

Science Progression Document 2022

	Subject Specific Knowledge	Subject Specific Skills
Nursery	<p>Materials That we can investigate materials by using senses That materials and objects must not be put in mouth, ears etc We can use materials for a purpose. Different materials are good for different things That some materials change when they get wet, frozen or are heated.</p> <p>Living Things That we take care of living things Minibeasts in our garden are animals and need care That plants are alive and need care The names for the main parts of a tree Some animals hatch from eggs That tadpoles are animals and will turn into frogs That animals need care That different animals need different food Begin to understand that we eat parts of some plants, but that others are dangerous to eat</p> <p>Time and Seasons Differences between day and night</p> <p>Vocabulary - names of everyday materials - wood, plastic, metal, sponge, glass etc Everyday words to describe the temperature and weather they experience Roots, trunk, leaves, bark, branches, twigs Frogspawn, egg, hatch, tadpole, froglet, frog, life-cycle</p>	<p>Materials Actively collect and enjoy transporting materials. Follow adult prompts to explore simple sensory properties of everyday materials and demonstrate engagement facially or through body language. Use some very simple adjectives to describe the sensory properties of everyday materials. Collect particular materials for a purpose. Actively explore the properties of everyday materials through spontaneous experimentation. Begin to answer closed and anticipatory questions in simple adult led experiments about the properties of materials</p> <p>Living Things Engage in joint attention with adults for short periods of time in respectful observations of living things. Work alongside adults imitating their actions as they care for living things. Narrate, a stage at a time, the way a growing plant or animal is changing. Respond appropriately to adult guidance to treat living things with care. Recognise self in baby photographs and relate simple family stories about babyhood.</p> <p>Forces</p>

	<p>Names of minibeasts they encounter - snail, slug, spider, ant, woodlouse etc</p>	<p>Construct with simple mechanisms such as axles and wheels Create own action and reaction games such as water flow structures and simple wheeled vehicles from construction kits and give very simple explanations of how they work.</p>
<p>Reception</p>	<p>Living Things Know names for some types of tree and know some trees and plants change across the seasons Know how to grow seeds and care for seedlings. Identify foods that come from plants. Name plants and parts of plants in allotment harvest. Know that children and adults were babies in the past. Know that adults can remember things from the past. Know that there are similarities and differences between babies, four/five year olds and adult) Describe how people grow up and change Know that birds and animals have different life stages Know that bees play an important role in helping humans and other animals Knows how to take care and nurture edible plants. Know that there are similarities and differences between the animals and plants in the beach environment and in the farm environment. Describe natural and manmade beach detritus and know the dangers to wildlife from man made rubbish.</p> <p>Materials Know materials change state when affected by temperature, time or other factor (e.g water) Describe and explain changes of state with fruit, ice/snow, chocolate, wax candles</p>	<p>Living Things Describe changes to trees and woodland plants in autumn (deciduous, evergreen, leaves) Demonstrate how to plant and harvest Predict how plants will grow Describe changes to trees and woodland plants in Autumn and Winter (deciduous, evergreen, leaves) Demonstrate how to plant bulbs. Predict how plants will grow Describe changes to trees and woodland plants and animals in winter. (hibernate) Describe and explain changes of state with water Correctly identify similarities and differences between babies and four year olds. Describe how people change in the first four years of life. Identify simple similarities and differences between babies, four year olds and adults. Can sequence the life of a baby bird from hatching to maturity Describe and recall the transition from egg to caterpillar to adults. Know that there are changes to trees and plants in different seasons.</p> <p>Describe the role of bees in helping humans and</p>

	<p>Vocabulary - Names of seasons Words to describe own experiences of weather, temperature Names of a growing range of everyday materials and simple words to describe their observable properties lifecycle, eggs, pupa/ chrysalis, seed, buds, bulbs, seedling, flower, roots, stem, branch Insects, pollen, nectar, beehive,</p>	<p>other animals Demonstrate how to nurture edible plants. Identify similarities and differences between the animals and plants in the beach environment and in the farm environment.</p> <p>Materials Describes change of state with gloop, clay and dough, water and ice, chocolate, candles etc</p> <p>Describe the life of a scientist who has changed our world</p>
<p>Year 1</p>	<p><u>Plants</u></p> <ul style="list-style-type: none"> - 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. <p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> - 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 <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> - 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 	<p>Planning and predicting:</p> <ul style="list-style-type: none"> - Be able to discuss what they are trying to find out. - Suggest what might happen. Suggest ways to test ideas. - Begin to recognise different ways in which you may answer a scientific question <p>Investigating and observing:</p> <ul style="list-style-type: none"> - Make observations using appropriate senses. - Explore using their five senses. - Make simple comparisons and groupings, including those based on own criteria. - Use their observations and ideas to

	<p>human body and say which part of the body is associated with each sense</p> <p><u>Everyday materials</u></p> <ul style="list-style-type: none"> - 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. <p><u>Seasonal changes</u></p> <ul style="list-style-type: none"> - Observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies. 	<p>suggest answers to questions and draw conclusions</p> <ul style="list-style-type: none"> - With support carry out simple tests and experiments - Use of simple secondary sources to find answers to questions they have - Use scientific equipment appropriately and understand its purpose (magnifying glass, egg timer, non standard representations) <p>Recording analysing and evaluating:</p> <ul style="list-style-type: none"> - Communicate findings in simple ways, using photographs, drawings and direct comparison. - Suggest whether something (a variable) seems to have made a difference. - Gathering and recording data to help in answering questions. <p>Maths in Science</p> <ul style="list-style-type: none"> - Complete pictograms and simple charts to show findings - Year 1 - Maths vocabulary - hotter / colder / greater / smaller / more than / less than / longer / shorter / tall / short / long / short - Use simple Year 1 Scientific vocabulary to communicate findings
Year 2	<p>Living things and their habitats</p> <ul style="list-style-type: none"> - Explore and compare the differences between things that are 	<p>Planning and predicting:</p> <ul style="list-style-type: none"> - With help, suggest some ideas and questions. - With help, plan how to collect evidence.

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 micro- 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.

Plants

- 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

- 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.
- Understand that some substances are poisonous and what humans and adults shouldn't consume

Uses of everyday materials

- 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

- Suggest what might happen and begin to give reasons for their predictions.
- Think about and discuss whether comparisons and tests are fair or unfair.

Investigating and observing:

- Make observations (including observations over time) and comparisons using simple equipment, following simple instructions.
- Use first-hand experience and, with help, simple information to answer questions.
- Carry out simple tests, comparative tests and experiments
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Recognise and describe simple patterns seen from tests and observations

Recording analysing and evaluating:

- Record findings in simple ways including tables, graphs etc.
- Say whether what happened was what was expected and draw simple conclusions.
- Ask simple questions and recognising that they can be answered in different ways
- Suggest where something has made a difference (Variables)
- Use of simple secondary sources to find answers to questions they have

	<p>and stretching.</p>	<ul style="list-style-type: none"> - Use scientific equipment appropriately and understand its purpose (rulers, meter sticks, thermometers, measuring jugs, scales, magnifying glass, timers) <p><u>Maths in Science</u></p> <ul style="list-style-type: none"> - interpret and construct simple pictograms, tally charts, block diagrams and simple tables - Simple bar charts - ask and answer questions about totalling and comparing categorical data - Year 2 - Maths vocabulary - Standard measures - height, temperature, capacity, - Use simple Year 1 Scientific vocabulary to communicate findings
<p>Year 3</p>	<p>Plants</p> <ul style="list-style-type: none"> - Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and 	<p>Planning and predicting:</p> <ul style="list-style-type: none"> - Respond to suggestions. With help, put forward ideas about testing. - With help, consider what constitutes a fair test including variables - Predict and estimate based on

	<p>how they vary from plant to plant</p> <ul style="list-style-type: none"> - 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. <p>Animals including humans</p> <ul style="list-style-type: none"> - Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat - Identify that humans and some other animals have skeletons and muscles for support, protection and movement. <p>Rocks</p> <ul style="list-style-type: none"> - Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - Describe in simple terms how fossils are formed when things that have lived are trapped within rock - Recognise that soils are made from rocks and organic matter. <p>Light</p> <ul style="list-style-type: none"> - Recognise that they need light in order to see things and that dark is the absence of light - Notice that light is reflected from surfaces - Recognise that light from the sun can be dangerous and that there are ways to protect their eyes - Recognise that shadows are formed when the light from a light source is blocked by 	<p>observations and data.</p> <p>Investigating and observing:-</p> <ul style="list-style-type: none"> - Make observations and comparisons. - Measure length and time in standard measures using simple measuring equipment. - Use first-hand experience and simple information sources to answer questions. - Ask relevant questions and suggest ways to answer these in tests - Set up simple practical enquiries, comparative and fair tests - Make observations using standard units, scaled measures, using a range of equipment, including thermometers and data loggers - Look for patterns and relationships and collect relevant data <p>Recording, analysing and evaluating: -</p> <ul style="list-style-type: none"> - Communicate findings in a variety of ways. - Say whether what happened was what was expected. - With help, identify simple patterns and suggest explanations. - Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions - Use results and information presented to compare amounts - Identify differences, similarities or changes related to simple scientific ideas
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	<p>an opaque object</p> <ul style="list-style-type: none"> - Find patterns in the way that the size of shadows change. <p>Forces and Magnets</p> <ul style="list-style-type: none"> - Compare how things move on different surfaces - Notice that some forces need contact between two objects, but magnetic forces can act at a distance - Observe how magnets attract or repel each other and attract some materials and not others - Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials - Describe magnets as having two poles - Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	<p>and processes</p> <ul style="list-style-type: none"> - Use of appropriate secondary sources to answer questions they may have <p>Maths in Science</p> <ul style="list-style-type: none"> - Record findings using simple scientific language, drawings, labelled diagrams, pictograms, keys, scaled bar charts, and tables - Interpret and present data in a range of ways (bar charts, scaled bar charts and pictogram tables) - Use Year 3 scientific vocabulary to discuss ideas and communicate findings - Year 3 - Maths vocabulary - mm/cm/m kg/g l/ml. more and fewer. Longer and shorter. Quicker, faster
Year 4	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> - recognise that living things can be grouped in a variety of ways <p>explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <ul style="list-style-type: none"> - recognise that environments can change and that this can sometimes pose dangers to living things. <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> - describe the simple functions of the basic parts of the digestive system in humans 	<p>Planning and predicting:</p> <ul style="list-style-type: none"> - Recognise why it is important to collect data to answer questions. - Suggest questions that can be tested. ** build on y5 - Suggest ways hypothesis can be tested and make predictions. - With help, consider what constitutes a fair test, showing a basic understanding of

- 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.

States of matter

- 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.

Sound

- 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.

Electricity

- 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

variables and what might change and plan for this

- Understand when a test is fair and explain why, with relation to one variable

Investigating and observing

- Make relevant observations and comparisons.
- Take measurements of time, temperature, force and measurements of length.
- With help, carry out a fair test recognising and explaining why it is fair.
- Make systematic observations using standard units, scaled measures, using a range of equipment, including thermometers and data loggers
- Set up simple practical enquiries, comparative and fair tests

Recording, analysing and evaluating

- Explain what the evidence shows in a scientific way and whether it supports predictions.
- Suggest improvements in their work.
- Ask relevant questions and use different types of scientific enquiries to answer them
- Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Use straightforward scientific evidence to

	<ul style="list-style-type: none"> - recognise some common conductors and insulators, and associate metals with being good conductors. 	<p>answer questions or to support their findings.</p> <ul style="list-style-type: none"> - Use a range of appropriate secondary sources to answer questions that cannot be answered through practical investigations <p>Maths in Science</p> <ul style="list-style-type: none"> - Interpret and present discrete and continuous data using appropriate methods including bar charts and time and line graphs - Use results and information presented to compare amounts, how many more, more and fewer - Record findings using simple scientific language, labelled diagrams, pictograms, keys and tables - Use Year 4 scientific vocabulary to discuss ideas and communicate findings - Year 4 - Maths vocabulary - convert between different units of measure (vocabulary from year 3) More and fewer. How many more. Intervals. Axis. Scale
Year 5	<p>Living things and their habitats</p> <ul style="list-style-type: none"> - Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird - Describe the life process of reproduction in some plants and animals. <p>Animals including humans</p> <ul style="list-style-type: none"> - Describe the changes as humans develop to old age. <p>Properties and changes of materials</p>	<p>Planning and predicting</p> <ul style="list-style-type: none"> - Recognise that scientific ideas are based on evidence and creative thinking. - Make predictions based on prior scientific knowledge. - Suggest methods of testing, including a fair test, with reference to multiple variables - Suggest how to collect evidence.

- 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.

Earth and space

- 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.

Forces

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth

- Select suitable equipment.
- **Predict, estimate and make hypothesis based on observations and data.**

Investigating and observing

- Carry out a fair test explaining why it is fair, with reference to multiple variables
- Understand why observations and measurements need to be repeated.
- Select information from provided sources.
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- **Look for patterns and relationships and collect relevant data**

Recording, analysing and evaluating

- Communicate findings in a variety of ways.
- Identify simple trends and patterns.
- Communicate findings in tables, bar charts and line graphs, whilst making appropriate use of ICT.
- Identify trends and patterns and offer explanations for these.
- Draw conclusions and communicate them in appropriate scientific language.
- Suggest improvements in their work giving reasons.
- Using test results to make predictions to set up further comparative and fair tests
- Report on and present findings from enquiries, including conclusions, in oral

	<p>and the falling object</p> <ul style="list-style-type: none"> - Identify the effects of air resistance, water resistance and friction, that act between moving surfaces - Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. 	<p>and written forms such as displays and other presentations</p> <ul style="list-style-type: none"> - Identify scientific evidence that has been used to support or refute ideas or arguments. - Recognise which secondary sources are most useful, separating opinion from fact - Identify where there may be anomalies in data and suggest how this might have occurred <p>Maths in Science</p> <ul style="list-style-type: none"> - Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs - Interpret information from tables and compare data in line graphs - Use Year 5 scientific vocabulary to communicate and justify scientific ideas - Year 5 - Maths vocabulary - convert between different units of measure. Axis. Scale. Interval
Year 6	<p><u>Living things and their habitats</u></p> <ul style="list-style-type: none"> - describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals - give reasons for classifying plants and animals based on specific characteristics. <p><u>Animals including humans</u></p> <ul style="list-style-type: none"> - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood 	<p>Planning and predicting</p> <ul style="list-style-type: none"> - Consider how scientists have combined evidence from observation and measurement with creative thinking to suggest new ideas and explanations for phenomena. - Make predictions based on scientific knowledge and understanding. - Suggest methods of testing including a fair test and how to collect evidence, ensuring it is sufficient and appropriate.

- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Recognise and understand allergies, what these are and how to protect against these
- Understand immunisation and vaccinations and the importance and benefits of these
- describe the ways in which nutrients and water are transported within animals, including humans.

Evolution and inheritance

- 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.

Light

- 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.

Investigating and observing

- Carry out a fair test identifying key factors to be considered.
- **M**ake a variety of relevant observations and measurements using simple apparatus correctly.
- Decide when observations and measurements need to be checked, by repeating, to give more reliable data.
- **S**elect information from a range of sources.
- Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Use test results to make predictions to set up further comparative and fair tests
- Identify scientific evidence that has been used to support or refute ideas or arguments.

Recording, analysing and evaluating

- Communicate findings in tables, bar charts, line graphs and pie charts, whilst making appropriate use of ICT.
- Identify trends and patterns and results that do not appear to fit the pattern.
- Provide explanations for differences in observations and measurements.
- Draw conclusions and communicate them in appropriate scientific language.

Electricity

- 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.

- Make practical suggestions for improving methods in their work giving suggestions.
- Report on and present 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

- **Look for patterns and relationships and collect relevant data**
- **Identify variables and plan for fair tests.**
- **Predict, estimate and make hypothesis based on observations and data.**
- **Recognise which secondary sources are most useful, separating opinion from fact**
- Identify where there may be anomalies in data and suggest how to rectify this

Maths in Science

- Record data and results of increasing complexity using scientific diagrams and labels, classification keys,, scatter graphs, bar and pie charts
- Interpret and compare information and data in a variety of ways (mean) including from tables, line graphs and pie charts.
- Use Year 6 scientific vocabulary to communicate and justify scientific ideas

		<ul style="list-style-type: none">- Year 6 - Maths vocabulary - convert between different units of measure, scales, sectors,
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