Otley All Saints C.E Primary School

'Learning, Love and Laughter Every Day'

Science Progression

Science Curriculum Map 2022-23							
Term		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Early Years Foundation Stage	Nursery	What makes us unique	The natural world	The natural world	Plant seeds and care for growing plants	How things work	Seaside animals Shadows
	Reception	I am Amazing	Celebrations- Light and Dark	Traditional Stories and Being Healthy	We like to travel -Space	We're going on an Adventure	Minibeasts
Key Stage 1	Year 1	Human Body & Senses	Seasonal Change	Materials	Plants Seasonal Change	Animals Seasonal Change	
	Year 2	Animals including humans: Growth and survival	Exercise, food, health and hygiene	Materials	Plants	Habitats, Adaptation Food chains	
Key Stage 2	Year 3	Forces and Magnets	Rocks & Soils	Rocks & Soils	Animals including Humans: Nutrition, skeleton and muscles	Plants	Light
	Year 4	Animals Including Humans: Digestive System and Teeth		Sound	Electricity	Living Things and their Habitats	States of Matter *(2023-2024 this unit will move to Autumn 1)*
	Year 5	Properties and changes in materials		Forces	Life Cycles	Earth and Space	Life Processes
	Year 6	Electricity	Animals including humans: Human circulation system	Evolution & Inheritance		Light	Living things & their habitats

Science Progression Summary

Science Progression of Knowledge & Skills

EYFS - Nursery & Reception

Enhanced Provision:

- The creative area, mark making areas and changing provision areas are always resourced and children have free access to the equipment in them, which encourages the children to talk about what they are learning. It gives them the opportunity to revisit their learning and apply it in different situations and also extends their learning - allowing them the chance to teach their peers.
- Provision (both indoor and outdoor) is regularly enhanced with new items so that children continue to be engaged, see examples below. These are linked to topics, or are child led based on the children's interests.
- Spontaneous opportunities arise from the children's comments and interests and are developed through talking and interacting with the children, these are resourced accordingly.
- Evidence of the children using enhanced provision in their own way can be found on Tapestry.

Term/Topic	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery:	**Myself**	**Colour, Pattern & Light**	**I am Healthy/Stories & Rhymes**	**Arctic/Antarctic**	**Where we live / People who help us**	**The Transport / The Seaside**
Examples of provision, Global Goals & enrichment*: *Not exclusive. Children's interests are responded to and learning journeys created/adapted to suit these interests.	**Outdoor/ sand/water:** exploration of found and natural materials , measuring and comparing, self portraits using natural materials, explore glow-sticks in the water, begin to understand the need to respect and care for the natural environment and all living things **Design Area:** drawing ourselves, comparing similarities and differences **Movement area:** how can I move my body? Using the spinning tubs, balance boards, stompers, movements with torches **Reading Area:** nonfiction books about my body, light and dark, nocturnal animals, stories about me, stories about animals in the dark, celebrations **Large and small construction/Loose Parts/Small World:** roleplay with figures, story characters, making homes, creating pictures of ourselves, families, pets using loose parts/construction, habitats for nocturnal animals **Role Play:** how are we the same/different? Look what I can do! looking at lights, natural/indoors/usefulness, importance of turning off power and lights, differences between day/night **Investigation:** investigate torches, exploring colour and light and patterns, using gels and plastic film, candles(festivals) explore how you can shine light through some materials and not others, nocturnal/diurnal creatures **Mark Making:** drawing ourselves, families, pets, light sources, nocturnal/diurnal animals		**Outdoor/ sand/water:** observing frost, exploring ice, frozen water, talk about the differences between materials and changes they notice (ice melting and freezing water)whilst outside and through outdoor play, begin to understand the need to respect and care for the natural environment and all living things **Design Area** snow/ice scapes, ice paintings, **Reading Area:** nonfiction books about the Arctic and Antarctic, growing seeds/plants, life cycles of plants and animals **Large and small construction/Loose Parts/Small World:** creating habitats for Arctic and Antarctic animals, explore how things work **Role Play:** role play in the ice den, role play the key features of the life cycle of a plant and an animal, planting bulbs **Investigation:** changes in materials- ice melting, water freezing, chocolate melting, materials changing when heated (pancakes, chocolate) cornflour dough, aqua beads **Mark Making:** drawing Arctic and Antarctic animals, drawing familiar animals and creatures, animals living in cold, icy places, drawing life cycles of plants/animals		**Outdoor/ sand/water:**begin to understand the need to respect and care for the natural environment and all living things, observing weather changes, spring, new life, exploration of water, floating, sinking, boats **Design Area** creating models out of recyclable materials, exploring how wind up vehicles work and move **Reading Area:** nonfiction books about the beach, sea, sealife, stories about the beach/sea **Large and small construction/Loose Parts/Small World:** small world play- the seaside, beach, **Role Play:** role play caring for life on land and sea (through seasides) recycling rubbish (linked to trip to the bottle bank)ice cream parlour **Investigation:** changes in materials- making ice lollies, pushes and pulls- vehicles down a ramp **Mark Making:** drawing seaside/beach pictures, sea life,	

Development Matters Statements (Three and four year olds)						
Communication & Language	Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"					
Personal, social & emotional development	Make healthy choices about food, drink, activity and toothbrushing.					
Understanding the world	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties .• Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.					
Reception:	**I am Amazing!**	**Celebrations Light and Dark**	**Traditional Stories- Keeping Healthy**	**We Like to Travel Space**	**We're Going on an Adventure**	**Big Beasts and Little Beasts**
Examples of provision, Global Goals & enrichment*:	**Outdoor sand/water:** capacity, measures, exploration, exploring the change in season, seeds, conkers, acorns, investigate natural processes- ice, frost, fruit decomposing to reveal the seeds, mirrors and reflections **Creation Station:** leaf pictures, printing with leaves, seed collages. **Movement area:** making sounds, shakers using seeds, balance boards, waving wands, body labels, stethoscopes, sensory objects, torches, shadow puppets **Book Nook:** Nonfiction books about me, our body, senses, famous scientists, light and dark, shadows **Large and small construction/Loose Parts/Small World**: creating self portraits using loose parts, **Role Play:** using props to recap learning, medical bag, doctor/nurse dressing up, bandages, stethoscopes, shadow puppets, torches **Mark Making:** lists of equipment, making labels to label themselves/their body parts Autumn conker walk Forest School		**Outdoor sand/water:** capacity, measures, exploration, change in season, ice and frost melting, exercise and movement outside **Creation Station:** Creating rockets, Mars Rover, Curiosity **Movement area:** ramps, stompers - forces and pressure, catapults, pushes, pulls, investigate the effects of exercise on the body using stethoscopes, sand timers and simple stopwatches, balance boards **Book Nook:** Nonfiction books about keeping healthy, space, Mars Rover, famous astronauts **Large and small construction/Loose Parts/Small World:** balance, climbing, obstacle courses, **Role Play:** using props to recap learning, changing states- link to food **Mark Making:** recording their findings, making labels, blank little books to create their own books about how to keep healthy. Children's Mental Health Week Parents with a medical background to talk about keeping healthy		**Outdoor sand/water**: investigate properties of materials, sort materials, floating/sinking/waterproof/non waterproof, wet and dry properties of materials, create habitats for minibeasts, archeological digs, sorting the recycling **Creation Station:** creating castles using materials with specific properties , creating roofs (waterproofing) **Movement area:** making instruments **Book Nook:** Nonfiction books about lifecycles, minibeasts, dinosaurs, famous scientists **Large and small construction/Loose Parts/Small World:** life cycles, creating habitats, bug hotels, archeological sites **Role Play:** Using props to recap learning, changes in state **Mark Making:** recording their findings, labels for sorting groups Hatching butterflies. Mrs Shutt's garden- Dinosaurs Minibeast walk Bolton Abbey	

	GG3 Keeping healthy	GG3- Keeping Healthy	Parent from Climate Books to read a story about Climate change- talk about how we can care for life on land. GG13: Life on Land GG 15: Climate Action
Development Matters statements (Reception)			
Communication & Language	Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.		
Personal, social & emotional development	Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian		
Understanding the world	• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live • Understand the effect of changing seasons on the natural world around them.		
Characteristics of Effective Learning:	*Children in EYFS develop their 'Characteristics of Effective Learning' through their independent learning and adult guided activities. The characteristics which show subject specific skills are documented through photographs on Tapestry. The following characteristics are seen as complementing future Science learning:* ● Realise that their actions have an effect on the world, so they want to keep on repeating them. ● Plan and think ahead about how they will explore or play with objects. ● Make independent choices. - ● Bring their own interests and fascinations into early years settings, this helps them to develop their learning. ● Respond to new experiences that you bring to their attention. ● Show goal-directed behaviour. ● Keep on trying when things are difficult. ● Sort materials. ● Solve real problems. ● Use pretend play to think beyond the 'here and now'. ● Know more, so feel confident about coming up with their own idea		
EYFS END POINTS (ELGs):	● Make comments about what they have heard and ask questions to clarify their understanding. ● Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. ● Explore the natural world around them, making observations and drawing pictures of animals and plants. ● Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. ● Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.		

Science Progression of Knowledge & Skills

KS1 - Year 1

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic:	**Human Body & Senses**	**Seasonal Change**	**Materials Y1**	**Plants Seasonal Change** (continues in summer term)	**Animals Seasonal Change**	
Prior Knowledge:	EYFS Keeping healthy	EYFS I am amazing!	EYFS We're going on an adventure!	EYFS I am amazing!	EYFS Big beasts and little beasts	
Key knowledge and skills: (N.C. objectives)	Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	Name the four seasons and discuss features of them Talk about how the seasons affect them (clothes, weather, etc) Knows when each of the four seasons occurs Know what the features of autumn are and what happens to trees in this season Knows that days are longer in summer (sunshine hours) than in winter Observe changes across the four seasons	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.	Know and can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Knows and can identify and describe the basic structure of a variety of common flowering plants, including trees Observe changes across the four seasons.	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).	Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.
Context at our school: (Examples of teaching and learning activities)	• Learn about different parts of the body using practical activities and song • Conduct simple sense experiments - Which smells can I match? - Which	• Explore clothing for different seasons/use role play • Seasonal walk/scavenger hunt in school grounds (repeat during)	• Discuss what a material is and what materials everyday objects are made from • Compare and group together a variety of everyday materials on the basis of	• Look at different parts of the plants and use art to make models and label them. • Plant seeds to identify how they grow over time (seed to	• Comparing and classifying animal groups such as mammals, reptiles... • Identify, classify and group carnivore, herbivores, omnivores	• Draw conclusions about how weather/light etc changes throughout the year • Make observations of features that change with the seasons e.g. plants,

	food/flavours can I identify by taste? -Which sounds can I identify by hearing • Which senses do we use in different circumstances (senses walk in school grounds)	• Explore how trees change in different seasons • Gather and record data about weather conditions in autumn, drawing on observation and using simple equipment (such as a simple wind sock or rain gauge) • Look at data from weather found online • Demonstrate their knowledge in different ways e.g. creating seasonal artwork and non fiction writing	their simple physical properties - Otley Sorting Facility • Test the properties of objects e.g. absorbency of different types of paper, strength of party hats made of different papers, stiffness of paper plates, waterproofness of shelters. Use their test evidence to answer questions such as 'Which paper is best for mopping up a spillage?'	seedling) and make simple observations. • Learn names of different types of garden and wild plants including their identifying features such as leaves using first hand practical experiences • Make and record observations in different ways e.g. drawings, photos, bark rubbings.	• Use sorting hoops/Venn diagrams to classify • Compare similarities and differences of animals e.g. looking at their different body parts/structure	animals (school ground hunt) • Revisit learning and make comparisons with Autumn • Gather data about weather to help answer questions and make comparisons across seasons
Working scientifically skills: (Y1 & Y2)	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					
Links to GGs/ Enrichment opportunities	GG3- keeping healthy	GG13: Life on land English (non fiction writing)		GG13: Life on land	GG13: Life on land Visit to Hesketh Park Farm	GG13: Life on land GG15: Climate action
END POINTS:	• Name and locate parts of the human body, including those related to the senses • Describe and compare the observable features of animals from a range of groups • Group animals according to what they eat • Describe seasonal changes • Distinguish objects from materials, describe their properties • Identify and group everyday materials					

Science Progression of Knowledge & Skills

KS1 - Year 2

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic:	**Animals including humans**	**Exercise, food, health, hygiene**	**Materials Y2**	**Plants Y2**	**Habitats, adaptations, food chains**	
Prior Knowledge		Year 1 Human body and senses EYFS I am amazing!	**Year 1 Materials**	Year 1 Plants seasonal change	EYFS Big beasts and little beasts Year 1 Animals seasonal change	
Key knowledge and skills: (N.C. objectives)	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Notice that animals, including humans, have offspring which grow into adults. Explore and compare the differences between things that are living, dead, and things that have never been alive.	Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	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.	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 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. 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.	
Context at our school: (Examples of teaching and learning activities)	• Ask questions and use secondary sources to find out about the life cycles of some animals • Can sort into living, dead and never lived. • Explore the outside environment to find objects	• Investigate the effect of exercise on their bodies • Describe, using diagrams, the life cycle of some animals, including humans, and their growth to adults • Measure/observe how animals, including humans, grow.	• Classify and sort materials by their properties e.g. transparent, smooth, durable etc. • Investigate which materials are fit for a purpose e.g. What is the best material for a boat?	• Make close observations of seeds and bulbs • Classify seeds and bulbs • Research and plan when and how to plant a range of seeds and bulbs • Look after the plants as they grow – watering	• Create simple food chains for a familiar local habitat from first hand observation and research • Create simple food chains from information given e.g. in picture books (Gruffalo etc.) • Discuss key features that mean the animal or plant is suited to its microhabitat • Using a food chain can explain what animals eat • Talk about, in simple terms, why an animal or plant is suited to a habitat	

	that are living, dead and have never lived • Investigate whether people with longer legs have bigger feet	• Explain how development and health might be affected by differing conditions and needs being met/not met • Explain how physical exercise can be good for physical and mental health • (NB healthy diet covered in PSHE) • Investigate whether exercise makes breathing rate increase	• Explain from their observations how materials change when a force is exerted on them by squashing, bending, twisting and stretching. • Investigate whether we can squash/twist materials • Investigate which material would make the best boat	• Make close observations and measurements of their plants growing from seeds and bulbs Make comparisons between plants as they grow • Can spot similarities and difference between bulbs and seeds • Investigate what do plants need to grow and survive	• Investigate habitats during Nell Bank trip.
Links to GGs/ Enrichment opportunities:	Science Fair	GG 3 Keeping Healthy Linked to PSHE: understanding the links between mental and physical health.	Links to history: which materials would be the best to make a boat like Shackleton's Endurance?	GG13 Climate Action GG15 Life on Land Link to writing: instruction on how to grow cress from seed.	GG 15 Life on Land GG14 Life below water Trip to Nell Bank: Habitats and Adaptations
Working Scientifically (Y1 & Y2)	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				
END POINTS:	• Describe the importance of exercise, a balanced diet and hygiene for humans • Describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults • Describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants • Identify whether things are alive, dead or have never lived • Describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships • Name different plants and animals and describe how they are suited to different habitats • Compare their suitability of materials for different uses				

Science Progression of Knowledge & Skills

KS2 - Year 3

	Autumn 1	Autumn 2	Spring (2)	Summer 1	Summer 2
Topic:	**Forces**	**Rocks and soils**	**Animals including humans (Spring 2)**	**Plants**	**Light**
Prior Knowledge	EYFS We like to travel	**Year 1** Materials Year 2 Materials	Year 2 Animals including humans Year 2 Exercise, food and health and hygiene	Year 1 Plants and seasonal change Year 2 Plants	EYFS Celebrations light and dark Year 1 Materials Year 2 Materials (properties such as reflective/opaque)
Key knowledge and skills: (N.C. objectives)	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, depending on which poles are facing	Compare and group together different kinds of rocks according to 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.	Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement	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.	Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change
Context at our school: (Examples of teaching and learning activities)	• Record and discuss findings from investigations, involving how things move on different surfaces • Compare and group materials following	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.	• Understand that foods belong to different groups • Plan a healthy packed lunch to contain a good balance of nutrients and record	• Compare edible and non edible plants to identify the similarities e.g a carrot is a root and a celery is a stem	• Use objects to block the light to form shadows and draw them • Observe and identify the difference in shadows of opaque, translucent and transparent objects/materials.

	magnetic testing, recording findings and use the outcome to answer questions about which materials are magnetic.	• May devise tests e.g. hardness test to explore the properties of rocks and use data to rank the rocks • ink rocks changing over time with their properties e.g. soft rocks get worn away more easily • Can identify plant/animal matter and rocks in samples of soil	• Find out about the parts and functions of the skeleton • Compare, contrast and classify skeletons of different animals • Compare and contrast the diets of different animals including carnivores and herbivores (including their pets) and decide ways of grouping them according to what they eat. • Understand the difference between vertebrates and invertebrates with soft bodies or exoskeletons	• Observe what happens to plants over time when flowers are put in coloured water • Investigate what happens to plants over time when they are given different amounts of water • Observe flowers carefully (dissection) to identify the different parts and present in different ways • Observe flowers being visited by pollinators e.g. bees and butterflies in the summer (Harlow Carr) • Learn about different types of seed dispersal e.g. sycamores	• Compare light sources and light reflected from surfaces • Investigate the size of shadows according to times of day by tracing shadows outside and comparing differences. • Use oral and written explanations to report on why shadows are formed and how the length and size of a shadow can be changed.
Links to GGs/ Enrichment opportunities:	Otley Science Festival	Art - observational drawing of fossils. Create fossil printing block	PSHCE - Physical Health - Keeping active and making healthy choices about food and drink. English / History democracy - Should we be able to eat any snack at morning playtime?	GG15 Life on Land Harlow Carr visit DT -Mechanisms - Moving pictures with a lever - Pollination English - Information Writing - Seed Dispersal	
Working Scientifically Skills (Y3 & Y4)	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.				
END POINTS:	• Name and describe the functions of the main parts of the musculoskeletal system • Name, locate and describe the functions of the main parts of plants, including those involved transporting water and nutrients • Describe the requirements of plants for life and growth • Describe how fossils are formed • Group and identify rocks, in different ways according to their properties, based on first-hand observation • Explain the formation and size of shadows • Describe the effects of simple forces that act at a distance (magnetic forces, including those between like and unlike magnetic poles)				

Science Progression of Knowledge & Skills

KS2 - Year 4

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic:	**Animals including humans**		**Sound**	**Electricity**	**States of matter**	**Living things**
Prior Knowledge	Year 1 Human body and senses including taste Year 2 Animals including humans and Habitats and food chains and Exercise, healthy eating and hygiene Year 3 Animals including humans		Year 1 Human body and senses including hearing	KS1 - grouping and classifying materials - link to classifying insulators/conductors	Year 1 Materials Year 2 Materials	Year 2 Habitats, adaptations, food chains
Key Knowledge/ Skills: (N.C. objectives)	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. Knows which organisms are producers, predators and prey and apply to the construction and interpretation of food chains.		Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sounds travel through a medium to the ear. Recognise that sounds get fainter as the distance from the sound source increases. 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	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 cell/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.	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. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	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.
Context at our school: (Examples of teaching and learning activities)	• Construct and interpret a variety of food chains, identifying producers, predators and prey. • May create food chains based on research. • Identifies differences, and similarities of different types of teeth according to herbivore, omnivore and carnivore. ● Can record the teeth in their mouth (make a dental record).		• Experiment with different instruments to observe and explore volume and pitch. • Make predictions and draw conclusions about sound travels through different	• Construct and investigate a range of circuits. • Investigate which materials can be used instead of wires to make a circuit . • Classify materials that conduct electricity and those that	• Classify materials according to whether they are solids, liquids and gases. • Observe a range of materials melting. • May investigate how to melt ice more quickly.	● Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.

	● Describe the journey of food through the digestive system ● Label the different parts of the digestive system Chewing experiment to explore role of enzymes in the digestive system	mediums (coat hanger ear gong) to the ear • Note how vibrations make sounds of different volumes and travel to our ears. • May make own instruments that produce a range of pitches (possible homework project)	don't, following investigation and record findings. • Apply their knowledge of conductors and insulators to make switches work in a circuit	• Research melting point of different materials. • Observe and measure temperature of icy water, tap water, hot water. • Observe water evaporating and condensing. • Set up investigations to explore changing the rate of evaporation.* • Use secondary sources to find out about the water cycle.* • Using their data, can explain what affects how quickly a solid melts. • From their data, can explain how to speed up or slow down evaporation. • Present learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet.	• Classify living things found in different habitats based on their features. ● Create a simple identification key based on observable features. ● Use research to explore human impact on the local environment e.g. litter, tree planting. ● Use secondary sources to find out about how environments may naturally change. • Visit York Birds of Prey Centre to see conservation in action. ● Use secondary sources to find out about human impact, both positive and negative, on environments and write a report on this.*
Working Scientifically Skills (Y3 & Y4)	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.				
Links to GGs/ Enrichment opportunities:	Otley Science Festival English (Writing - Journey of food through the digestive system)		GG 7 - Affordable and clean energy GG 13 - Climate Action GG 11 - Sustainable cities and communities Link to DT project in Summer Term		GG 14/15 - Life below water/Life on land GG 13 - Climate Action Visit to York Bird of Prey centre (conservation)
END POINTS:	• Name and describe the functions of the main parts of the digestive system • Construct and interpret food chains • Explain how environmental changes may have an impact on living things • Describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle • Use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard • Describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source				

Science Progression of Knowledge & Skills

KS2 - Year 5

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic:	**Properties & changes in Materials**		**Forces**	**Life Cycles**	**Earth and space**	**Life processes**
Prior Knowledge	Year 1 Materials Year 2 Materials Year 3 Forces (magnetism) Year 4 States of matter and Electricity		**Year 3 Forces**	Year 2 Habitats Year 4 Living things	EYFS We like to travel - Space **Year 3 Light**	Year 2 Animals including humans Year 3 Plants
Key Knowledge/ Skills: (N.C. objectives)	Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. 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.		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.	Know and describe the life cycles of mammals/ birds / amphibians and insects including those with metamorphosis (butterflies) Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	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. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Describe the changes as humans develop to old age (Puberty covered in PSHCE) Describe the life process of reproduction in some plants and animals.
Context at our school: (Examples of teaching and learning activities)	• Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test thermal insulation to identify a suitable fabric for a lunchbox • Explore adding a range of solids to water and other liquids • Investigate rates of dissolving by carrying out comparative and fair test and records findings		• Compare different objects mass (g) and Newtons (N) and the relationship between them ● Investigate the effects of air resistance in a range of contexts e.g. parachutes .	• Draw and label appropriate scientific diagrams following use of secondary sources and first hand observations relating to the life cycle of a range of animals. compare and contrast the life cycles of different living things and	• Use secondary sources to help create a model e.g. role play or using balls, to show the movement of the Earth around the Sun and the Moon around the Earth. • Use secondary sources to understand how night and day occur	• Observe plants that reproduce sexually/asexually • Consolidate learning from Y3 about parts of a flower • Learn about the process of pollination • Organise mammals into different groups - sea and

	● Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture ● Explore a range of non-reversible changes e.g. rusting, burning, vinegar and bicarbonate of soda/milk ● Carry out comparative and fair tests involving non-reversible changes e.g. What conditions make metal rust the quickest? ● Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton) (Possible homework)	● Research how the work of scientists such as Galileo Galilei and Isaac Newton helped to develop ideas about forces and gravity ● Explore how levers, pulleys and gears work.	present findings identify which insects complete which type of metamorphosis and present findings identify the key differences between some amphibians – for example, toads and frogs, and present findings in different forms. ● Observe the life cycle of butterflies starting with caterpillars. Release butterflies when they have emerged.	● Make first-hand observations of how shadows caused by the Sun change through the day ● Find out about other planets in our Solar System and compare to the Earth ● Consider the views of scientists in the past and how evidence was used to deduce the shapes and movements of the Earth, Moon and planets before space travel.	land and marsupials and use scientific evidence to refute/support correct/incorrect statements (such as 'dolphins are fish'). ● Use data to compare and find patterns, for example to compare the gestation times for mammals and look for patterns e.g. in relation to size of animal or length of dependency after birth/Look for patterns between the size of an animal and its expected life span)
Working Scientifically Skills (Y5 and Y6)	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments				
Links to GGs/ Enrichment opportunities:	Visit to Science Fair at Otley Courthouse GG 12 Sustainable consumption - recyclable/reusable materials	Link to explanation writing in English - Cracking Contraptions	Caterpillars/butterflies grown in class SDG 14/15 - Life below water/Life on land	Visit to Jodrell Bank Link to science fiction writing in English	SDG 14/15 - Life below water/Life on land
END POINTS:	• Describe and compare different reproductive processes and life cycles in animals • Name, locate and describe the functions of the main parts of plants, including those involved in reproduction • Group and identify materials, in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties • Identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components • Identify, with reasons, whether changes in materials are reversible or not • Describe the effects of simple forces that involve contact (air and water resistance, friction) and, that act at a distance (gravity) • Identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force • Describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night				

Science Progression of Knowledge & Skills

KS2 - Year 6

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic:	**Electricity**	**Human Circulatory System**	**Evolution & Inheritance**		**Light**	**Living things & their habitats**
Prior Knowledge	Year 4 Electricity	Year 1 Human body and senses Year 2 Exercise, food, health, hygiene Year 3 Animals including humans Year 4 Animals including humans	Year 2 Animals including humans and Habitats, adaptations, food chains Year 3 Plants and Rocks and Soils Year 4 Living things Year 5 Life processes		Year 1 Human body and senses Year 3 Light	Year 4 Living things Year 5 Life cycles
Key Knowledge/ Skills: (N.C. objectives)	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.	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.	Identify traits and adaptive traits. Understand that adaptations are random mutations. Understand what 'natural selection' is. Understand about the people that have helped us to understand about evolution. 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.		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.	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.
Context at our school: (Examples of teaching and learning activities)	• Draw circuit diagrams of a range of simple series circuits, using recognised symbols. • Communicate structures of circuits using circuit diagrams with recognised symbols		• Demonstrate an understanding, with specific examples, of how an animal or plant has evolved over time e.g. peppered moth. • Identify characteristics that will make a plant or animal suited or not suited to a particular habitat. • Compare the ideas of Charles Darwin and Alfred Wallace on evolution.		• Investigate the use of mirrors to reflect light and record using straight line diagrams to indicate the direction of light. • Use mirrors, torches and to demonstrate and record how light is reflected	• Classify plants and animals and record conclusions from the use of classification keys. • Use information about the characteristics of an

	• Make electric circuits and demonstrate, following investigation, how variation in the working of particular components can be changed. • Application of electrical circuits in the real world e.g. houses • Dangers of electricity		• Research the work of Mary Anning and understand how this provided evidence of evolution. • Referring to and using examples of fossil evidence that support the theory of evolution.	• Where possible, measure and record the angle of incidence and angle of reflection using a protractor and detailed diagram	unknown animal or plant to assign it to a group. • Use secondary sources to learn about the formal classification system devised by Carl Linnaeus and why it is important.
Working Scientifically (Y5 and Y6)	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Using test results to make predictions to set up further comparative and fair tests. Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments				
Links to GGs/ Enrichment opportunities:	GG7 Renewable energy Possible English/D.T link - design and make a light–up snow globe (link to book The Nowhere Emporium)		GG13 Climate Action History (Industrial Revolution), English Narrative Poetry (Moth) & Biographies (Mary Anning/Charles Darwin) Art - Plaster of Paris fossil moulds	GG14 Life Below Water GG15 Life On Land GG13 Climate Action GG7 Renewable energy English (explanation text about light) Computing (research about sustainable light energy sources) Maths (angles)	GG15 Life On Land GG13 Climate Action English (Non-chronological report about a living thing) Art (sketching living things)
End Points	• Describe and explain the main parts of the circulatory system • Describe the effects of diet, exercise, drugs and lifestyle on how the body functions • Use the observable features of plants, animals and microorganisms to group, classify and identify them into broad groups, using keys or other methods • Use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved and provide evidence for evolution • Use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects and the shape of shadows • Use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams				

Impact (End points) As stated in ELGs	Impact (End Points) As set out in the statutory teacher framework for the end of key stage	
Early Years Foundation Stage	**Key Stage 1**	**Key Stage 2**
Children can: • Make comments about what they have heard and ask questions to clarify their understanding. • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.	Children can: Name and locate parts of the human body, including those related to the senses [year 1], and describe the importance of exercise, a balanced diet and hygiene for humans [year 2] • Describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults [year 2] • Describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants [year 2] • Identify whether things are alive, dead or have never lived [year 2] • Describe and compare the observable features of animals from a range of groups [year 1] • Group animals according to what they eat [year 1], describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships [year 2] • Describe seasonal changes [year 1] • Name different plants and animals and describe how they are suited to different habitats [year 2] • Distinguish objects from materials, describe their properties, identify and group everyday materials [year 1] and compare their suitability for different uses [year 2]	Children can: Name and describe the functions of the main parts of the digestive [year 4], musculoskeletal [year 3] and circulatory systems [year 6]; and describe and compare different reproductive processes and life cycles in animals [year 5] • Describe the effects of diet, exercise, drugs and lifestyle on how the body functions [year 6] • Name, locate and describe the functions of the main parts of plants, including those involved in reproduction [year 5] and transporting water and nutrients [year 3] use the observable features of plants, animals and microorganisms to group, classify and identify them into broad groups, using keys or other methods [year 6] • Construct and interpret food chains [year 4] • Describe the requirements of plants for life and growth [year 3]; and explain how environmental changes may have an impact on living things [year 4] • Use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved [year 6]; and describe how fossils are formed [year 3] and provide evidence for evolution [year 6] • Group and identify materials [year 5], including rocks [year 3], in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties [year 5] • Describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle [year 4] • Identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components [year 5] • Identify, with reasons, whether changes in materials are reversible or not [year 5] • use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects [year 6], and the formation [year 3], shape [year 6] and size of shadows [year 3] • Use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard [year 4] • Describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source [year 4] • Describe the effects of simple forces that involve contact (air and water resistance, friction) [year 5], that act at a distance (magnetic forces, including those between like and unlike magnetic poles) [year 3], and gravity [year 5] • Identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force [year 5] • Use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams [year 6] • Describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night [year 5].

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