Progression in Science

Intent

At our school our intent is for children to recognise the importance of Science in every aspect of their daily life. We aim to develop the children's natural curiosity, encourage respect for living things and the physical environment and provide opportunities for evaluation of evidence. We drive to build on their knowledge year on year within our Science curriculum that deepens their understanding and learning to enable them to become enquiry based learners and develops a passion for the subject that they may further investigate as they move through their education journey.

Implementation

The teaching and implementation of the Science Curriculum at our school is based on the National Curriculum and linked to topics to ensure a well-structured approach to this subject. Teachers use Cornerstones to support planning, this ensures that there is a breadth of Science strands being taught and progression across the key stages is clear.
Whilst some of our Science work is taught in discreet sequences of lessons, we endeavour to link our topic work to the Science curriculum where possible to provide context and better understanding of concepts. Teaching of Science through the school has a focus on practical investigative opportunities for the children and is supported by cross curricular work where applicable.
Attainment is assessed after a topic has been taught through assessment tasks and recording in children's assessment booklet.
In the EYFS children are assessed using Tapestry and have weekly challenges to complete that may have a science focus.

Impact

Our overall impact is measured by whether the children meet age related expectations and are able to retain the knowledge and skills they have learnt and apply these to new situations year on year.
We want our children to be able to question ideas and reflect and use their knowledge, to work collaboratively to investigate and experiment in order to find answers to their questions.

National Curriculum requirements:

EYFS requirements:

Understanding the World (The World)

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

Key Stage 1 National Curriculum

Working Scientifically

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- *asking simple questions and recognising that they can be answered in different ways;*
- *observing closely, using simple equipment;*
- *performing simple tests;*
- *identifying and classifying;*
- *using their observations and ideas to suggest answers to questions;*
- *gathering and recording data to help in answering questions.*

Year 1 Areas of study	***Year 2 Areas of study***
Plants	*Living things and their habitats*
Animals, including humans	*Plants*
Everyday materials	*Animals, including humans*
Seasonal change	*Use of everyday materials*

Lower Key Stage 2 National Curriculum
Working scientifically
During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- *asking relevant questions and using different types of scientific enquiries to answer them*
- *setting up simple practical enquiries, comparative and fair tests*
- *making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers*
- *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*
- *reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions*
- *using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions*
- *identifying differences, similarities or changes related to simple scientific ideas and processes*
- *using straightforward scientific evidence to answer questions or to support their findings.*

Year 3 Areas of study	***Year 4 Areas of study***
Plants	*Living things and their habitats*
Animals, including humans	*Animals, including humans*
Rocks	*States of matter*
Light	*Sound*
Forces and matter	*Electricity*

Upper Key Stage 2 National Curriculum
Working scientifically
During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- *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 a 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*

Year 5 Areas of study	***Year 6 Areas of study***
Living things and their habitats	*Living things and their habitats*
Animals, including humans	*Animals, including humans*
Properties and changes of materials	*Evolution and inheritance*
Earth and Space	*Light*
Forces	*Electricity*

Working Scientifically - Progression through the school

	EYFS	Year 1 and 2	Year 3 and 4	Year 5 and 6
Working scientifically *Questioning and planning*	▪ *Ask simple questions* ▪ *Begin to recognise that questions can answered in different ways*	▪ *Ask questions about the world around us* ▪ *Recognise that questions can be answered in different ways*	▪ *Ask relevant questions and use different types of scientific enquiry to answer them.* ▪ *Raise their own questions about the world around them.* ▪ *Begin to develop their ideas about functions, relationships and interactions.*	▪ *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.* ▪ *Explore and talk about ideas, ask their own questions about scientific phenomena, analyse functions, relationships and interactions more systematically.* ▪ *Begin to recognise more abstract ideas and begin to recognise how these help them to understand how the world operates.* ▪ *Select the most appropriate ways to answer scientific questions.*
Working scientifically *Observing & measuring Pattern seeking*	▪ *Begin to observe closely.* ▪ *Use simple observations and ideas to suggest answers.* ▪ *To observe changes over time and begin to notice patterns.* ▪ *To say what I am looking for and what I am measuring.* ▪ *Use simple measurements and equipment with support (hand lenses and egg timers).*	▪ *Observe closely, using simple equipment.* ▪ *Use observations and ideas to suggest answers to questions.* ▪ *Observe changes over time and begin to notice patterns and relationships.* ▪ *To know how to use simple equipment.* ▪ *Begin to use standard units of measure.*	▪ *Make careful and systematic observations and take more accurate measurements using standard units.* ▪ *Use a range of equipment to answer questions.* ▪ *Begin to look for naturally occurring patterns and relationships and decide what data to collect.* ▪ *Help to make decisions about their observations.* ▪ *Learn to use new equipment appropriately.* ▪ *Can see patterns in their results.* ▪ *Can choose from a selection of equipment to use for an investigation.* ▪ *Can observe and measure with increasing accuracy using standard units.*	▪ *Take measurements using a range of scientific equipment with increased accuracy and precision.* ▪ *Identify patterns that might be found in the natural environment.* ▪ *Make their own decisions about what observations to make, what measurements to take and how long to make them for and whether to repeat them.* ▪ *Choose appropriate equipment for an investigation.* ▪ *Can interpret data and patterns.* ▪ *Can make a set of observations and say what the interval and range are.* ▪ *Take accurate and precise measurements and record them appropriately.*
Working scientifically *Investigating*	▪ *Perform simple investigations with support.* ▪ *Can discuss my ideas* ▪ *Can begin to say what happened in my investigation.*	▪ *Can perform simple investigations.* ▪ *Can discuss my ideas in more detail.* ▪ *Can begin to say what happened in my investigation.*	▪ *Begin to set up simple practical enquiries, comparative and fair tests.* ▪ *Recognise when a simple fair test is necessary and help to decide how to set it up.* ▪ *Can think of more than one variable factor.*	▪ *Use test results to make predictions to set up further fair tests.* ▪ *Recognise when and how to set up comparative and fair tests and explain which variables need to be controlled and why.* ▪ *Suggest improvements to methods and give reasons.* ▪ *Decide when it is appropriate to do fair tests.*
Working scientifically *Recording and reporting*	▪ *Gather and record data with some adult support.* ▪ *Begin to record simple data.* ▪ *Begin to communicate their findings*	▪ *Gather and record data to help in answering questions.* ▪ *Record simple data.* ▪ *Record and communicate their findings in a range of ways.*	▪ *Gather, record, classify and present data in a variety of ways to answer questions.* ▪ *Record findings using simple scientific language, drawings, labelled diagrams,*	▪ *Record data and results of increasing complexity using scientific diagrams and labels, tables, keys and bar and line graphs.* ▪ *Report and record findings from*

findings		▪ *Can show results in a table that my teacher has provided.*	*keys, bar charts and tables.* ▪ *Report on findings from enquiries, including oral and written explanations.* ▪ *Use notes, simple tables and standard units to record and analyse their data.* ▪ *Can record results in tables and charts.*	*investigations.* ▪ *Decide how to record data from a choice of familiar approaches.* ▪ *Can choose how best to present data.*
Working scientifically *Identifying, grouping and classifying*	▪ *Identify and classify with support.* ▪ *Begin to observe and identify, compare and describe.* ▪ *Begin to use simple features to compare objects, materials and living things*	▪ *Identify and classify.* ▪ *Observe and identify, compare and describe.* ▪ *Use simple features to compare objects, materials and living things and decide how to sort and group them.*	▪ *Identify differences, similarities or changes related to simple scientific ideas and processes.* ▪ *Talk about criteria for grouping, sorting and classifying and use simple keys.* ▪ *Compare and group according to behaviour or properties.*	▪ *Use and develop keys and other information records to identify, classify and describe living things and materials.*
Working scientifically *Research*	▪ *Begin to use secondary sources to find answers.* ▪ *To begin to find information to help me from books and computers with help.*	▪ *Use simple secondary sources to find answers.* ▪ *Can find information to help me from books and computers with some help.*	▪ *Begin to recognise when and how secondary sources might help to answer questions that cannot be answered through practical investigations.*	▪ *Recognise which secondary sources will be of most use to research their ideas.*
Working scientifically *Conclusions*	▪ *Begin to talk about what they have found.* ▪ *Begin to say what happened in their investigation.* ▪ *Can say whether they were surprised at results or not.* ▪ *Begin to say what they would change about their investigation.*	▪ *Talk about what they have found out and how they found it out.* ▪ *To say what happened in their investigation.* ▪ *To say whether they were surprised at the results or not.* ▪ *To say what they would change about their investigation.*	▪ *Using results to draw simple conclusions, make predictions, suggest improvements and raise further questions.* ▪ *Use scientific evidence to answer questions.* ▪ *Begin to look for patterns, similarities and differences in their data.* ▪ *Begin to identify new questions arising from their data, make new predictions and find ways of improving what they have already done.* ▪ *Can see patterns in their results.* ▪ *Can say what they have found out beginning to link cause and effect.* ▪ *Can say how I could make their investigation better.*	▪ *Report and present findings from enquiries including conclusions, relationships and explanations in oral and written forms.* ▪ *Identify scientific evidence that has been used to support or refute ideas or arguments.* ▪ *Draw conclusions based on their data and observations.* ▪ *Use their evidence to justify their ideas using scientific knowledge and understanding.* ▪ *Use test results to make predictions to set up further comparatives and fair tests.* ▪ *Look for patterns, similarities and differences in their data.* ▪ *Use their results to identify when further tests and observations are needed.* ▪ *Can draw conclusions and identify scientific evidence.* ▪ *Can use simple models.* ▪ *Know which evidence proves a scientific point.* ▪ *Use test results to make predictions to set up further comparative and fair tests.*

Progression in Knowledge and Skills – Topic Specific

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Humankind	Human body	AOL: World The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. Different body parts are used for different things, such as the eyes are used to see. Draw pictures of the human body and name some of the different body parts. optional	The basic body parts are the head, arms, legs, nose, eyes, ears, mouth, hands and feet. The five senses are hearing, sight, smell, taste and touch. Ears are used for hearing, eyes are used to see, the nose is used to smell, the tongue is used to taste and skin gives the sense of touch. Draw and label the main parts of the human body and say which body part is associated with which sense. covered x 2	Human offspring go through different stages as they grow to become adults. These include baby, toddler, child, teenager, adult and elderly. Describe the stages of human development (baby, toddler, child, teenager, adult and elderly). covered x 3	Humans have a skeleton and muscles for movement, support and protecting organs. Major bones in the human body include the skull, ribs, spine, humerus, ulna, radius, pelvis, femur, tibia and fibula. Major muscle groups in the human body include the biceps, triceps, abdominals, trapezius, gluteals, hamstrings, quadriceps, deltoids, gastrocnemius, latissimus dorsi and pectorals. Describe how humans need the skeleton and muscles for support, protection and movement. covered x 2 optional	The digestive system is responsible for digesting food and absorbing nutrients and water. The main parts of the digestive system are the mouth, oesophagus, stomach, small intestines, large intestines and rectum. The mouth starts digestion by chewing food and mixing it with saliva. The oesophagus transports the chewed food to the stomach, where it mixes with stomach acid and gets broken down into smaller pieces. In the small intestine, nutrients from the food are absorbed by the body. In the large intestine, water is absorbed by the body. The remaining undigested waste is stored in the rectum before excretion through the anus. Describe the purpose of the digestive system, its main parts and each of their functions. covered	Humans reproduce sexually, which involves two parents (one female and one male) and produces offspring that are different from the parents. Describe the process of human reproduction. covered	The circulatory system includes the heart, blood vessels and blood. The heart pumps blood through the blood vessels and around the body. There are three types of blood vessel: arteries, veins and capillaries. They each have a different-sized hole (lumen) and walls. The blood carries gases (oxygen and carbon dioxide), water and nutrients to where they are needed. The red blood cells carry oxygen and carbon dioxide around the body. The blood also contains white blood cells, which protect the body from infection. Name and describe the purpose of the circulatory system and the functions of the heart, blood vessels and blood. covered x 4

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Staying safe	AOL: PSED Rules help to keep us safe in different environments and when using certain equipment. Follow instructions when in different environments and when handling simple equipment, such as scissors. Assign	It is important to stay safe. Some ways to stay safe include staying safe in strong sunlight (sun cream, sun hat and sunglasses), crossing roads (stop, look and listen), in the kitchen (not touching hot or sharp objects) and with household chemicals (not touching, drinking or eating). Describe ways to stay safe in some familiar situations. covered x 2	Humans need water, food, air and shelter to survive. Describe what humans need to survive. covered optional	Light from the Sun is damaging for vision and the skin. Protection from the Sun includes sun cream, sun hats, sunglasses and staying indoors or in the shade. Explain why light from the Sun can be dangerous. covered optional	Working with electrical circuits can be dangerous. Precautions include not touching electrical components with wet hands and not putting batteries in mouths. Explain the precautions needed for working safely with electrical circuits. covered	Very hot and very cold materials can burn skin. Heating materials should be done safely. Explain the precautions needed for working safely when heating, burning, cooling and mixing materials. covered	Lasers are intense beams of light and they should never be pointed at people's faces or aircraft. Explain the dangers of using lasers and ways to use them safely. covered
	Healthy lifestyle	AOL: PSED Washing and drying their hands, especially after using the toilet and before eating, helps stop the spread of harmful germs. Wash and dry hands regularly and say why this is important. covered x 2 optional	Hand washing and good hygiene are important parts of a healthy lifestyle and prevent the spread of germs. Explain why hand washing and cleanliness are important. covered optional	A healthy lifestyle includes exercise, good personal hygiene, good quality sleep and a balanced diet. Risks associated with an unhealthy lifestyle include obesity, tooth decay and mental health problems. Describe the importance of a healthy lifestyle, including exercise, a balanced diet, good quality sleep and personal hygiene. covered x 9	Humans have to get nutrition from what they eat. It is important to have a balanced diet made up of the main food groups, including proteins, carbohydrates, fruit and vegetables, dairy products and alternatives, and fats and spreads. Humans need to stay hydrated by drinking water. Explain the importance and characteristics of a healthy, balanced diet. covered x 2	Regular teeth brushing, limiting sugary foods and visiting the dentist are important for good oral hygiene. Describe what damages teeth and how to look after them. covered	Good personal hygiene (washing, wearing clean clothes and brushing teeth) can prevent disease or illness. Puberty is the period during which adolescents reach sexual maturity and become capable of reproduction. It causes physical and emotional changes. Explain why personal hygiene is important during puberty. covered	Lifestyle choices can have a positive (exercise and eating healthily) or negative (drugs, smoking and alcohol) impact on the body. Explain the impact of positive and negative lifestyle choices on the body. covered x 3 optional x 3

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Processes	Pattern seeking	AOL: World The weather can change throughout the day, week and month. The weather is different at different times in the year. Notice and begin to describe patterns of weather in summer and winter. covered optional	There are four seasons: spring, summer, autumn and winter. Certain events and weather patterns happen in different seasons. Observe changes across the four seasons. covered x 6 optional x 2	The UK has typical weather in each of the seasons. For example, winter is cold and sometimes frosty, whereas summer is warm and sometimes sunny. Describe typical UK seasonal weather patterns. covered optional	Shadows change shape and size when the light source moves. For example, when the light source is high above the object, the shadow is short and when the light source is low down, the object's shadow is long. Find patterns in the way shadows change during the day. covered optional	Pitch is how high or low a sound is. Parts of an instrument that are shorter, tighter or thinner produce high-pitched sounds. Parts of an instrument that are longer, looser or fatter produce low-pitched sounds. Compare and find patterns in the pitch of a sound, using a range of equipment, such as musical instruments. covered Volume is how loud or quiet a sound is. The harder an instrument is hit, plucked or blown, the stronger the vibrations and the louder the sound. Compare and find patterns in the volume of a sound, using a range of equipment, such as musical instruments. covered	As Earth orbits the Sun, it also spins on its axis. It takes Earth a day (24 hours) to complete a full spin. During the day, the Sun appears to move through the sky. However, this is due to the Earth rotating and not the Sun moving. Earth rotates to the east or, if viewed from above the North Pole, it rotates anti-clockwise, which means the Sun rises in the east and sets in the west. As Earth rotates, different parts of it face the Sun, which brings what we call daytime. The part facing away is in shadow, which is night time. Use the idea of Earth's rotation to explain day and night, and the Sun's apparent movement across the sky. covered x 2 optional	A shadow appears when an object blocks the passage of light. Apart from some distortion or fuzziness at the edges, shadows are the same shape as the object. The distortion or fuzziness depends on the position or type of light source. Explain, using words, diagrams or a model, why shadows have the same shape as the objects that cast them and how shadows can be changed. covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Changes	AOL: World The number of daylight hours varies throughout the year, according to the season. The days are longer in summer and shorter in winter. Notice and talk about the differences in day length between the seasons. Assign	Day length (the number of daylight hours) is longer in the summer months and shorter in the winter months. Observe and describe how day length changes across the year. covered	Some objects and materials can be changed by squashing, bending, twisting, stretching, heating, cooling, mixing and being left to decay. Describe how some objects and materials can be changed and how these changes can be desirable or undesirable. covered	Fossils form over millions of years and are the remains of a once-living organism, preserved as rock. Scientists can use fossils to find out what life on Earth was like in prehistoric times. Fossils form when a living thing dies in a watery environment. The body gets covered by mud and sand and the soft tissues rot away. Over time, the ground hardens to form sedimentary rock and the skeletal or shell remains turn to rock. Describe simply how fossils are formed, using words, pictures or a model. covered	Heating or cooling materials can bring about a change of state. This change of state can be reversible or irreversible. The temperature at which materials change state varies depending on the material. Water changes state from solid (ice) ⇌ liquid (water) at 0°C and from liquid (water) ⇌ gas (water vapour) at 100°C. The process of changing from a solid to liquid is called melting. The reverse process of changing from a liquid to a solid is called freezing. The process of changing from a liquid to a gas is called evaporation. The reverse process of changing from a gas to a liquid is called condensation. Observe and explain that some materials change state when they are heated or cooled and measure or research the temperature in degrees Celsius (°C) at which materials change state. covered x 3	Reversible changes include heating, cooling, melting, dissolving and evaporating. Irreversible changes include burning, rusting, decaying and chemical reactions. Identify, demonstrate and compare reversible and irreversible changes. covered x 5	Describe some significant changes that have happened on Earth and the evidence, such as fossils, that support this. covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Earth	AOL: World Ways to describe daily weather include sunny, rainy, windy, cloudy, warm or cold. Weather is warmer in the summer with more sunshine and colder in the winter with more snow, hail and rain. Describe simply how weather changes as the seasons change. covered x 2 optional x 4	Different types of weather include sunshine, rain, hail, wind, snow, fog, lightning, storm and cloud. The weather can change daily and some weather types are more common in certain seasons, such as snow in winter. Observe and describe different types of weather. covered x 2	The Earth is spherical and is covered in water and land. When it is daytime in one location, it is night time on the other side of the world. Describe features of Earth using words and pictures. optional	Soils are made from tiny pieces of eroded rock, air and organic matter. There are a variety of naturally occurring soils, including clay, sand and silt. Different areas have different soil types. Investigate soils from the local environment, making comparisons and identifying features. covered	The water cycle has four stages: evaporation, condensation, precipitation and collection. Water in lakes, rivers and streams is warmed by the Sun, causing the water to evaporate and rise into the air as water vapour. As the water vapour rises, it cools and condenses to form water droplets in clouds. The clouds become full of water until the water falls back to the ground as precipitation (rain, hail, snow and ice). The fallen water collects back in lakes, rivers and streams. Evaporation and condensation are caused by temperature changes. Describe the water cycle using words or diagrams and explain the part played by evaporation and condensation. covered optional	The Solar System is made up of the Sun and everything that orbits around it. There are eight planets in our Solar System: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Earth orbits around the Sun and a year (365.25 days) is the length of time it takes for Earth to complete a full orbit. Describe or model the movement of the planets in our Solar System, including Earth, relative to the Sun. covered x 10 optional x 3 The Moon orbits Earth, completing a full orbit every month (27.3 days). Describe or model the movement of the Moon relative to Earth. covered optional	Light travels in straight lines. Identify that light travels in straight lines. covered optional x 2 Light sources give out light. They can be natural or artificial. When light hits an object, it is absorbed, scattered, reflected or a combination of all three. Light from a source or reflected light enter the eye. Vertebrates, such as mammals, birds and reptiles, have a cornea and lens that refracts light that enters the eye and focuses it on the nerve tissue at the back of the eye, which is called the retina. Once light reaches the retina, it is transmitted to the brain via the optic nerve. Explain that, due to how light travels, we can see things because they give out or reflect light into the eye. covered x 2 optional

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Phenomena	AOL: World **Natural phenomena include weather, shadows, rainbows, clouds, flooding and waves. Name and describe natural phenomena, such as the size of shadows, the colours of a rainbow, the speed of clouds moving across the sky and the strength of a wave.** covered	A shadow is formed when light from a light source, such as the Sun, is blocked by an opaque object, but not by transparent objects. Explain in simple terms how shadows are formed. Assign	When an instrument is played by plucking, striking or blowing, the air around or inside it vibrates. These vibrations travel as a sound wave to the ear. Explain in simple terms how sounds are made. Assign	**Dark is the absence of light and we need light to be able to see. Describe the differences between dark and light and how we need light to be able to see.** covered optional **A shadow is formed when light from a light source, such as the Sun, is blocked by an object. Opaque objects cast dark shadows. Translucent objects cast pale shadows. Transparent objects cast very pale shadows. Explain, using words or diagrams, how shadows are formed when a light source is blocked by an opaque object.** covered x 2	**When an instrument is played, the air around or inside it vibrates. These vibrations travel as a sound wave. Sound waves travel through a medium, such as air or water, to the ear. Explain how sounds are made and heard using diagrams, models, written methods or verbally.** covered x 4	**The Sun, Earth, Moon and the planets in our solar system are roughly spherical. All planets are spherical because their mass is so large that they have their own force of gravity. This force of gravity pulls all of a planet's material towards its centre, which compresses it into the most compact shape – a sphere. Describe the Sun, Earth and Moon as approximately spherical bodies and use this knowledge to understand the phases of the Moon and eclipses.** covered x 3 optional	**'White' light is a term used to describe visible, ordinary daylight. White light can be split into a spectrum of colours (rainbow) by droplets of water or prisms. Describe, using scientific language, phenomena associated with refraction of light.** covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Forces	AOL: World Some objects float and others sink. When an object sinks it falls through water to the bottom of the vessel. An object that floats stays at the water's surface. Describe, predict and sort things that float and sink and talk about the forces that they can feel. covered x 2 optional	Simple equipment can be used for measuring weather, such as measuring temperature with a thermometer; identifying wind direction and force with a windsock or measuring rainfall with a rain gauge. Investigate weather using toys, models or simple equipment. covered x 4 optional x 2	Some objects float and others sink. Objects that float are typically light or hollow. Objects that sink are typically heavy or dense. Sort and group objects that float and sink. covered	An object will not move unless a pushing or pulling force is applied. Some forces require direct contact, whereas other forces can act at a distance, such as magnetic force. Explain that an object will not move unless a push or pull force is applied, describing forces in action and whether the force requires direct contact or whether the force can act at a distance (magnetic force). covered x 3	A series circuit is a simple loop with only one path for the electricity to flow. A series circuit must be a complete loop to work and have a source of power from a battery or cell. Predict and describe whether a circuit will work based on whether or not the circuit is a complete loop and has a battery or cell. covered	Gravity is a force of attraction. Anything with a mass can exert a gravitational pull on another object. The Earth's large mass exerts a gravitational pull on all objects on Earth, making dropped objects fall to the ground. Explain that objects fall to Earth due to the force of gravity. covered optional	Voltage is measured in volts (V) and is a measure of the difference in electrical energy between two parts of a circuit. The bigger the voltage, the more electrons are pushed through the circuit. The more voltage flowing through a lamp, buzzer or motor, the brighter the lamp, the louder the buzzer and the faster the motor. Explain how the brightness of a lamp or volume of a buzzer is affected by the number and voltage of cells used in a circuit. covered

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	Modelling	AOL: World Some light sources need electricity or batteries to work, such as a torch, and some do not, such as candles. Explore and describe electrical and non-electrical light sources. covered	Electrical circuits can light lamps or sound a buzzer. A switch turns an electrical circuit off and on. Describe, following exploration, what simple electrical circuits can do. Assign	Models can have moving parts that use levers, sliders, wheels and axles. Make models with moving parts. covered x 3	Make working models with simple mechanisms or electrical circuits. covered	Electrical components include cells, wires, lamps, motors, switches and buzzers. Switches open and close a circuit and provide control. Construct operational simple series circuits using a range of components and switches for control. covered x 3 optional	Mechanisms, such as levers, pulleys and gears, give us a mechanical advantage. A mechanical advantage is a measurement of how much a simple machine multiplies the force that we put in. The bigger the mechanical advantage, the less force we need to apply. Describe and demonstrate how simple levers, gears and pulleys assist the movement of objects. covered x 4 optional x 2	There are recognised symbols for different components of circuits. Create circuits using a range of components and record diagrammatically using the recognised symbols for electrical components. covered x 2

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Creativity	Report and conclude	AOL: World Represent scientific observations by mark making, drawing or creating simple charts and tables. Offer explanations for why things happen, making use of vocabulary, such as, because, then and next. covered x 6 optional x 3	The results are information that has been found out from an investigation. Talk about what they have done and say, with help, what they think they have found out. covered x 18 optional x 11	The results are information that has been found out from an investigation and can be used to answer a question. Begin to notice patterns and relationships in their data and explain what they have done and found out using simple scientific language. covered x 11 optional x 7	Results are information that has been discovered as part of an investigation. A conclusion is the answer to a question that uses the evidence collected. Use suitable vocabulary to talk or write about what they have done, what the purpose was and, with help, draw a simple conclusion based on evidence collected, beginning to identify next steps or improvements. covered x 8 optional x 8	Results are information, such as data or observations, that have been found out from an investigation. A conclusion is the answer to a question that uses the evidence collected. Use scientific vocabulary to report and answer questions about their findings based on evidence collected, draw simple conclusions and identify next steps, improvements and further questions. covered x 11 optional x 10	The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered using evidence collected. Use relevant scientific vocabulary to report on their findings, answer questions and justify their conclusions based on evidence collected, identify improvements, further questions and predictions. covered x 9 optional x 19	The results are information, such as measurements or observations, that have been collected during an investigation. A conclusion is an explanation of what has been discovered, using correct, precise terminology and collected evidence. Report on and validate their findings, answer questions and justify their methods, opinions and conclusions, and use their results to suggest improvements to their methodology, separate facts from opinions, pose further questions and make predictions for what they might observe. covered x 9 optional x 10

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Gather and record data	AOL: Maths Data can be recorded in tables and pictograms. Record data in simple tables and pictograms. Assign	Data can be recorded and displayed in different ways, including tables, pictograms and drawings. With support, gather and record simple data in a range of ways (data tables, diagrams, Venn diagrams). covered x 11 optional x 6	Data can be recorded and displayed in different ways, including tables, charts, pictograms and drawings. Use a range of methods (tables, charts, diagrams and Venn diagrams) to gather and record simple data with some accuracy. covered x 12 optional x 10	Data can be recorded and displayed in different ways, including tables, charts, graphs and labelled diagrams. Data can be used to provide evidence to answer questions. Gather and record findings in a variety of ways (diagrams, tables, charts and graphs) with increasing accuracy. covered x 8 optional x 10	Data can be recorded and displayed in different ways, including tables, charts, graphs, keys and labelled diagrams. Gather, record, classify and present observations and measurements in a variety of ways (pictorial representations, timelines, diagrams, keys, tables, charts and graphs). covered x 9 optional x 13	Data can be recorded and displayed in different ways, including tables, bar and line charts, classification keys and labelled diagrams. Gather and record data and results of increasing complexity, selecting from a range of methods (scientific diagrams, labels, classification keys, tables, graphs and models). covered x 9 optional x 3	Data can be recorded and displayed in different ways, including tables, bar and line charts, scatter graphs, classification keys and labelled diagrams. Choose an appropriate approach to recording accurate results, including scientific diagrams, labels, timelines, classification keys, tables, models and graphs (bar, line and scatter), linking to mathematical knowledge. covered x 7 optional x 9
Investigation	**Questioning**	AOL: CL Question words include who, why, what, when, where and how. Ask a relevant scientific question to find out more, explain how things work and why they might happen. covered x 7 optional x 7	Question words include what, why, how, when, who and which. Ask simple scientific questions. covered x 8	Questions can help us find out about the world. Ask and answer scientific questions about the world around them. covered x 7 optional x 3	Questions can help us find out about the world and can be answered in different ways. Ask questions about the world around them and explain that they can be answered in different ways. covered x 6	Questions can help us find out about the world and can be answered using scientific enquiry. Ask relevant scientific questions, independently, about the world around them and begin to identify how they can answer them. covered x 6 optional	Questions can help us find out about the world and can be answered using a range of scientific enquiries. Ask a wide range of relevant scientific questions that broaden their understanding of the world around them and identify how they can answer them. covered x 7 optional x 7	Questions can help us find out about the world and can be answered using a range of scientific enquiries, including fair tests, research and observation. Ask and answer deeper and broader scientific questions about the local and wider world that build on and extend their own and others' experiences and knowledge. covered x 7 optional x 4

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Measurement	AOL: World Simple equipment can be used to measure distance, height, weight and time. With support, use simple equipment, such as timers, rulers and containers, to measure length, height, capacity and time. covered optional x 3	Simple equipment is used to take measurements and observations. Examples include metre sticks, measuring tapes, egg timers and hand lenses. With support, use simple equipment to measure and make observations. covered x 9 optional x 2	Simple equipment is used to take measurements and observations. Examples include timers, hand lenses, metre sticks and trundle wheels. Use simple equipment to measure and make observations. covered x 5 optional x 3	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C) and metre sticks (millimetres, centimetres and metres). Taking repeat readings can increase the accuracy of the measurement. Take measurements in standard units, using a range of simple equipment. covered x 4 optional	Equipment is used to take measurements in standard units. Examples include data loggers plus sensors, timers (seconds, minutes and hours), thermometers (°C), and metre sticks, rulers or trundle wheels (millimetres, centimetres, metres). Take accurate measurements in standard units, using a range of equipment. covered x 3 optional x 4	Specialised equipment is used to take measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C), and measuring tapes (millimetres, centimetres, metres). Take increasingly accurate measurements in standard units, using a range of chosen equipment. covered x 6 optional	Specialised equipment is used to take accurate measurements in standard units. Examples include data loggers plus sensors, such as light (lux), sound (dB) and temperature (°C); timers (seconds, minutes and hours); thermometers (°C) and measuring tapes (millimetres, centimetres, metres). Take accurate, precise and repeated measurements in standard units, using a range of chosen equipment. covered x 7 optional

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Investigation	AOL: Exp A&D When we try things out to see if they work, it is called a test. Observe how activities are going and adapt their ideas if necessary. covered x 5 optional x 3	Simple tests can be carried out by following a set of instructions. With support, follow instructions to perform simple tests and begin to talk about what they might do or what might happen. covered x 14	Tests can be carried out by following a set of instructions. A prediction is a guess at what might happen in an investigation. Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions. covered x 9 optional x 3	Tests can be set up and carried out by following or planning a set of instructions. A prediction is a best guess for what might happen in an investigation based on some prior knowledge. Set up and carry out some simple, comparative and fair tests, making predictions for what might happen. covered x 11 optional	Scientific enquiries can be set up and carried out by following or planning a method. A prediction is a statement about what might happen in an investigation, based on some prior knowledge or understanding. A fair test is one in which only one variable is changed and all others remain constant. Begin to independently plan, set up and carry out a range of comparative and fair tests, making predictions and following a method accurately. covered x 7 optional	A method is a set of clear instructions for how to carry out a scientific investigation. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. Plan and carry out a range of enquiries, including writing methods, identifying variables and making predictions based on prior knowledge and understanding. covered x 11 optional x 2	A method is a set of clear instructions for how to carry out a scientific investigation, including what equipment to use and observations to make. A variable is something that can be changed during a fair test. A prediction is a statement about what might happen in an investigation based on some prior knowledge or understanding. Plan and carry out a range of enquiries, including writing methods, identifying and controlling variables, deciding on equipment and data to collect and making predictions based on prior knowledge and understanding. covered x 8

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Observation	AOL: World With support, observe, record and talk about materials and living things. covered x 13 optional x 22	Objects, materials and living things can be looked at and compared. Observe objects, materials, living things and changes over time, sorting and grouping them based on their features. covered x 11 optional x 4	Objects, materials and living things can be looked at, compared and grouped according to their features. Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning. covered x 9 optional x 12	An observation involves looking closely at objects, materials and living things, which can be compared and grouped according to their features. Make increasingly careful observations, identifying similarities, differences and changes and making simple connections. covered x 11 optional x 10	An observation involves looking closely at objects, materials and living things. Observations can be made regularly to identify changes over time. Begin to choose which observations to make and for how long and make systematic, careful observations and comparisons, identifying changes and connections. covered x 5 optional x 8	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time. Within a group, decide which observations to make, when and for how long, and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. covered x 4 optional x 5	An observation involves looking closely at objects, materials and living things. Accurate observations can be made repeatedly or at regular intervals to identify changes over time, identify processes and make comparisons. Independently decide which observations to make, when and for how long and make systematic and careful observations, using them to make comparisons, identify changes, classify and make links between cause and effect. covered x 6 optional x 2

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Materials	Identification and classification	AOL: World Objects are made from different materials. Everyday materials include, wood, plastic, glass, fabric, metal and stone. Materials have different properties. Name and sort everyday items into groups of the same material. covered x 2 optional x 2	A material is what an object is made from. Everyday materials include wood, plastic, glass, metal, water, rock, brick, paper and fabric. Identify and name what an object is made from, including wood, plastic, glass, metal, water and rock. covered x 4 optional	Some foods, such as ice and chocolate, melt when heated, but then harden (solidify or freeze) when cooled. Observe what happens when a range of everyday materials, including foods, are heated and cooled, sorting and grouping them based on their observations. covered	Light can be reflected from different surfaces. Some surfaces are poor reflectors, such as some fabrics, while other surfaces are good reflectors, such as mirrors. Group and sort materials as being reflective or non-reflective. covered	Materials can be grouped according to whether they are solids, liquids or gases. Solids stay in one place and can be held. Some solids can be squashed, bent, twisted and stretched. Examples of solids include wood, metal, plastic and clay. Liquids move around (flow) easily and are difficult to hold. Liquids take the shape of the container in which they are held. Examples of liquids include water, juice and milk. Gases spread out to fill the available space and cannot be held. Examples of gases include oxygen, helium and carbon dioxide. Air is a mixture of gases. Group and sort materials into solids, liquids or gases. covered x 2	Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. Compare and group everyday materials by their properties, including hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. covered x 3 optional x 2 Some materials (solutes) will dissolve in liquid (solvents) to form a solution. The solute can be recovered by evaporating off the solvent by heating. Explain, following observation, that some substances (solutes) will dissolve in liquid (solvents) to form a solution and the solute can be recovered by evaporating off the solvent. covered	Heat energy is transferred in three different ways: conduction, convection and radiation. A material that allows heat energy to travel through it is a thermal conductor. Poor thermal conductors are known as thermal insulators. Insulation is important for the survival of many animals. Blubber is a layer of fat that acts as an insulator under the skin of some animals, such as walruses and whales. It is an adaptation that is essential for their survival. Animals with fur, such as polar bears and Arctic foxes, trap a layer of air close to their skin to insulate them from the cold. Investigate and identify good thermal insulators, describing their common features. optional

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Properties and uses	AOL: World Some materials are magnetic, which means that they are attracted to (pull towards) a magnet. Some metals are magnetic. Other materials are non-magnetic, such as wood, dough and glass. Identify that materials have different properties and explore and sort magnetic and non-magnetic materials through play and exploration. covered x 2 optional	Materials have different properties, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid; waterproof or not waterproof. Investigate and describe the simple physical properties of some everyday materials, such as hard or soft; stretchy or stiff; rough or smooth; opaque or transparent; bendy or rigid and waterproof or not waterproof. covered x 3 optional x 6	A material's physical properties make it suitable for particular purposes, such as glass for windows and brick for building walls. Many materials are used for more than one purpose, such as metal for cutlery and cars. Compare the suitability of a range of everyday materials for particular uses, including wood, metal, plastic, glass, brick, rock, paper and cardboard . covered x 5 optional x 2	There are three different rock types: sedimentary, igneous and metamorphic. Sedimentary rocks form from mud, sand and particles that have been squashed together over a long time to form rock. Examples include sandstone and limestone. Igneous rocks are made from cooled magma or lava. They usually contain visible crystals. Examples include pumice and granite. Metamorphic rocks are formed when existing rocks are heated by the magma under the Earth's crust or squashed by the movement of the Earth's tectonic plates. They are usually very hard. Examples include slate and marble. Compare and group rocks based on their appearance, properties or uses. covered optional x 3 Some materials have magnetic properties. Magnetic materials are attracted to magnets. All magnetic materials are metals but not all metals are magnetic. Iron is a magnetic metal. Compare and group materials based on their magnetic	Electrical conductors allow electricity to flow through them, whereas insulators do not. Common electrical conductors are metals. Common insulators include wood, glass, plastic and rubber. Describe materials as electrical conductors or insulators. covered x 2 optional	Some mixtures can be separated by filtering, sieving and evaporating. Sieving can be used to separate large solids from liquids and some solids from other solids. Filtering can be used to separate small solids from liquids. Evaporating can be used to separate dissolved solids from liquids. Separate mixtures by filtering, sieving and evaporating. covered x 4 A material's properties dictate what it can be used for. For example, cooking pans are made from metal, which is a good thermal conductor, allowing heat to quickly transfer from the hob to the contents of the pan. Describe, using evidence from comparative or fair tests, why a material has been chosen for a specific use, including metals, wood and glass. covered x 2	Mirrors and lenses are used in a range of everyday objects (telescopes, periscopes, cards and on roads). The human eye has a lens that bends and focuses light on the back of the eye (retina) so that we can see. Describe, using diagrams, how light behaves when reflected off a mirror (plane, convex or concave) and when passing through a lens (concave or convex). covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Nature	Identification and classification	AOL: World Plants and trees are living things. They can be identified according to their features, such as leaves, seeds and flowers. Begin to name and group plants and trees according to their observable features. Assign AOL: World Animals are living things. There are different types of animal. Parent and baby mammals include cow and calf, sheep and lamb, and cat and kitten. Parent and baby birds include duck and duckling, chicken and chick, and goose and gosling. Match animals to their young. covered x 2 optional	Plants are living things. Common plants include the daisy, daffodil and grass. Trees are large, woody plants and are either evergreen or deciduous. Trees that lose their leaves in the autumn are called deciduous trees. Examples include oak, beech and rowan. Trees that shed old leaves and grow new leaves all year round are called evergreen trees. Examples include holly and pine. Identify, compare, group and sort a variety of common wild and garden plants, including deciduous and evergreen trees, based on observable features. covered x 8 Animals are living things. Animals can be sorted and grouped into six main groups: fish, amphibians, reptiles, birds, invertebrates and mammals. Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features. covered x 4 optional	A habitat is a place where a living thing lives. A microhabitat is a very small habitat. Identify and name a variety of plants and animals in a range of habitats and microhabitats. covered x 11 optional x 3 Animals have offspring that grow into adults. Different animals have different stages of growth or life cycles. Describe the basic life cycles of some familiar animals (egg, caterpillar, pupa, butterfly; egg, chick, chicken; spawn, tadpole, froglet, frog). covered x 4 optional	Some animals have skeletons for support, movement and protection. Endoskeletons are those found inside some animals, such as humans, cats and horses. Exoskeletons are those found on the outside of some animals, such as beetles and flies. Some animals have no skeleton, such as slugs and jellyfish. Identify and group animals that have no skeleton, an internal skeleton (endoskeleton) and an external skeleton (exoskeleton). covered	Scientists classify living things according to shared characteristics. Animals can be divided into six main groups: mammals, reptiles, amphibians, birds, fish and invertebrates. These groups can be further subdivided. Classification keys are scientific tools that aid the identification of living things. Compare, sort and group living things from a range of environments, in a variety of ways, based on observable features and behaviour. covered x 7 optional	Flowering plants reproduce sexually. The flower is essential for sexual reproduction. Other plants reproduce asexually. Bulbs, corms and rhizomes are some parts used in asexual reproduction in plants. Group and sort plants by how they reproduce. covered	Classification keys help us identify living things based on their physical characteristics. Use and construct classification systems to identify animals and plants from a range of habitats. covered x 2 Scientists classify living organisms into broad groups according to their characteristics. Vertebrates are an example of a classification group. There are a number of ranks, or levels, within the biological classification system. The first rank is called a kingdom, the second a phylum, then class, order, family, genus and species. Classify living things, including microorganisms, animals and plants, into groups according to common observable characteristics and based on similarities and differences. covered x 3

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Parts and functions	AOL: World Parts of plants and trees include trunk, branch, twig, roots, stem, flowers and leaves. Name and describe basic features of plants and trees. covered optional AOL: World Different animal groups have some common body parts, such as birds have wings and fish have fins. Identify common features for different groups of animals, including wild and domestic animals. covered x 8 optional x 4	The basic plant parts include root, stem, leaf, flower, petal, fruit, seed and bulb. Trees have a woody stem called a trunk. Label and describe the basic structure of a variety of common plants. covered x 2 optional Different animal groups have some common body parts, such as eyes and a mouth, and some different body parts, such as fins or wings. Label and describe the basic structures of a variety of common animals, including fish, amphibians, reptiles, birds and mammals. covered x 2	Plants need water, light and a suitable temperature to grow and stay healthy. Without any one of these things, they will die. Describe how plants need water, light and a suitable temperature to grow and stay healthy. covered x 4 optional	The plant's roots anchor the plant in the ground and transport water and minerals from the ground to the plant. The stem (or trunk) support the plant above the ground. The leaves collect energy from the Sun and make food for the plant. Flowers make seeds to produce new plants. Name and describe the functions of the different parts of flowering plants (roots, stem, leaves and flowers). covered x 2 optional x 2 Water is transported in plants from the roots, through the stem and to the leaves, through tiny tubes called xylem. Investigate how water is transported within plants. covered x 2	There are four different types of teeth: incisors, canines, premolars and molars. Incisors are used for cutting. Canines are used for tearing. Premolars and molars are used for grinding and chewing. Carnivores, herbivores and omnivores have characteristic types of teeth. Herbivores have many large molars for grinding plant material. Carnivores have large canines for killing their prey and tearing meat. Identify the four different types of teeth in humans and other animals, and describe their functions. covered	Parts of a flower include the stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal. Pollination is when the male part of a plant (pollen) is carried, by wind, insects or other animals, to the female part of the plant (carpel). The pollen travels to the ovary, where it fertilises the ovules (eggs). Seeds are then produced, which disperse far away from the parent plant and grow new plants. Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal). covered	Animals that sexually reproduce generate new offspring of the same kind by combining the genetic material of two individuals. Each offspring inherits two of every gene, one from the female parent and one from the male parent. Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent. covered x 2 Animals and plants can be bred to produce offspring with specific and desired characteristics. This is called selective breeding. Examples include cows that produce large quantities of milk or crops that are disease-resistant. Describe how animals and plants can be bred to produce offspring with specific and desired characteristics (selective breeding). covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Nutrition	AOL: World Animals eat different kinds of food, including other animals, plants or both animals and plants. Match animals to the foods that they eat. covered x 2 optional x 2	Carnivores eat other animals (meat), herbivores eat plants and omnivores eat other animals and plants. Group and sort a variety of common animals based on the foods they eat. covered x 2	Food chains show how living things depend on one another for food. All food chains start with a plant, followed by animals that either eat the plant or other animals. Interpret and construct simple food chains to describe how living things depend on each other as a source of food. covered x 5	Animals cannot make their own food and need to get nutrition from the food they eat. Carnivores get their nutrition from eating other animals. Herbivores get their nutrition from plants. Omnivores get their nutrition from eating a combination of both plants and other animals. Compare and contrast the diets of different animals. covered x 2	Food chains show what animals eat within a habitat and how energy is passed on over time. All food chains start with a producer, which is typically a green plant. The producer is eaten by a primary consumer (prey), which is eaten by a secondary consumer (prey), which is eaten by a tertiary consumer. All food chains end with a top or apex predator. Changes within a food chain, such as an abundance or lack of one food type, have an impact on the entire food chain. Construct and interpret a variety of food chains and webs to show interdependence and how energy is passed on over time. covered	Population changes in a habitat can have significant consequences for food chains and webs. Describe, using their knowledge of food chains and webs, what could happen if a habitat had a living thing removed or introduced. covered	The role of the circulatory system is to transport oxygen, water and nutrients around the body. They are transported in blood and delivered to where they are needed. Explain that the circulatory system in animals transports oxygen, water and nutrients around the body. covered x 2 optional x 3

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	Survival	AOL: World Plants and animals are living things. Plants need water, sunlight and air to survive. Animals need food, water, air and shelter to survive. Describe some ways that plants or animals should be cared for in order for them to survive. covered x 3 optional x 3	Living things need to be cared for in order for them to survive. They need water, food, warmth and shelter. Describe how to care for plants and animals, including pets. covered x 3 optional	Animals need water, food, air and shelter to survive. Their habitat must provide all these things. Explain how animals, including humans, need water, food, air and shelter to survive. covered x 9 optional x 3	Plants need air, light, water, minerals from the soil and room to grow, in order to survive. Different plants have different needs depending on their habitat. Examples include cacti, which need less water than is typical, and ferns, which can grow in lower light levels. Describe the requirements of plants for life and growth (air, light, water, nutrients and room to grow) and how they vary from plant to plant. covered optional x 3	An adaptation helps an animal or plant survive in its habitat. If living things are unable to adapt to changes within their habitat, they are at risk of becoming extinct. Explain how adaptations help living things to survive in their habitat. optional	Reproduction is the process of producing offspring and is essential for the continued survival of a species. There are two types of reproduction: sexual and asexual. Sexual reproduction involves two parents (one female and one male) and produces offspring that are different from the parents. Asexual reproduction involves one parent and produces offspring that is identical to the parent. Describe the life process of reproduction in some plants and animals. covered x 2	An adaptation is a physical or behavioural trait that allows a living thing to survive and fill an ecological niche. Adaptations evolve by natural selection. Favourable traits help an organism survive and pass on their genes to subsequent generations. Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution. covered x 4

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place and space	Habitats	AOL: World A habitat is a place where living things live. Local habitats include woodlands, gardens and ponds. Other habitats include hot places, such as deserts, and cold places, such as the Arctic. Observe and describe living things and their habitats within the local environment. covered x 6 optional	The local environment is a habitat for living things and can change during the seasons. Observe the local environment throughout the year and ask and answer questions about living things and seasonal change. covered x 2 optional	Local habitats include parks, woodland and gardens. Habitats beyond the locality include beaches, rainforests, deserts, oceans and mountains. All living things live in a habitat to which they are suited and it must provide everything they need to survive. Describe a range of local habitats and habitats beyond their locality (beaches, rainforests, deserts, oceans and mountains) and what all habitats provide for the things that live there. covered x 7	Environments are constantly changing due to natural influences, such as seasons, extreme weather, population changes and availability of food. Living things must adapt to these changes in order to survive. Describe how environments can change due to natural influences and how living things need to be able to adapt to these changes. Assign	Humans can affect habitats in negative ways, such as littering, pollution and land development, or positive ways, such as garden ponds, bird boxes and wildflower areas. Describe how environments can change due to human and natural influences and the impact this can have on living things. covered x 2 optional	Farming in the UK can be divided into three main types: arable (growing crops), pastoral (raising livestock), mixed (arable and pastoral). Intensive farming in the past has resulted in the loss of habitats. Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats. covered x 2	Living things are classified into groups, according to common observable characteristics and based on similarities and differences. Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system. covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Comparison	Physical things	AOL: World Objects can be compared and grouped according to their shape, colour, material or use. Compare and group objects and materials according to simple given criteria. covered x 2 optional	Materials can be grouped according to their properties. Compare and group materials in a variety of ways, such as based on their physical properties; being natural or man-made and being recyclable or non-recyclable. covered x 3 optional x 2	Living things are those that are alive. Dead things are those that were once living but are no longer. Some things have never been alive. Compare and group things that are living, dead or have never been alive. covered x 2	Magnets have two poles (north and south). Opposite poles (north and south) attract each other, while like poles (north and north, or south and south) repel each other. Investigate and compare a range of magnets (bar, horseshoe and floating) and explain that magnets have two poles (north and south) and that opposite poles attract each other, while like poles repel each other. covered x 2 optional	Electricity is a type of energy. It is used to power many everyday items, such as kettles, computers and televisions. Electricity can also come from batteries. Batteries eventually run out of power and need to be recycled or recharged. Batteries power devices that can be carried around, such as mobile phones and torches. Compare common household equipment and appliances that are and are not powered by electricity. covered	A life cycle is the series of changes in the life of a living thing and includes these basic stages: birth, growth, reproduction and death. Mammals' life cycles include the stages: embryo, juvenile, adolescent and adult. Amphibians' life cycles include the stages: egg, larva (tadpole), adolescent and adult. Some insects' (butterflies, beetles and bees) life cycles include the stages: egg, larva, pupa and adult. Birds' life cycles include the stages: egg, baby, adolescent and adult. Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird. covered x 5 optional	Environmental factors can affect the distribution of living things within a habitat. These factors include light (intensity and duration), weather, altitude, soil type and humans, such as when we mow or trample grass. Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered location or well-trodden path vs unused area). Assign

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	Phenomena	AOL: World A shadow is the same shape as the object that makes it. Shadows change during the day. Make a shadow bigger or smaller using toys, play equipment and a light source. covered x 4	Shadows are normally the same shape as the object that cast them. Shadows change during the day as the Sun appears to change position in the sky. Shadows occur where light is blocked by an opaque object. Compare shadows made by different objects and materials. optional	Volume is how loud or quiet a sound is. Pitch is how high or low a sound is. Compare the volume and pitch of sounds made by instruments, their voices or other objects. Assign	Friction is a force between two surfaces as they move over each other. Friction slows down a moving object. Smooth surfaces usually generate less friction than rough surfaces. Compare how objects move over surfaces made from different materials. covered optional	Sounds are louder closer to the sound source and fainter as the distance from the sound source increases. Compare how the volume of a sound changes at different distances from the source. covered	Friction, air resistance and water resistance are forces that oppose motion and slow down moving objects. These forces can be useful, such as bike brakes and parachutes, but sometimes we need to minimise their effects, such as streamlining boats and planes to move through water or air more easily and using lubricants and ball bearings between two surfaces to reduce friction. Compare and describe, using a range of toys, models and natural objects, the effects of water resistance, air resistance and friction. covered x 4 optional x 2	A circuit needs a power source, such as a battery or cell, with wires connected to both the positive and negative terminals. Other components include lamps, buzzers or motors, which an electric current passes through and affects a response, such as lighting a lamp or turning a motor. When a switch is open, it creates a gap and the current cannot travel around the circuit. When a switch is closed, it completes the circuit and allows a current to flow all the way around it. Compare and give reasons for variations in how components in electrical circuits function (brightness of lamps; volume of buzzers and function of on or off switches). covered

Big idea	Aspect	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Change	Living things	AOL: World Living things change over time. This includes growth and decay. Explore the natural world around them and give simple descriptions, following observation, of changes. covered x 3 optional x 4	All living things (plants and animals) change over time as they grow and mature. Describe, following observation, how plants and animals change over time. covered x 4 optional	Plants grow from seeds and bulbs. Seeds and bulbs need water and warmth to start growing (germinate). As the plant grows bigger, it develops leaves and flowers. Observe and describe how seeds and bulbs change over time as they grow into mature plants. covered x 4	Flowers are important in the life cycle of flowering plants. The processes of a plant's life cycle include germination, flower production, pollination, seed formation and seed dispersal. Insects and the wind can transfer pollen from one plant to another (pollination). Animals, wind, water and explosions can disperse seeds away from the parent plant (seed dispersal). Draw and label the life cycle of a flowering plant. covered optional	Habitats change over time, either due to natural or human influences. Natural influences include extreme or unseasonable weather. Human influences include habitat destruction or pollution. These changes can pose a risk to animals and plants that live in the habitat. Explain how unfamiliar habitats, such as a mountain or ocean, can change over time and what influences these changes. covered	Humans go through characteristic stages as they develop towards old age. These stages include baby, infant, toddler, child, adolescent, young adult, adult and senior citizen. Puberty is the transition between childhood and adulthood. Describe the changes as humans develop from birth to old age. covered x 3 optional x 3	Scientists compare fossilised remains from the past to living species that exist today to hypothesise how living things have evolved over time. Humans and apes share a common ancestry and evidence for this comes from fossil discoveries and genetic comparison. Explain that living things have changed over time, using specific examples and evidence. covered x 2

Science specific vocabulary

EYFS & Year 1&2

Working scientifically	***Plants***	***Animals (including humans)***	***Everyday materials and uses***	***Seasonal change***	***Living things and their habitats***
Question answer equipment gather measure results sort group test observe compare describe similar different patterns identify data classify results	*Deciduous evergreen leaves flowers (blossom) petals roots fruit bulb seed trunk branches stem water light growth temperature*	*Fish reptile mammals birds amphibian herbivore omnivore carnivore leg arm elbow head ear nose back wings beak survival water air food adult baby offspring kitten calf puppy exercise hygiene*	*Wood plastic glass paper water metal rock hard soft bendy rough smooth stretchy stiff shiny dull waterproof absorbent opaque transparent brick fabric squashing twisting elastic foil*	*Sumer spring autumn winter sun day moon night light dark*	*Living dead habitat energy food chain predator prey woodland pond desert*

Year 3 & 4

<table>
<tr>
<td rowspan="2">Working scientifically
Previous vocabulary +

Scientific enquiry changes over time secondary sources comparative tests fair tests accurate observations record evidence keys bar charts tables conclusions predictions support thermometers decrease increase relationships appearance</td>
<td>Plants
Previous vocabulary +

Air nutrients soil preproduction transportation dispersal pollination</td>
<td rowspan="2">Animals (including humans)

Movement muscles bones skull nutrition skeletons mouth tongue teeth oesophagus stomach small intestine large intestine canine incisor molar herbivore omnivore carnivore</td>
<td>Rocks

Fossils soils sandstone granite marble pumice crystals absorbent</td>
<td>Light

Light shadows mirror reflective dark reflection</td>
<td>Forces and magnets

Magnetic force contact attract repel friction poles push pull</td>
</tr>
<tr>
<td>Living things and their habitats

Living dead habitat energy food chain predator prey woodland pond desert</td>
<td>States of matter

Solid liquid gas evaporation condensation particles temperature freezing heating</td>
<td>Sound

Volume vibration wave pitch tone speaker</td>
<td>Electricity

Cells wires bulbs switches buzzers battery circuit series conductors insulators</td>
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Year 5 & 6

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<tr>
<td rowspan="2">Working scientifically
Previous vocabulary +

Independent variable dependent variable controlled variable accuracy precision classification keys scatter graphs line graphs opinion fact</td>
<td>Living things and their habitats
Previous vocabulary +

Mammal reproduction insect amphibian bird offspring classification vertebrates invertebrates micro-organisms reptiles</td>
<td rowspan="2">Animals (including humans)

Foetus embryo womb gestation baby toddler teenager elderly growth development puberty circulatory heart blood vessels veins arteries oxygenated deoxygenated valve exercise respiration</td>
<td>Properties and change of materials

Hardness solubility transparency conductivity magnetic filter evaporation dissolving mixing</td>
<td>Earth and Space

Earth sun moon axis rotation day night phases of the moon star constellation</td>
<td>Forces

Air resistance water resistance friction gravity newton pulleys gears</td>
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<td></td>
<td>Evolution and inheritance

Fossils adaptation evolution characteristics reproduction genetics</td>
<td>Light

Refraction reflection light spectrum rainbow colour</td>
<td>Electricity

Cells wires bulbs switches buzzers battery circuit series conductors insulators amps volts</td>
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