below.</p>
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	<ul style="list-style-type: none"> • Different types of soil e.g. sandy, clay, chalk <p>Skills See 'working scientifically' below.</p>	<ul style="list-style-type: none"> • Opaque means you can't see through an object as light can't pass through • Transparent means you can see through an object as light can pass through • Translucent means light can pass through but you can't see clearly through <p>Skills See 'working scientifically' below.</p>	<p>stem to the leaves before evaporating</p> <ul style="list-style-type: none"> • Seed dispersal is the action of distributing seeds over a wide area • Seed dispersal helps seeds find new areas to grow • Name methods of seed dispersal (e.g. wind, water, shaking, eaten and passed, burst) • Pollination is the process of transfer of pollen to allow fertilisation • Plants have adapted to their environments <p>Skills See 'working scientifically' below.</p>			
Year 4	<p><u>Animals including humans</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Describe the simple functions of the basic 	<p><u>States of Matter</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Compare and group materials together, according to whether 	<p><u>Living things and their habitats</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Recognise that living things can be 	<p><u>Working Scientifically</u></p> <p>Please see below.</p>	<p><u>Electricity</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Identify common appliances that run on electricity. 	<p><u>Sound</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Identify how sounds are made, associating some of



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	<p>parts of the digestive system in humans.</p> <ul style="list-style-type: none"> Identify the different types of teeth in humans and their simple functions. Construct and interpret a variety of food chains, identifying producers, predators and prey. <p>WALT: to be able to name the different food groups and the different nutrients</p> <p>WALT: Know how to keep teeth healthy</p> <p>WALT: Investigate about tooth decay</p> <p>WALT: identify and examine different types of teeth and their functions</p> <p>WALT: identify the parts of the digestive system and their function</p> <p>WALT: demonstrate and explain the process of digestion</p>	<p>they are solids, liquids or gases.</p> <ul style="list-style-type: none"> Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C). Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. <p>WALT: be able to compare and group materials together, according to whether they are solids, liquids or gases</p> <p>WALT: know uses of gases and investigate them</p> <p>WALT: be able to observe that some materials change state when they are heated or cooled</p>	<p>grouped in a variety of ways.</p> <ul style="list-style-type: none"> Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. <p>WALT: to be able to understand the importance of habitats</p> <p>WALT: know environmental dangers to endangered species</p> <p>WALT: be able to group living things in a range of ways</p> <p>WALT: know and understand how to classify vertebrates</p> <p>WALT: know and understand how to classify invertebrates</p> <p>WALT: be able to classify living things</p>		<ul style="list-style-type: none"> Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> Electricity is a form of energy 	<p>them with something vibrating.</p> <ul style="list-style-type: none"> Recognise that vibrations from sounds travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Recognise that sounds get fainter as the distance from the sound source increases. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> Sounds are made when objects vibrate Air vibrates when objects vibrate with the air vibrations
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	<p>WALT: construct food chains for different habitats WALT: compare the teeth of different animals and link this with their role in a food chain</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Names of the different food groups (fruits and vegetables, potatoes, bread, pasta and rice, oils and spreads, dairy, meats, beans fish and eggs) •Name foods that fit into the different groups •Understand a balanced diet means eating different food groups in appropriate amounts •Names of different nutrients 	<p>WALT: be able to investigate how water can change its state to a solid, liquid or a gas WALT: be able to identify and describe the different stages of the water cycle WALT: be able to identify and describe the different stages of the water cycle</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Group different materials based on their properties/ features that can be identified •Solids stay in one place, can be held and keep their shape •Liquids can flow or be poured easily and change their shape depending on the container holding them 	<p>using a branching tree diagram</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •A habitat is a natural environment that an animal lives in •A habitat provides animals with three important things: food, shelter and a safe place to raise their young •Animals have adapted to their environments •Environments can be changed by human behaviour •Environmental changes include deforestation, flooding, volcanoes, droughts and pollution 		<ul style="list-style-type: none"> •Identify items that require electricity to work •Mains electricity is when items are plugged in •Items may use batteries instead as they require less voltage •Some items may use a mix of mains and battery electricity e.g. laptop, mobile phone, electric car where recharging is required •Identify ways to keep safe with electricity e.g. no electrical items near water, making sure wires aren't damaged •Conductors allow electricity to pass through •Insulators do not allow electricity to pass through •Metal is a good conductor of electricity •Plastic and rubber are good insulators of electricity 	<p>then travelling to enter the ear</p> <ul style="list-style-type: none"> •Sound waves can travel through different states of matter •Sound travels in waves •Sound is detected when vibrations enter the ear, sending messages to the brain •The outer ear is the part of the ear we can see •Ear wax helps protect the ear by trapping dirt and fighting infections •The auditory nerve carries messages from the cochlea to the brain •The inner ear has fluid filled tubes that help with balance •Volume is how loud or quiet the sound is •The stronger the vibration, the louder the noise •The weaker the vibration, the quieter the noise
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	<p>(carbohydrates, protein, fats and oils, minerals, vitamins, dietary fibre, water)</p> <ul style="list-style-type: none"> •Carbohydrates provide energy •Protein helps growth and repair •Fats and oils provide energy, help store energy and provide insulation against the cold •Not eating enough can lead to health concerns •Food chains show how living things rely on each other for survival •Identify examples of food chains •Teeth are important for cutting and chewing food •We can keep teeth healthy by cleaning them twice a day 	<ul style="list-style-type: none"> •Gases are often invisible and do not have a fixed shape •Solids, liquids and gases can change state when they are heated or cooled •Some solids when heated will melt and turn into a liquid •The temperature something melts at is called melting point •Different materials have different melting points •When a liquid is cooled, it freezes and turns into a solid •When a liquid is heated, it boils and turns into a gas •The temperature a liquid boils at is called boiling point •When liquid turns into a gas, this is called evaporation •When a gas is cooled, it turns into a liquid •When gases turn into liquids, this is called condensation 	<ul style="list-style-type: none"> •Sort animals/ plants based on common characteristics •Mammals are warm-blooded and give birth to live young •Amphibians are cold-blooded, have moist skin and lay eggs •Birds are warm-blooded, have feathers and lay eggs •Reptiles are cold-blooded, have scales and lay eggs •Vertebrate means having a spine •Invertebrate means not having a spine •Use a classification key to separate animals •Animals and plants are classified to focus in on common characteristics e.g. not having a fish and 		<ul style="list-style-type: none"> •We need conductors and insulators so electricity can move freely without injuring people •How to make a circuit •Names of parts of a circuit e.g. battery/cell, wire, bulb, motor, buzzer •A switch allows electrical current to flow when on and stops the flow when off <p>Skills See 'working scientifically' below.</p>	<ul style="list-style-type: none"> •Pitch is how high or low the sound is •A high sound has a high pitch •A low sound has a low pitch •The closer to a sound, the louder it will sound •The further away from a sound, the quieter it will sound <p>Skills See 'working scientifically' below.</p>
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	<ul style="list-style-type: none"> •We can keep teeth healthy by limiting our sugar intake •Examples of teeth include canines, incisors and molars •Digestion is how the body breaks down food so it can be taken in and used •Name parts of the digestive system e.g. mouth, stomach, large intestine, small intestine etc <p>Skills See 'working scientifically' below.</p>	<ul style="list-style-type: none"> •The water cycle is an example of condensation and evaporation <p>Skills See 'working scientifically' below.</p>	<p>a bird grouped together</p> <p>Skills See 'working scientifically' below.</p>		
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Working Scientifically Skills for Y3&4

Asking questions and recognising that they can be answered in different ways

Asking relevant questions and using different types of scientific enquiries to answer them

- The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions.
- The children answer questions posed by the teacher.
- Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.



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Making observations and taking measurements
Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers <ul style="list-style-type: none">• The children make systematic and careful observations.• They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.
Engaging in practical enquiry to answer questions
Setting up simple practical enquiries, comparative and fair tests <ul style="list-style-type: none">• The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher.• They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.
Recording and presenting evidence
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables <ul style="list-style-type: none">• The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams.• Children are supported to present the same data in different ways in order to help with answering the question.
Answering questions and concluding
Using straightforward scientific evidence to answer questions or to support their findings. <ul style="list-style-type: none">• Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.
Identifying differences, similarities or changes related to simple scientific ideas and processes <ul style="list-style-type: none">• Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions <ul style="list-style-type: none">• They draw conclusions based on their evidence and current subject knowledge.



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Evaluating and raising further questions and predictions						
Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions						
• They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry.						
Year 5	<p><u>Properties and changes of Materials</u> National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • 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, 	<p><u>Forces</u> National Curriculum Objectives:</p> <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. • Identify the effects of air resistance, water resistance and friction that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. <p>WALT be able to understand what the different forces are WALT understand how gravity works</p>	<p><u>Living things and their habitats</u> National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Describe the life process of reproduction in some plants and animals. <p>WALT: Identify the different parts of a flower WALT: Understand the role of each part of a flower WALT: Understand the difference in reproduction WALT: Identify the life cycle of different living things WALT: Identify differences in the life cycle of living things</p>	<p><u>Working Scientifically</u> Please see below.</p>	<p><u>Earth & Space</u> National Curriculum Objectives:</p> <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. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky. <p>What children need to know/ be able to do by the end of this unit:</p>	<p><u>Animals including humans</u> National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Describe the changes as humans develop to old age. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> • There are different stages of human life (6 main ones once we are born) • Prenatal means before birth • The six stages once you are born include: infancy, childhood, adolescence, early adulthood, middle adulthood and old age • We develop in different ways • The average length of human gestation is



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	<p>sieving and evaporating.</p> <ul style="list-style-type: none"> • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. <p>WALT be able to group materials in different ways WALT understand the different properties of gases, solids and liquids WALT know that</p>	<p>WALT be able to identify the effects of friction acting between moving surfaces WALT understand air and water resistance WALT understand who Issac Newton was WALT know how to create forces using mechanisms such as pulleys, gears and levers</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •The same item will move differently on different surfaces •A push force moves things away further •A pull force moves things closer •You can also use a twist force •A balanced force means the force is the same on both sides 	<p>WALT: Identify different gestation periods</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Plants are living things •Leaves are an important part of the plant as they help produce food for the plant •Name parts of a flower including anther, stamen, stigma, filament, ovary and ovules •There are male and female parts of a plant •Reproduction means creating offspring •Some plants reproduce using sexual reproduction (physical contact through bees and insects) •Some plants reproduce using 		<ul style="list-style-type: none"> •There are eight planets in the solar system •Pluto used to be a planet but is now recognised as a dwarf planet •Names of the planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus) •The sun is at the centre of the solar system with planets orbiting the sun (heliocentric model of the universe) •People used to believe in a geocentric model where Earth was the centre of the solar system •The Sun, Earth and Moon are spherical bodies of different sizes •Earth is tilted at a 23.5 degree axis and 	<p>40 weeks or 9 months</p> <ul style="list-style-type: none"> •Different animals have different periods of gestation •After 8-9 weeks, an embryo is called a fetus •Infancy lasts the first few years of life - there are big developments such as growing, brain developing, learning to walk and talk •During childhood, children continue to develop physically and mentally, growing in height and learning new things every day •Puberty is the stage of development between childhood and young adult •People will experience puberty in different ways •Identify particular features of puberty with shared examples e.g. sweat more, grow pubic hair and specific examples
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	<p>some materials will dissolve in liquid to form a solution WALT be able to describe how to recover a substance from a solution WALT be able to use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating WALT be able to give reasons for the particular uses of everyday materials, including metals, wood and plastic, (based on evidence from comparative and fair tests) WALT be able to demonstrate that dissolving, mixing and changes of state are reversible changes WALT be able to explain that some changes result in the formation of new materials</p>	<ul style="list-style-type: none"> •An unbalanced force means the force is greater on one side than the other •Friction, air resistance, water resistance and gravity are examples of forces •Friction is a force that can slow down items when it is the greater force •Air resistance is an example of friction in action •Air resistance is the force that acts in the opposite direction to an object moving through the air •Water resistance is an example of friction in action •Water resistance is the force that acts in the opposite direction to an object moving through water/ other liquids/ fluids •You can reduce/ increase air and water resistance 	<p>asexual reproduction (only one parent)</p> <ul style="list-style-type: none"> •There are positives and negatives to both examples of reproduction in plants •Animals reproduce in different ways •Life cycle of a mammal •Life cycle of an amphibian •Life cycle of an insect •Life cycle of a bird •Identify similarities and differences between different life cycles •Animals have different gestation periods •Case study of a famous scientist who has worked in the field e.g. Jane Goodall <p>Skills See 'working scientifically' below.</p>		<p>does one full rotation every 24 hours</p> <ul style="list-style-type: none"> •Earth orbits the Sun with a full orbit taking 365.25 days - this is why we have a leap year every four years •As we orbit the Sun and rotate, we sometimes face towards the Sun (day time) and at other points face away from the Sun (night time) •We have seasons because of our position to the Sun when we orbit - we are tilted towards the Sun during Summer and away from the Sun during Winter •The Moon orbits the Earth •A lunar month lasts 27.3 days with different phases of the moon (e.g. 	<p>such as periods and growing facial hair</p> <ul style="list-style-type: none"> •Early adulthood is when the body is at its peak of fitness and strength - the age most humans reproduce and where humans can take care of their physical needs independently •Features of a balanced diet and why it is important to stay fit and healthy (recap of prior learning) •During middle age, reproductive ability reduces and people go through physical changes •During old age, the body declines in fitness and health and there is no physical growth yet mental development may still occur <p>Skills See 'working scientifically' below.</p>
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	<p>(and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda)</p> <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none">•Group different materials based on their properties/ features that can be identified•Solids stay in one place, can be held and keep their shape•Liquids can flow or be poured easily and change their shape depending on the container holding them•Gases are often invisible and do not have a fixed shape•Solids, liquids and gases can change state when they are heated or cooled	<ul style="list-style-type: none">•Name reasons why you would want to reduce/ increase air or water resistance•Gravity is a force that attracts a body towards the centre of the earth•We can create/ change forces using things such as pulleys, gears and levers•Force can be measured using a forcemeter or Newtonmeter <p>Skills See 'working scientifically' below.</p>			<p>waxing crescent, waning gibbous)</p> <ul style="list-style-type: none">•A 'full moon' is only ever a half moon <p>Skills See 'working scientifically' below.</p>	
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	<ul style="list-style-type: none">•Dissolving means an item becomes incorporated into a liquid•Dissolving can be a reversible or irreversible change•Identify different examples of melting, freezing and dissolving•Identify different examples of reversible and irreversible changes•Understand that materials can be separated through different methods such as sieving and filtering•Identify different uses for materials•Identify uses for different materials, considering issues of design and why some materials may be used and others may not be e.g. soft, flexible, waterproof•Some materials are flammable•Flammable materials can be					
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	useful as well as being dangerous					
	Skills - please see below					
Year 6	<p style="text-align: center;"><u>Light</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 	<p style="text-align: center;"><u>Animals including humans</u></p> <p>National Curriculum Objectives:</p> <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. <p>What children need to know/ be able to do by the end of this unit:</p>	<p style="text-align: center;"><u>Electricity</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram. <p>What children need to know/ be able to do by the end of this unit:</p>	<p style="text-align: center;"><u>Evolution</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. • Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. <p>What children need to know/ be able to</p>	<p style="text-align: center;"><u>Living things and their habitats</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for classifying plants and animals based on specific characteristics. <p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> • Sort animals/ plants based on common characteristics 	<p style="text-align: center;"><u>Sound Enquiry</u></p> <p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.



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	<p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •Light helps us see things •Names of different light sources e.g. torch, sun •Light reflects from surfaces •The reflection of light from surfaces is what helps us to see •Shadows are formed through the blocking of light •Shadows can change in size and position depending on how much light is being blocked and where the light is coming from •Opaque means you can't see through an object as light can't pass through •Transparent means you can see through an object as light can pass through •Translucent means light can pass 	<ul style="list-style-type: none"> •Understand a balanced diet means eating different food groups in appropriate amounts •Names of different nutrients (carbohydrates, protein, fats and oils, minerals, vitamins, dietary fibre, water) •The circulatory system is made up of blood vessels, the heart and blood •Blood travels through blood vessels carrying oxygen, water and nutrients and removing waste products like carbon dioxide •The heart is a muscle that pumps blood around the body •Blood is pumped to the lungs to become oxygenated, then travels back to the heart before being pumped around the body and back to the heart 	<ul style="list-style-type: none"> •Electricity is a form of energy •Mains electricity is when items are plugged in - this is more dangerous than battery powered items as there is a higher voltage •Items may use batteries instead as they require less voltage •Some items may use a mix of mains and battery electricity e.g. laptop, mobile phone, electric car where recharging is required •Conductors allow electricity to pass through •Insulators do not allow electricity to pass through •How to make a circuit •Names of parts of a circuit e.g. battery/cell, wire, bulb, motor, buzzer •A switch allows electrical current to flow when on and 	<p>do by the end of this unit:</p> <ul style="list-style-type: none"> •Inheritance means a physical feature/ characteristic that you get from a family member •Some characteristics are inherited and some are acquired •Name examples of features that are inherited e.g. eye colour, hair colour, skin complexion •Some inherited characteristics may come from grandparents rather than parents •Selective breeding is when animals or plants are bred together for particular characteristics •Fossils are preserved remains •A fossil is a rock replica •Body fossils are the remains of animals and plants 	<ul style="list-style-type: none"> •Previous information from Year 4 unit including: Mammals are warm-blooded and give birth to live young; Amphibians are cold-blooded, have moist skin and lay eggs; Birds are warm-blooded, have feathers and lay eggs etc. •Vertebrate means having a spine •Invertebrate means not having a spine •Use a classification key to separate animals •Animals and plants are classified to focus in on common characteristics e.g. not having a fish and a bird grouped together •Carl Linnaeus was a scientist who created the classification system still used today •Features of the Linnaean system of classification e.g. 	<p>What children need to know/ be able to do by the end of this unit:</p> <ul style="list-style-type: none"> •recognise that light appears to travel in straight lines •use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye •explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes •use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <p>Skills</p>
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	<p>through but you can't see clearly through</p> <ul style="list-style-type: none"> •Light waves travel in a straight line •Light can refract as well as reflect •Refraction is the change in the speed of a wavelength as it passes through a material •Refraction is most commonly seen with light and transparent objects such as glass or water •When light is shone through a prism, the ray of light refracts into the colours of the rainbow •Name parts of the eye e.g. pupil, lens, retina, optic nerve •Light enters the eye through the pupil •The iris contracts and relaxes to control the amount of light entering the eye •The optic nerve carries messages from the eye to the brain 	<ul style="list-style-type: none"> •Lungs give oxygen that we breathe in to the blood and remove carbon dioxide to breathe out •Exercise and lifestyle can affect our body, both positively and negatively (identify poor diet etc. and how exercise improves health and fitness, including wellbeing) •Muscles are attached to bones •Muscles work in pairs - one contracts while the other relaxes •Exercise helps muscles become stronger •Muscles are provided with oxygen and nutrients as blood is pumped around the body to provide energy •Muscles begin to tire and ache as they use oxygen faster 	<p>stops the flow when off</p> <ul style="list-style-type: none"> •Identify where circuits wouldn't work and the reason why e.g. break in the circuit, battery/ cell missing •Name the symbols used for different components of a circuit •Draw a circuit diagram accurately •Create different circuits and draw circuit diagrams to represent these •Voltage is an electrical pressure that pushes charged electrons around a circuit •Voltage can be measured using a voltmeter <p>Skills See 'working scientifically' below.</p>	<ul style="list-style-type: none"> •Adaptation is adapting to an environment to help survive •If a species can't adapt to an environment, they may die out •Name examples of how humans adapt to environments e.g. when it is hotter or colder •Finches adapted to their environment through changes to their beaks •Charles Darwin is famous for his work on evolution after seeing the finches on the Galapagos Islands •Evolution is the process of living things developing over time <p>Skills See 'working scientifically' below.</p>	<p>Domain, Kingdom etc.</p> <ul style="list-style-type: none"> •Genus and species are how living things get their scientific names •Micro-organisms are organisms that are too small to see by the naked eye •Some bacteria can be good and helpful e.g. penicillin, bacteria in yoghurts, yeast •Some bacteria can be harmful e.g. bacteria in rotten food, uncooked meat, diseases •Scientists are continually developing their knowledge and finding new living things to classify <p>Skills See 'working scientifically' below.</p>	<p>See 'working scientifically' below.</p>
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	<p>Skills See 'working scientifically' below.</p>	<p>than our body can provide it</p> <ul style="list-style-type: none"> • Drugs can be beneficial to the body e.g. medicines • Drugs can be harmful to the body - illegal drugs, caffeine etc. <p>Skills See 'working scientifically' below.</p>				
Working Scientifically Skills for Y5&6						
Asking questions and recognising that they can be answered in different ways						
<p>Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <ul style="list-style-type: none"> • Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work. 						
Making observations and taking measurements						
<p>Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <ul style="list-style-type: none"> • The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value). 						
Engaging in practical enquiry to answer questions						



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Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

- The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.

Recording and presenting evidence

Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs

- The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys.
- Children present the same data in different ways in order to help with answering the question.

Answering questions and concluding

Identifying scientific evidence that has been used to support or refute ideas or arguments

- Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer.
- They talk about how their scientific ideas change due to new evidence that they have gathered.
- They talk about how new discoveries change scientific understanding.

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

- In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge.

Evaluating and raising further questions and predictions

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

- They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used.
- They identify any limitations that reduce the trust they have in their data.