Gladstone Road Primary School Science

Curriculum Planning

Our **intent** for Science is that every child develops an
enthusiasm and enjoyment of scientific learning and discovery. Science is an integral part of all learning. As one of the core subjects we give the teaching and learning of Science the profile it requires. Children have individual Science books, a working wall in the classroom to scaffold and support their learning and displays in the corridors to celebrate learning and achievement.

Our **intent** is for children to: 501 501 2 2

- Develop understanding of the nature, processes and methods of Science through the five different types of enquiries
- Achieve their absolute potential by having the highest expectations of their learning
- Be confident to ask questions, take risks and extend their scientific knowledge
- Develop the essential scientific enquiry skills to deepen their scientific knowledge
- Use a range of methods to communicate their scientific information and present it in a systematic, scientific manner.
- Develop a respect for the materials and equipment they handle with regard to their own, and other children's safety.
- Develop Science Capital to understand the importance of Science in today's world and inspire them for their future.

We **implement** our Science approach through:

- In EYFS, we implement science through enhancing provision for children to explore scientific concepts such as melting, freezing, floating and sinking. Enquiry Areas are supported by teacher input, as well as children's independence to choose ways to investigate and promote their curiosity. In EYFS, we encourage outside visitors to come and speak to the children to promote opportunities for awe and wonder!
- Science is taught for one afternoon a week through focus groups and challenges
- Each of the 5 types of enquiry (Research, Comparative and Fair Tests, Pattern Seeking, Grouping and Classifying, Observing Over Time) is taught at least once every term.
- Working walls reflect what is being taught, vocabulary, relevant diagrams, photos and display the 5 types of science enquiry characters
- Books that are high quality and show a range of evidence. Teachers have the highest expectations and children are proud of their work!
- Regular practical experiments focusing on scientific enquiry
- A creative and innovative approach using a range of high quality resources and teaching methods
- Excellent teacher subject knowledge and high order questioning
- Excellent nurture and relationships between teacher and children allow them to take risks in their learning, allowing all children opportunities to access Greater Depth learning
- Working scientifically skills are embedded into every lesson to ensure these skills are being developed throughout
- Learning across the curriculum is sequentially planned to build on knowledge and skills

The National Curriculum and the North Yorkshire NySol scheme, provides a structure and skills development for the Science curriculum being taught.

The **impact** of our Science approach is children are inspired to demonstrate their scientific knowledge and skills. They are curious to find out how?

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KS1-Y1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge (Retrieval)						
Working Scientifically (Skills to be taught throughout the year)	**PLAN**		**DO**		**REVIEW**	
	With help and encouragement, ask simple questions that begin with why, what if, how or when.	*Make suggestions about how to do things when they plan a simple test*	With help, use simple equipment and non-standard units to find things out. Observe using the senses	With help, can gather and record data to help answer questions.	Talk about what happened and/or what was seen.	Talk about what they did
Y1 Substantive	<u>Seasonal Changes</u> Observe changes across the four seasons *Observe and describe weather associated with the seasons and how day length varies					

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Knowledge							
	Mterials L1- distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock L2 - identify objects that are made using multiple materials. L3 - Compare and group together a variety of materials based on their properties. L4 – Describe the simple physical properties of a variety everyday materials	Materials L1- distinguish between an object and the material from which it is made identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock L2 - identify objects that are made using multiple materials. L3 - Compare and group together a variety of materials based on their properties. L4 – Describe the simple physical properties	Animals including Humans. - L1 - identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense L2 – Seasonal changes Observe changes across the four seasons- with a focus on Autumn *Observe and describe weather associated with the seasons and how day length varies L3 - Say which part of the body is associated with each sense. I can record observations and outcomes. L4 -	Animals identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - identify and name a variety of common animals that are carnivores, herbivores and omnivores - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammal	Animals identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals - identify and name a variety of common animals that are carnivores, herbivores and omnivores - describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	Plants - identify and describe the basic structure of a variety of common flowering plants, including trees identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	Plants - identify and describe the basic structure of a variety of common flowering plants, including trees Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

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	L5 - Record and communicate findings in a range of ways and begin to use scientific language	of a variety everyday materials L5 - Record and comL4 - Observe changes across the four seasons. ate findings in a range of ways and begin to use scientific language		s, including pets)				
			Plants - identify and describe the basic structure of a variety of common flowering plants, including trees	Plants - identify and describe the basic structure of a variety of common flowering plants, including trees identify and name a variety of common wild and garden plants, including deciduous and evergreen trees		Materials describe the simple physical properties of a variety of everyday materials compare and group together a variety of everyday materials on the basis of their simple physical properties		
Future Learning								

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Enrichment Activities (e.g.visitors /visits)		Visit to Oliver's Mount		
Materials Vocabulary	Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through			
Animals, including humans Vocabulary	Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue, (testicles, vulva – from joint ASE and PHSE Association document) Head, body, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group N.B. The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics. The children also do not need to use the words carnivore, herbivore and omnivore. If they do, ensure that they understand that carnivores eat other animals not just meat.			
Plants Vocabulary	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area Names of garden and wild flowering plants in the local area.			
Seasonal Changes Vocabulary	Weather (sunny, rainy, windy, snowy etc.) , Seasons (winter, summer, spring, autumn), Sun, sunrise, sunset, Day length			
Working scientific	Question, look, group, sort, table, draw, chart,			

ally Vocabulary						
National Curriculum	**Everyday Materials** Pupils should be taught to: *Distinguish between an object and the material from which it is made *Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock *Describe the simple physical properties of a variety of everyday materials *Compare and group together a variety of everyday materials on the basis of their simple physical properties	**Animals, including humans** Pupils should be taught to: *Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals *Identify and name a variety of common animals that are carnivores, herbivores and omnivores *Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) *Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense				
	Seasonal Changes (throughout the year) Pupils should be taught to: • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies					

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KS1- Y2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge **(Retrieval)**	*identify and name a variety of common animals that are carnivores, herbivores and omnivores *Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	*Distinguish between an object and the material from which it is made *Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock *Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties.	*identify and name a variety of common animals that are carnivores, herbivores and omnivores *Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense .		*Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees *Identify and describe the basic structure of a variety of common flowering plants, including trees	
Working Scientifically **(Skills to be taught throughout the year)**	**PLAN**		**DO**		**REVIEW**	
	Ask simple questions and recognise these questions can be answered in different ways.	Decide with help, what to find out, observe or measure.	Observe closely, using simple equipment *and non-standard units*. Identify and classify Perform a simple test.	Gather data and record data to help answer questions. Record what has been found out using e.g. words or pictures, tables or simple prepared formats.	Use observations and ideas to suggest answers to questions	Talk about how I found out what I found out.
Y2 Substantive Knowledge	<u>Living things and their habitats</u> - identify and name a variety of plants and animals in their habitats, including micro-habitats	<u>Uses of everyday materials</u> - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	<u>Animals Including Humans</u> - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - find out about and describe the basic needs of animals,	<u>Animals Including Humans</u> - describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene - find out about and describe the basic needs of animals,	<u>Plants</u> **Knowledge and skills to be developed** - observe and describe how seeds and bulbs grow into mature plants find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	Revision as needed

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		- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	including humans, for survival (water, food and air)	including humans, for survival (water, food and air)		
Materials Vocabulary	Materials – wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber Properties – rough/smooth, flexible/rigid, strong/weak reflective/non-reflective, transparent/translucent/ opaque Changing Shape - squashing, bending, twisting and stretching, pushing and pulling					
Animals, including humans Vocabulary	Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)					
Plants Vocabulary	As for year 1 plus - light, shade, sun, warm, cool, water, grow, healthy, (Yr 1 Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in the local area Names of garden and wild flowering plants in the local area.					
Living Things Vocabulary	Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland etc., names of micro-habitats e.g. under logs, in bushes etc.					
Working scientifically Vocabulary	Questioning, observe, record, identify, group, classify, predict, diagram, label, chart, bar chart, table, data.					
National Curriculum	**Living things and their habitats** Pupils should be taught to: *Explore and compare the differences between things that are living, dead, and things that have never been alive	**Everyday Materials** Pupils should be taught to: *Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper	**Animals, including humans** Pupils should be taught to: *Notice that animals, including humans, have offspring which grow into adults *Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) *Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	**Plants** Pupils should be taught to: *Observe and describe how seeds and bulbs grow into mature plants *Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy		

	*Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other *Identify and name a variety of plants and animals in their habitats, including microhabitats *Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food	and cardboard for particular uses *Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching		

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Lower KS2 - Y3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge **(Retrieval)**	*Distinguish between an object and the material from which it is made *Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock *Describe the simple physical properties of a variety of everyday materials *Compare and group together a variety of everyday materials on the basis of their simple physical properties *Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	*Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	*Notice that animals, including humans, have offspring which grow into adults *Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) *Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	* Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	*Observe and describe how seeds and bulbs grow into mature plants *Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	
Working Scientifically **(Skills to be taught throughout the year)**	PLAN		DO		REVIEW	
	Ask questions and recognise that there are different types of enquiry.	Set up a simple practical enquiry and begin to understand how to make a test fair	Begin to make systematic and careful observations.	Gather data and use a pre-prepared table Record data.	Use results when talking about what happened.	Talk about what went wrong Suggest ideas about what else could be found out.
				With help, present data		

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		Make suggestions about what observations and measurements to make and what equipment is need. With help use information sources provided to find things out.	sometimes using standard units.	Record finding using a drawing and/or words.			
Y3 **Substantive Knowledge**	*Rocks and soils* ***Knowledge and skills to be developed*** *Compare and group different rocks based on their properties.* *Describe how fossils are formed when living things are trapped in rocks.* *Recognise that soils are made from rocks and organic matter.*	*Forces and Magnets* ***Knowledge and skills to be developed*** *Compare how things move on different surfaces.* *Notice that some forces need contact but magnetic forces act at distance.* *Observe how magnets repel and attract and attract some materials but not others* *Compare and group materials based on if they are attracted to a magnet, identify magnetic materials.* *Describe magnets as having two poles.* *Predict whether two magnets will repel or attract, depending on which poles are facing.*	*Animals, Including humans (DT Link)* ***Knowledge and skills to be developed*** *Identify that animals and humans need the right type and amount of nutrition from the food they eat.* *Identify that animals and humans have skeletons and muscles for support protection and movement* .	*Light* ***Knowledge and skills to be developed*** *Recognise that we need light to see and dark is the absence of light.* *Light reflects from surfaces.* *Light from the sun is dangerous.* *How shadows are formed* *Find patterns in the way that the size of shadows change.*	*Plants (DT Link)* ***Knowledge and skills to be developed*** *Name and describe the functions of root, stem, leaves and flowers.* *Explore the requirements for life and growth.* *Investigate how water is transported.* *Life cycle of flowering plant – pollination, seed formation and dispersal.*	*Revision of previous units*
Rocks and soils Vocabulary (Materials)	Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil						
Forces and Magnets Vocabulary	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole						

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Animals, including humans Vocabulary	Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints					
Plants Vocabulary	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal					
Light Vocabulary	Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous					
Working Scientifically Vocabulary	Sensible questions, predict, observation, research, fair test, accurate, measure, classify, diagrams, graphs, tables, charts, conclusion, explain					
National Curriculum	Pupils should be taught to: *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	Pupils should be taught to: *Compare how things move on different surfaces *Notice that some forces need contact between 2 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 2 poles *Predict whether 2 magnets will attract or repel each other,	Pupils should be taught to: *Identify that animal, 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	Pupils should be taught to: *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 changes	Pupils should be taught to: *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, seed formation and seed dispersal	

		depending on which poles are facing				

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Lower KS2 Y4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge **(Retrieval)**	*identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		*Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses *Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching		*Identify that animal, 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	*Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
Working Scientifically **(Skills to be taught throughout the year)**	PLAN		DO		REVIEW	
	Ask relevant questions and use different types of scientific enquiries to answer them.	Set up simple practical enquiries, comparative or fair tests Decide what observations and measurements to make and what equipment to use.	Use a range of equipment (including thermometers and dataloggers). Make systematic and careful observations and take accurate measurements using standard units. Use information sources provided to find things out	Gather, record and classify data in a variety of ways to help answer questions. Record findings using simple scientific language, tables, drawings and labelled diagrams.	Present data in a variety of ways *using e.g. Venn diagrams,* bar charts, *simple scatter graphs and* keys.	Use results to draw simple conclusions and make predictions for new values. Communicate what has been found out using straightforward scientific ideas and report findings using oral and written explanations and displays.	Suggest improvements to the way an enquiry is carried out. Suggest further questions to investigate.

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Y4 Substantive Knowledge	Sound **Knowledge and skills to be developed** How sounds are made, associating them with something vibrating. Vibrations from sound travel through a medium to the ear. Find patterns between the pitch of a sound and features of the object that produced it. Sounds gets fainter as the distance from the source increases.	Electricity **Knowledge and skills to be developed** Identify appliances that run on electricity. Construct simple circuits, naming parts, cells, wires, bulbs, switches and buzzers. In a simple circuit identify if the lamp will light. Switches open and close a circuit and associate this with whether or not a lamp will light. Recognise common conductors and insulators and associate metals with being good conductors.	States of matter. **Knowledge and skills to be developed** *Compare and group materials together, according to whether they are solids, liquids or gases *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	Animals, including humans **Knowledge and skills to be developed** Describe the simple functions of the basic parts of the digestive system in humans. 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.	Living Things and their habitats **Knowledge and skills to be developed** Living things can be grouped in a variety of ways. Use classification keys to group and identify living things in the local and wider environment. Recognise that environment can change and this can pose danger to living things.
Sound Vocabulary	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation				
Electricity Vocabulary	Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol,				
States of Matter Vocabulary	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle				
Animals. Including humans Vocabulary	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, herbivore, carnivore, omnivore, producer, predator, prey, food chain				
Living Things and their habitats Vocabulary	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate				

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Working Scientifically Vocabulary	Relevant questions, predication, plan, observations, record, research, enquiry, comparative, precise, thermometer, data logger, classify, keys, charts, graphs, conclusion, explanations.				
National Curriculum	Pupils should be taught to: *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	Pupils should be taught to: *Identify common appliances that run on electricity *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	Pupils should be taught to: *Compare and group materials together, according to whether they are solids, liquids or gases *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	Pupils should be taught to: *Describe the simple functions of the basic parts of the digestive system in humans *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	Pupils should be taught to: *Recognise that living things can be grouped in a variety of ways *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

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Upper KS2 Y5	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge (Retrieval)	*Compare and group materials together, according to whether they are solids, liquids or gases *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		From Y1 Seasonal changes *Observe changes across the four seasons *Observe and describe weather associated with the seasons and how day length varies.	*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 *Predict whether two magnets will attract or repel each other, depending on which poles are facing	*Describe the simple functions of the basic parts of the digestive system in humans. *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.	*Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
Working Scientifically (Skills to be taught throughout the year)	**PLAN**		**DO**			**REVIEW**		
	Ask relevant questions (containing scientific knowledge and understanding) and with help recognise which type of enquiry is best to answer a question.	*Decide what observations and measurements to make (controlling variables with help where necessary) and what equipment to use to make measurements and observations.*	*Use a range of equipment independently.* *Take a series of observations and measurements that are*	*Gather and record non-complex results (data and observations) using e.g., tables and scientific diagrams.*	Present results (data and observations) in a range of formats e.g. bar and line graphs, simple	*Draw conclusions from data and observations.* *Begin to use basic scientific evidence to support or*	*Look at results and decide if any observations or measurements are unsuitable.*	Use what has been found out to suggest improvements to work, giving reasons.

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			adequate for the task *Use information sources provided to find things out.* *Identify possible risks to themselves and others.*		scatter graphs, key and frequency charts	*refute the ideas or arguments for a conclusion.*		Set up further questions to investigate
Y5 **Substantive Knowledge**	Properties and changes of Materials **Knowledge and skills to be developed** Compare and group material on the basis of their properties, including hardness, solubility, transparency, conductivity and responses to magnets. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including sieving, filtering and evaporating. Give reasons based on comparative and fair test, for particular uses of materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible Some changes result in the formation of a new material, and are not reversible.		Earth and Space **Knowledge and skills to be developed** Describe the movement of the earth and other planets relative to the sun. Describe the movement of the moon relative to earth. Describe the sun, earth and moon as spherical bodies. Use the ideas about the earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Forces **Knowledge and skills to be developed** Explain that unsupported objects fall towards earth because of gravity acting between earth and the 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 greater effect.	Animals, Including humans **Knowledge and skills to be developed** Describe the changes as humans develop to old age.		Living things and their habitats. **Knowledge and skills to be developed** Describe the differences in lifecycles of mammals, amphibians, insects and birds. Describe the life process of reproduction in some plants and animals.
Materials Vocabulary	thermal/electrical insulator/conductor, thermal conductivity, burning, melting, solid, liquid, gas, dissolve, solution, soluble, change of state, mixture, insoluble, filter, sieve reversible/non-reversible change, rusting, new material							
Earth and Space Vocabulary	Earth, Sun, Moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune Spherical, Solar system, rotates, star, orbits, planets, axis							
Forces Vocabulary	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears							

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Animals, including humans Vocabulary	Puberty, the vocabulary to describe a range of sexual characteristics (Taken from joint ASE/PSHE Ass briefing) gestation period, pregnancy, live birth, sexual reproduction, sperm, ovum, internal fertilisation, external fertilisation, egg				
Living Things and their Habitats Vocabulary	Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings				
Working Scientifically Vocabulary	Predication, plan, change variables, observations, record, identify, comparative, precise, scientific diagrams, classification keys, present, Graphs (line and bar), interpret, evidence, conclusions, patterns.				
National Curriculum	Pupils should be taught to: *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, sieving and evaporating *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	Pupils should be taught to: *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	Pupils should be taught to: *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	Pupils should be taught to: *Describe the changes as humans develop to old age	Pupils should be taught to: *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

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Upper KS2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Prior Knowledge **(Retrieval)**	*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 a solid object *Find patterns in the way that the size of shadows change.	*Identify common appliances that run on electricity *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.	*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.	*Describe in simple terms how fossils are formed when things that have lived are trapped within rock *Recognise that environments can change and that this can sometimes pose dangers to living thing	*Describe the simple functions of the basic parts of the digestive system in humans *Identify the different types of teeth in humans and their simple functions	
Working Scientifically **(Skills to be taught throughout the year)**	PLAN		DO		REVIEW	
	Ask relevant questions (containing scientific knowledge and understanding). *Recognise which type of enquiry is best to answer a question*	Plan different types of science enquiries to answer questions. Recognise and control variables where necessary. *Decide what observations and measurements to make and what equipment to use (giving reasons) to*	Take measurements, using a range of scientific equipment with increasing accuracy and precision. Take repeat readings when appropriate	Record data and results of increasing complexity using e.g., scientific diagrams, labels and tables Choose a method to suit	Present data and results in suitable formats using e.g line graphs, bar graphs, scatter graphs and classification keys	From data and observations draw valid conclusions (i.e., consistent with the evidence) including causal relationships Identify scientific	*Look at results and decide if any observations or measurements are unsuitable and need to be carried out again.* *Offer simple explanations*	Use test results to make predictions to set up further enquiries e.g. comparative and fair tests *and suggest how working methods could be*

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		make measurements and observations.	Use relevant information sources to find things out Identify possible risks to themselves and others	the results, e.g., a two-column table		evidence to support or refute the ideas or arguments for my conclusion	*for differences in results*	*improved, with reasons*
Y6 Substantive Knowledge	<u>Light</u> **Knowledge and skills to be developed** *Recognise that light travels in straight lines. *Explain that object can be seen because they give out or reflect light into the eye. *Use idea that light travels in straight lines to explain why shadows have the same shape as the object that cast it.	<u>Electricity</u> **Knowledge and skills to be developed** Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in a circuit. Compare and give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.	<u>Living Things and their habitats</u> **Knowledge and skills to be developed** Describe how living things are classified into broad groups according to common characteristics and based on similarities and differences, including micro-organisms plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	<u>Evolution and Inheritance</u> **Knowledge and skills to be developed** Recognise that living things have changed overtime 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.		<u>Animals, including humans</u> **Knowledge and skills to be developed** 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.	
Light Vocabulary	*Straight lines, Light rays., fraction, angle of reflection, angle of incidence* *(Y3 vocabulary - Light, Light source, Dark, Absence of light, Transparent, Translucent, Opaque, Shiny, Matt, Surface, Shadow, Reflect, Mirror, Sunlight, Dangerous)*							
Electricity Vocabulary	voltage, variations, components, function switches, circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor							

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Living Things Vocabulary	Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, flowering and non-flowering, Classification; Linnaeus; Micro-organisms; taxonomists				
Evolution and Inheritance Vocabulary	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils				
Animals, Including humans Vocabulary	Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle				
Working Scientifically Vocabulary	Variables to change and keep same, observations, record, repeat, comparative, fair, precise, quantitive measurements, present, systematic, graphs (scatter, line, bar) patterns, interpret, explanations, relationships, refute, validity				
National Curriculum	Pupils should be taught to: *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	Pupils should be taught to: *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	Pupils should be taught to: *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	Pupils should be taught to: *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	Pupils should be taught to: *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

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	Biology		Physics		Chemistry