Progression of Knowledge, Skills and understanding - Science

Autumn Spring Summer	Year 1	Year 2
Animals including Humans	**to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals** • *Which animals are they already familiar with/can they name?* • *Which pets?* • *What do they know about the 5 groups already?* • *Do they know what makes a fish a fish etc?* **identify and name a variety of common animals that are carnivores, herbivores and omnivores** • *Which animals can they confidently name that can then be investigated as to what they eat?* • *Do they know what any animals eat? What do we eat?* • *Carnivore- an animal that feeds on other animals* • *Herbivore-an animal that feeds on plants* • *Omnivore-an animal that eats a variety of foods of both plant and animal origin* • *Carnivores- do they know what 'meat' means?* **describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)** • *Understand what structure means?* • *Understand how to describe and compare* • *What parts(structure) can they already identify?* • *Fish- live in water, gills, fins, some lay eggs, scales, cold blooded/Reptiles-dry scaly skin, cold blooded, most lay eggs, lungs/Mammals-warm blooded, live young, hair or fur, produce milk/Amphibians-live on land and in water,*	**to notice that animals, including humans, have offspring which grow into adults** • *What are offspring?* • *What is reproduction in animals? (in terms of growth, NOT how it occurs)* • *The stages of human growth-baby, toddler, child, teenager, adult/animals-egg, chick, chicken; egg, caterpillar, pupa, butterfly; spawn, tadpole, frog; lamb, sheep.* **find out about and describe the basic needs of animals, including humans, for survival (water, food and air)** • *What does 'survive' mean?* • *How can we find out what we (animals and humans) need to survive?* • *What/how do we get the things we (animals and humans) need to survive?* • *How do we breathe? - humans/ some animals=lungs, fish, some amphibians and insects=gills* • *How do we eat/get the nutrition we need? (incl water)*

	moist skin, cold blooded, breathe air through skin, lay eggs. Birds- wings, feathers, 2 legs, lay eggs, warm blooded, beaks.	

	Year 1	Year 2
Y1 Everyday Materials/Y2 Uses of everyday materials	**identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.** • *Which main body parts do they know? Can they name (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth)?* • *Do they know what any of their senses are/do?* • *Can they distinguish between the part of the body and the sense?* **distinguish between an object and the material from which it is made** • *Names of everyday objects* • *Names of materials that things can be made of- wood, plastic, glass, metal, water, rock, different types of fabric, paper, elastic, foil and combinations of materials* • *Some objects are named the same as the material e.g. a glass, a rock, a stone* • *Be able to explore and name both the object and what it is made of e.g., it's a toy car and it's made of plastic* **identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock** • What are the everyday objects made of?- identify wood, plastic, glass, metal, water, rock, different types of fabric, paper, elastic, foil and combinations of materials	**describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.** • *What is exercise? Examples of exercise- (walking, being active and other forms, not just going to a gym, flexing muscles, doing press ups!)* • *Why is exercise important? Link to hear rate/pulse in P.E* • *What are the different types of food? Main Food groups= Fruit and vegetables. Proteins incl meats, fish, eggs, beans, pulses. Dairy and alternatives. Carbohydrates incl bread, rice, pasta, potatoes and other starchy foods. Oils and spreads. Also discuss food and drinks high in fats and/or sugars which should only be eaten occasionally* • *What should we eat more/less of ? How can we find out?* • *What is hygiene? Examples of how to keep clean and healthy. Links with PSHE* **identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses** • *What are the material names? (recap from Year 1)* • *Be able to identify how everyday materials around them are used for different purposes- look around the room and discuss* • *Understand and become familiar with the fact that some materials are used for more than one thing e.g. metal can be used for coins, cans, cars and table legs; wood can be used for matches, floors and telegraph poles*

	• There are different types and forms of wood, plastic etc, it will not always look the same **describe the simple physical properties of a variety of everyday materials** • *What are physical properties?(adult information-physical properties are measurable e.g. length, colour, density, mass, elasticity, pressure, temp, shape) Children explore how objects 'feel', explore how objects 'look', explore what objects can do* • *Learn the words that describe the 'properties' (look/ ability to do something) - hard/soft, stretchy/stiff, heavy/light, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent* **compare and group together a variety of everyday materials on the basis of their simple physical properties** • *Be able to say what the different materials 'can/can't do', 'looks like'* • *Be able to compare by saying 'this one is bendy; this one is not' etc* • *Understand how to group things together according to what they 'can/can't do' e.g, group together bendy objects or objects that absorb liquid*	• *Understand and become familiar with the fact that different materials can be used for the same thing e.g. spoons can be made from plastic, wood, metal but not normally glass* • *What are the properties of everyday materials? (recap from Year 1- e.g. hard/soft, stretchy/stiff, heavy/light, shiny/dull, rough/smooth, bendy/not bendy, waterproof/not waterproof, absorbent/not absorbent, opaque/transparent)* • *Which properties make a material suitable for a purpose?* • *Which properties make a material unsuitable for a purpose?* • *Learn about famous people who developed useful new materials e.g. John Dunlop -pneumatic/inflatable tyre, Charles Macintosh--raincoat* **find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching** • *Understand what a solid object is (a 3d object that maintains its own shape instead of conforming to the shape of its container e.g. ice compared to water* • *Understand what 'changed' means in terms of objects, how can we confirm if it has 'changed'* • *Understand that a 'changed' object will be different in shape /length/height* • *How do we apply the squash/bend/twist/stretch* • *Which objects shape can be changed by the squashing/bending/twisting/stretching?* • *Do the shapes remain 'changed' or do they change back?*

	Year 1	Year 2
Plants	**identify and name a variety of common wild and garden plants, including deciduous and evergreen trees** • *Understand that some plants grow naturally wherever they seed if the conditions are right* • *Understand that people plant seeds/bulbs for food, for what it looks like, for function e.g., grass* • *Understand that deciduous means it sheds its leaves annually e.g., typically in the UK during the Autumn, leaving it bare in the Winter* • *Understand that evergreen means it keeps its leaves, which remain functional through more than one growing season* • *Be able to identify, which means to indicate what the plants are by matching plants to pictures or linking them to what they produce e.g. an oak tree can be identified by the presence of acorns or by the shape of its leaf* • *Learn to name some common plants in the school grounds or from home e.g. flowers, weeds, plants – including food producing ones, deciduous trees and evergreen trees* • *Be given the opportunity to use the local environment, including the school grounds, to explore and find out about plants growing in their habitats* • *Be given the opportunity to observe flowers and vegetables growing and changing* **identify and describe the basic structure of a variety of common flowering plants, including trees** • *Understand that identify and describe means to indicate by labelling or talking about the basic visible parts of a flowering plant: including leaves, flowers, petals, root, bulb, seed, stem* • *Understand that identify and describe means to indicate by labelling or talking about the basic visible parts of a*	**observe and describe how seeds and bulbs grow into mature plants** • *Understand the basic life cycle of a plant- (5 stages=seed, germination, growth, reproduction, pollination and seed spreading stage)* • *Be able to name seed/bulb, seedling, growing plant, mature plant and pollen (Year 1 = leaves, flowers, petals, root, bulb, seed, stem, blossom, branch, trunk)* • *Understand that seeds and bulbs are the part of the plant that produces a new plant* • *Be able to make simple observations of growing plants* • *Be able to describe the changes they see during growth* **find out and describe how plants need water, light and a suitable temperature to grow and stay healthy** • *Understand how to find answers to questions both from secondary sources and through hands on scientific investigations* • *Understands what plants need to germinate (seed to seedling process). Seeds remain dormant until conditions are favourable.* • *Be able to describe that seeds need water, oxygen and optimal temperature to germinate and continue to grow* • *Be able to describe what a healthy plant looks like* • *Be able to suggest why a plant is not healthy, what is it lacking? How do we know that it is not healthy?*

	tree: including leaves, flowers/blossom, root, seed, trunk, branch • *Be able to use magnifying glasses to look closely at the structures listed* • *Be able to compare plants by looking at their visible features*	

	Year 1	**Year 2**
Seasonal Changes	**observe changes across the four seasons** • *What are the 4 seasons?* • *What are the months of the year?* • *Which months are grouped in each season? (Adult info- Climatologists usually use full months to represent the seasons. Winter is considered to be December January and February. They are the coldest months of the year with the shortest days. Spring=March-May. Summer= June –August. Autumn= September-November. Astronomical Winter starts on December 21st the day of the Winter Solstice and is based on the position of Eart in relation to the sun. For ease of learning teach the Climatologists groupings.* • *Why do we have seasons? What changes in our local area?* • *What are the changes we see in trees/weather/what we wear/celebrations within each season?* **observe and describe weather associated with the seasons and how day length varies.** • *What is the weather like in a week in each season at our school?* • *What is it like when we get up/go home/go to bed in the Winter etc? Light/dark? Ask the children to observe what*	**N/A**

	it is like when they return home from an after-school club/ go to bed in December and June to compare.	

	Year 1	**Year 2**
Living things and their habitats	N/A	**explore and compare the differences between things that are living, dead, and things that have never been alive** • *Understand the term and characteristics of something that is 'living'.* • *Understand that living things carry out the following life processes- M- movement (fastest movement=cheetah but plants also move), R- respiration (a process that releases energy stored in food) , S- sensitivity (in order to survive all living organisms need to be able to sense its environment e.g. to find food, shelter or avoid predators) , G-growth (all grow, some grow continually e.g. some plants, whilst animals stop growing in adulthood but continue to grow/replace cells such as skin), R-reproduce (various kinds - some require male and female but some reproduce on their own such as bacteria), E-excretion (getting rid of waste from chemical reactions e.g. co2 is the by-product of respiration which plants and animals carry out. Pooing is Egestion, which is performed by animals), N-nutrition (every living organism needs food. plants make own food from photosynthesis, but all others get it from somewhere else).* • *Understand the term and characteristics of something that has never been alive e.g. metal, plastic and stone* • *Understand the term 'dead' e.g. once living but no longer living as unable to sustain life due to circumstances or conditions* • *Be able to compare things that are 'living' 'dead' or never been alive by looking at the differences between them* **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 • *Understand that a 'habitat' is a natural environment or home of a variety of plants and animals* • *Understand that a 'micro-habitat' is a very small habitat, for example for woodlice under stones, logs or leaf litter* • *Understand that the plants and animals depend on each other to survive e.g. plants serving as a food source and shelter for animals* • *Understand that most things live in habitats that are suited to their needs and which provide what they need to survive* • *Be able to compare animals in familiar habitats with animals found in less familiar habitats, e.g. on the seashore, in woodland, in the ocean, in the rainforest* • *Be able to describe the conditions in different habitat* **identify and name a variety of plants and animals in their habitats, including microhabitats** • *Be able to name common plants found in a range of habitats* • *Be able to name common animals found in a range of habitats* **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** • *Understand that animals including humans eat plants and other animals (recap Year 1)* • *Be able to construct simple food chains e.g. grass, cow, human*

Working Scientifically – runs through all science learning set out above

	Year 1	Year 2
Questioning and Researching in Science -: asking simple questions and recognising that they can be answered in different ways	Think of appropriate questions (with support) whilst exploring the world around them e.g., explore and answer questions about plants growing/animals in their habitats. Raise and answer questions about materials. Ask questions (with some support e.g., prompts) to gain appropriate information linked to the task. Use secondary sources (with support) such as books and computers to find answers.	Raise their own questions whilst exploring the world around them e.g., ask questions about physical processes, plants, animals, life processes, habitats. Think of ways to try and answer these questions. Ask people questions (when they think it is beneficial). Use simple secondary sources to find answers e.g., books, computers, videos. Understand (begin to) which pieces of information are relevant and which are not.

	Year 1	Year 2
Planning, Observing and Measuring -: observing closely, using simple equipment	Take part (with support) in practical activities. Use all 5 senses when appropriate to make observations. Use simple features to compare objects (begin to), materials and living things- adult to suggest headings for comparable features. Observe (with guidance) changes over time- adult to suggest headings for observable changes including time measurements (adult to set standard measures- minutes, hours, days, months). Measure-: With support, use simple measurements (including standard units m, cm, kg, g, ml, l, hours, minutes, seconds) Use equipment (with support) – (rulers, jugs, hand lenses, sand timers, clocks) to gather data.	Take part in practical activities using all 5 senses when appropriate. Make relevant observations. Use simple features to compare objects, materials and living things. Observe changes over time- pupils to suggest headings for observable changes and suggest type of measurement they could use (time). Measure-; Use standard measurements (m, cm, kg, g, l, ml, c, hours, minutes, seconds) to the nearest appropriate unit.

		Use equipment with increasing independence (rulers, hand lenses, measuring vessels, thermometer, scales, clock, timers) to gather data.

Testing and obtaining evidence in Science-: performing simple tests	Take part (with support) in practical activities that enable results to be gathered by the class. Gather relevant data (with support) Record it pictorially or with numbers in a suitable clear format - Simple tables created by adult. Interpret (begin to) block diagrams.	Take part in practical activities that enable results to be gathered by class, group, individuals. Suggest ways of recording the data they plan to gather. Work together to decide how best to gather and present the relevant results. Record data collected in simple pictograms, tally charts, block diagrams and simple tables.

	Year 1	**Year 2**
Identifying and Comparing in Science-: identifying and classifying	Compare 2 or more objects including visual features, common properties. Adult to set which simple features to compare with objects, materials and living things. Decide (with help) how to sort and group them- what could the title of our groups or sets be?	Suggest (child) simple features to use to compare objects, materials and living things. These features may be adaptions that it has made to its habitat or a child applying knowledge about its habitat/property of material- not necessarily a visual feature. Decide (child) how to sort and group the objects, materials, living-things.

	Year 1	Year 2
Considering Evidence-: using their observations and ideas to suggest answers to questions	Recognise (With support, begin to) how the data they have gathered or things they have observed, might answer the original questions they set out to answer. Look at patterns and relationships in their data and observations. Talk about (begin to) what they have found out and how they found it out by answering questions posed by adult.	Recognise ways in which they might answer scientific questions e.g., by understanding that the data gathered or activity led to relevant information that will help to answer their original question or problem. Notice (begin to with guidance) patterns and relationships. Talk about what they have found out and how they found it out.

	Year 1	Year 2
Gathering , Presenting results and Evaluating-: gathering and recording data to help in answering questions	Gather relevant data (with support). Record it pictorially or with numbers in a suitable clear format - Simple pre prepared tables. Communicate their findings (with help) in a range of ways and begin to use simple scientific language linked to the knowledge in the Programme of study. Talk about what they have done, share pictures, pre-prepared tables that they have filled in. Show understanding (begin to through questioning) of what they did and why.	Suggest and decide together how best to gather/ present the relevant results. Record data collected in simple pictograms, tally charts, block diagrams and simple tables. Communicate their findings (with help) in a range of ways and begin to use simple scientific language linked to the Programme of Study. Talk (with prompts) about the relevant activity, Explain simple steps in the process. Share the results and their thoughts as to whether they answered their original question or task.

Appendix	Year1 National Curriculum	Year 2 National Curriculum
	Plants Pupils should be taught to: 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. **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. **Everyday materials** Pupils should be taught to: distinguish between an object and the material from which it is made	**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. **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. **Uses of everyday materials** Pupils should be taught to:

	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. **Seasonal changes** Pupils should be taught to: observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. N/A	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. **N/A** **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 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.