



Science Progression of Knowledge, Skills and Enquiry.

**Killamarsh Infant and Nursery School**  
**adapted from**

**Plymouth Science**



**K i l l a m a r s h**  
**I n f a n t & N u r s e r y S c h o o l**  
**'Brighter Beginnings'**

# Science Progression of Knowledge, Skills and Enquiry

This document is a whole school overview.

Page 1: demonstrates what a typical scientist will look like at the end of each year, combining the key skills and knowledge they will require.

Page 2: onwards has objectives for each year group with key vocabulary for that module and also 'key indicators' which demonstrates what the children should know to achieve the objective.

Any text boxes in a different colour with a thick border shows that this skill/knowledge is taught in a different module but builds on from learning in that module e.g.

- Name common plants and describe the basic structure of flowering plants, including trees.

The red writing in brackets underneath show where this objective was taken from. This is to allow teachers to make the links to prior learning wherever possible.

<u>Scientific Enquiry</u>	
Research	
Pattern Seeking	
Observing (Over time)	
Testing	
Identifying and Classifying	
Problem solving	

**Scientific Enquiry** - This is the National Curriculum Working Scientifically objectives for Key Stage 1. These are highlighted through the document in purple. This is to ensure teachers are teaching knowledge alongside skills.

### Year 1 / 2 Working Scientifically

- 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.

Our vision for our scientists in each year group is that:

### **Foundation/EYFS**




Children will ask questions about the environment including the weather outside. They will be able to suggest what they might wear. They will develop an understanding of growth, decay and changes over time and show care and concern for living things and the environment. They will use their senses when walking around and investigating. They will develop questioning and curiosity through play and understand the concept of forces and electricity through twisting, pushing, slotting and exploring magnetic toys. They can talk about similarities and differences between different living things or materials and make simple observations about animals.




### **Year 1**

Children will be asking questions about the local environment including plants and animals found there including how they can look after them. They will observe and talk about the weather and changes. They will explore different materials using scientific language to describe them. We will carry out simple experiments and consider what it means to conduct a 'fair' test. We will begin to look at simple recording methods to show our results.




### **Year 2**




Children will be asking questions about the local environment including discussing how plants grow, survive, germinate and reproduce. They investigate different habitats and observe how different animals depend on each other and its life processes. They understand basic needs of animal (including humans) survival including exercise and nutrition. They can identify properties of different materials and state why they are suited to purpose. They can name some scientists who have developed new materials e.g. Charles Macintosh.




Year Group	EYFS	Year 1	Year 2
<p data-bbox="136 124 277 172"><b>Plants</b></p> 	<p data-bbox="344 118 949 177">Make simple observations about plants and can explain why some things occur.</p>	<p data-bbox="972 118 1464 312">Name common plants and <b>describe</b> the basic structure of flowering plants, including deciduous and evergreen. <b>Identify</b> and <b>describe</b> the basic structure of a variety of common flowering plants, including trees.</p> 	<p data-bbox="1518 118 2145 248"><b>Observe</b> and describe how seeds and bulbs grow into mature plants. <b>Find out</b> and <b>describe</b> how plants need water, light and a suitable temperature to grow and stay healthy.</p> 
<p data-bbox="103 507 311 539"><b>Key vocabulary</b></p>	<p data-bbox="344 507 949 675">Plant, leaf, stem, flower, petal, grow, rain, sun, water, soil, seed, roots, tree, conker, acorn, pine cone, natural materials, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil, names of plants they grow e.g. daffodil.</p>	<p data-bbox="972 507 1464 635">Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud. Names of trees in local area, garden and wild flowering plants.</p>	<p data-bbox="1518 507 2136 571">As year 1 plus light, shade, sun, warm, cool, water, grow, healthy, bulb, germinate, shoot and seedling.</p>
<p data-bbox="109 686 304 718"><b>Key indicators</b></p>	<p data-bbox="344 686 927 745"><u>The world</u>: Can develop an understanding of growth, decay and changes over time.</p> <p data-bbox="344 802 882 866">Shows concern and care for living things and the environment.</p>	<p data-bbox="972 686 1420 745">Can name trees and other plants they see regularly.</p> <p data-bbox="972 754 1487 850">Can describe key features of the trees and plants e.g. shapes of leaves/colour of the flower/blossom.</p> <p data-bbox="972 860 1487 956">Can point out trees which lost their leaves and those who keep them all year. Can point to and name parts of a plant.</p> <p data-bbox="972 965 1487 1024">Can use simple charts to sort. Can use photos to talk about how plants change.</p>	<p data-bbox="1518 686 2136 745">Can describe how plants that have grown from seeds and bulbs have developed over time.</p> <p data-bbox="1518 754 2136 786">Can identify plants that grew well in different conditions.</p> <p data-bbox="1518 796 2136 855">Can spot similarities and differences between bulbs and seeds.</p> <p data-bbox="1518 865 2159 928">Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants.</p>
<p data-bbox="87 1034 327 1066"><b>Sticky Knowledge</b></p>	<p data-bbox="344 1034 770 1161">Plants grow from seeds/bulbs Plants need water to grow and survive Plants are important We can eat lots of plants</p>	<p data-bbox="972 1034 1487 1161">Plants grow from seeds/bulbs Plants need light and water to grow and survive Plants are important We can eat lots of plants</p>	<p data-bbox="1518 1034 2136 1257">Plants grow from seeds/bulbs Plants need light, water and warmth to grow and survive Flowers make seeds to make more plants (reproduce) Plants are important We need plants to survive (to clean air, to eat) We can eat different parts of the plants (leaves, stems, roots, seeds, fruit).</p>

Year Group	EYFS	Year 1	Year 2
<p><b>Animals including humans.</b></p> 	<p><u>Health and selfcare</u>- children notice changes in their bodies after exercise such as heart beating faster. Children understand the importance of handwashing.</p>	<p><b>Identify</b> and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. <b>Identify</b> and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p><b>Describe</b> and <b>compare</b> the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p><b>Identify</b>, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense</p> 	<p><b>Notice</b> that animals, including humans, have offspring which grow into adults.</p> <p><b>Find out</b> about and <b>describe</b> the basic needs of animals, including humans, for survival (water, food and air)</p> <p><b>Describe</b> the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p> 
<p><b>Key vocabulary</b></p>	<p>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart, egg, chick, bird, caterpillar, cocoon, chrysalis, butterfly, frog spawn, tadpole, froglet, frog, grow, change, die, names of animals and their young, swim, walk, run, jump, fly, patterns, spots, stripes, grow, change, baby, toddler, child, adult, old person, smell, taste, touch, feel, hear, see, blind, deaf names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice, hair (e.g. black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (e.g. blue, brown, green, grey), skin (e.g. black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman.</p>	<p>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all senses. parts of the human body, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue.</p>	<p>Offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, survival, exercise. reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, water, food, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy).</p>

<p><b>Key indicators</b></p>	<p>They can talk about simple similarities and differences between living things. They can make simple observations about animals and explain why some things occur.</p>	<p>Can name a range of animals which includes animals from each of the vertebrate groups. Can describe the key features of named animals. Can label key features on a picture/diagram. Can write descriptively about an animal. Can write a 'What am I?' riddle about an animal. Can describe what a range of animals eat. Can compare and classify animals.</p>	<p>Can sequence the stages of a baby. Observe these changes. Can describe how animals change as they get older. Develops understanding of how insects change (more than a butterfly) through lifecycle diagrams. Can explain what humans and other animals need to survive- this could be through planning a trip to the moon or desert Island. Can describe how to keep clean and healthy. Has a good understanding of the food plate and understands 'a healthy balanced diet'. Can create a diet for an athlete. Can adopt a menu to substitute food from the eat well plate. Understands the effect of exercise on the body.</p>
<p><b>Sticky Knowledge</b></p>	<p>Animals have senses to help them survive. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.</p>	<p>There are many different animals with different characteristics. Animals have senses to help individuals survive. When animals sense things they are able to respond. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.</p>	<p>Animals move in order to survive. Different animals move in different ways to help them survive. Exercise keeps animal's bodies in good condition and increases survival chances. All animals eventually die. Animals reproduce new animals when they reach maturity. Animals grow until maturity and then do not grow any larger.</p>

Year Group	EYFS	Year 1	Year 2
<p><b>Living Things &amp; habitats</b></p> 	<p>They know about <b>similarities and differences</b> between themselves and others, and among families, communities and traditions. <b>They can talk</b> about their own environment.</p> <p>The world: Show care and concern for living things and the environment</p> 	<ul style="list-style-type: none"> <li>Name common plants and <b>describe</b> the basic structure of flowering plants, including trees.</li> </ul> <p><b>(Plants)</b></p> <p><b>(Animals including humans)</b></p> <p><b>Identify</b> and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p><b>Identify</b> and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p><b>Describe and compare</b> the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including</p>	<p><b>Explore and compare</b> the differences between things that are living, dead, and things that have never been alive. <b>Identify</b> that most living things live in habitats to which they are suited and <b>describe</b> how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other <b>Identify</b> and name a variety of plants and animals in their habitats, including microhabitats <b>Describe</b> how animals obtain their food from plants and other animals, using the idea of a simple food chain, and <b>identify</b> and name different sources of food.</p> 
<p><b>Key Vocabulary</b></p>	<p>Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade. Natural, animal, leaves, seeds, conkers, acorns, twigs, bark, shells, feathers, pebbles, stones, same, different, pattern, vegetable, herb, weed, animal, names of plants and animals they see, names of a contrasting environments (e.g. beach, forest).</p>	<p>Living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland, names of micro habitats e.g. under logs, in bushes etc. Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals from each vertebrate group.</p>	<p>Living, dead, never alive, habitats, micro-habitats, food, food chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, conditions, desert, damp, shade, water, air, survive, survival, names of local habitats (e.g. pond, woodland etc.), descriptions of micro-habitats (e.g. under logs, in bushes etc.), conditions, light, dark, shady, sunny, wet, damp, dry, hot, cold, names of living things in the habitats and micro-habitats studied.</p>
<p><b>Key Indicators</b></p>	<p>Can find a range of items which are dead or living. Can name plants/animals which live in different habitats and micro habitat. Can talk about the features of the animal/plant and how they are suited to the habitat.</p>	<p>Can find a range of items which are dead or living. Can name plants/animals which live in different habitats and micro habitat. Can talk about the features of the animal/plant and how they are suited to the habitat.</p>	<p>Can find a range of items which are dead, living or have never been alive. Can name plants/animals which live in different habitats and micro habitats including biomes. Can talk about the features of the animal/plant and how they are suited to the habitat.</p>
<p><b>Sticky Knowledge</b></p>	<p>Can talk about the differences between living and dead. Knows animals need food to survive.</p>	<p>There are many different animals with different characteristics. Animals have senses to help their survival. When animals sense things they are able to respond. Animals need food to survive. Animals need a variety of food to help them grow, repair their bodies, be active and stay healthy.</p>	<p>Animals move in order to survive. Different animals move in different ways to help them survive. Exercise keeps animal's bodies in good condition and increases survival chances. All animals eventually die. Some animals hibernate during the winter months. Animals reproduce new animals when they reach maturity. Animals grow until maturity and then do not grow any larger.</p>

Year Group	EYFS	Year 1	Year 2
<p><b>Materials</b></p> 	<p><u>Moving and handling</u>- Introduce and encourage children to use the vocabulary of manipulation, e.g. squeeze and prod.</p> <p><u>The world</u>: Can <b>talk</b> about why things happen and how things work.</p> <p><u>Exploring media and materials</u>- <b>notice</b> changes in properties as they are transformed through becoming wet, dry, flaky or fixed. <b>Think</b> about cause and effect.</p>	<p>Distinguish between an object and the material from which it is made.</p> <p><b>Identify</b> and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. <b>Describe</b> the simple physical properties of a variety of everyday materials.</p> <p><b>Compare</b> and <b>group together</b> a variety of everyday materials on the basis of their simple physical properties.</p> 	<p><b>Identify and compare</b> the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</p> <p><b>Find out</b> how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> 
<p><b>Key Vocabulary</b></p>	<p>Wet, dry, shiny, dull, bendy, stiff, squashy, hard/soft, lumpy, wrinkly, smooth, rough, mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, wobbly, wood, plastic, paper, card, fabric, ice, water, frozen, icicle, snow, melt, wet, cold, slippery, big, bigger, biggest, smaller, smaller, smallest, bendy, rigid, wood, plastic, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back.</p>	<p>Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through.</p>	<p>Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff, rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching translucent, reflective, nonreflective, shape.</p>
<p><b>Key Indicators</b></p>	<p>They can talk about simple similarities and differences between two materials.</p>	<p>Can label a picture/diagram of an object made from different materials. Can describe the properties of materials. Can sort materials using their properties. Can test evidence to answer a question.</p>	<p>Can name an object, say what material it is made from, identify properties and make a link between property and use. Whilst changing a shape of an object can describe the actions used. Can use suitable vocabulary. Simple tests relevant to properties. Describe similarities and differences.</p>
<p><b>Sticky Knowledge</b></p>	<p>Can identify differences between materials. Can talk about simple properties.</p>	<p>Can identify and talk about different materials and their properties. Can use their knowledge of properties to sort materials into groups.</p>	<p>Can identify and talk about different materials and their properties using scientific vocabulary such as transparent and waterproof. Can use their knowledge of properties to sort materials into groups. Can perform simple tests to determine material suitability and begin to record their findings.</p>

Year Group	EYFS	Year 1/Year 2
<b>Seasonal Changes</b>  	<p>They show concern and care for the environment and can <b>notice</b> changes and differences. Develops an understanding of decay and changing over time.</p> 	<p><b>Observe</b> changes across the four seasons. <b>Observe</b> and <b>describe</b> weather associated with the seasons and how day length varies.</p> 
<b>Key Vocabulary</b>	<p>Snow, wind, rain, sun, day, night, stormy, cloudy, hot cold, foggy.</p>	<p>Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) sun, sunrise, sunset, day length, raining, shower, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, sun, sunrise, sunset.</p>
<b>Key Indicators</b>	<p>Can describe the weather outside and suggest what they might wear and what they might see. Can comment on the environment e.g. the leaves have fallen off the tree, there is a puddle.</p>	<p>Can name four seasons and identify when in the year they occur. Can observe and describe weather in different seasons. Can describe days being longer in summer and shorter in winter. Present data in tables charts and compare seasons.</p>
<b>Sticky Knowledge</b>	<p>Understand that the weather changes according to the time of year.</p>	<p>Understand that the weather changes according to the time of year and can identify and discuss the signs of the different seasons. Eg leaves changing colour in Autumn and new growth in the Springtime.</p>
<p>The teaching of the seasons and weather occurs throughout the school year and is revisited on a regular basis including through daily discussions of observations of what is happening in the natural world.</p>		