

Curriculum Overview

At Elmfield School we aim to produce enquiring and imaginative scientists.

Up until Class 4 the teaching and learning of scientific skills and knowledge is embedded across the curriculum rather than as a distinct discipline, from 'tidy time' that teaches classification to the youngest children in Kindergarten to testing out den building ideas in Class 2, although specific scientific concepts are gradually taught more explicitly in Main Lessons such as Food and Farming, Measurement or Building in Class 3.

Our youngest pupils will start from a real experience of phenomena and will be encouraged to create and ask their own questions about the world around them. Initially they will be encouraged to supply their own supposed answers to questions such as 'Why is the sky blue?' or 'Where does the sun go at night?' engaging their imaginative and independent responses to their experience. We feel it is important that as they develop, our pupils can distinguish between what they know themselves (because they have observed, enquired, thought about and applied their current knowledge to what they have seen), and what they have simply been told.

*We want our science teaching to be experiential, inquisitive and imaginative because **independent and imaginative thinking creates innovative scientists.***

The curriculum shows the key scientific skills each child has met and engaged with across each 2 year period in school (KG-Class1, Class 2-3 and Class 4-5), corresponding with the key skills of the National Curriculum Stages 1 and 2.

Suggested content is broken down into key areas that can correspond to the traditional scientific disciplines:

The Living World (Life Science - including plants, animals, humans and the environment)

Transformation (Chemistry – exploring the changes in materials)

Working with Materials and (Physics – exploring how materials behave and can be used in different circumstances)

Each area is presented with learning opportunities for the pupils, alongside indications for teaching opportunities. It is not expected that all areas are covered in the manner suggested and each teacher should add to or modify these indications as they teach each block.

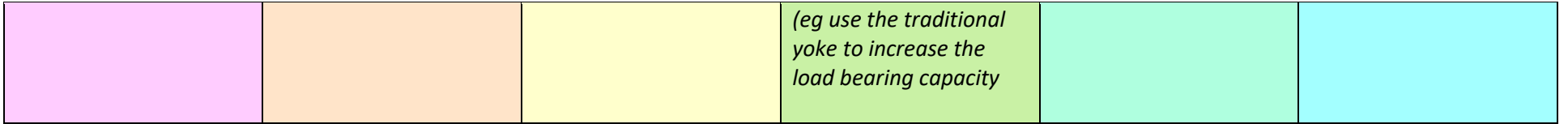
Kindergarten	Class 1	Class 2	Class 3	Class 4	Class 5
<p><i>KG and Class 1</i></p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • enquiry- question making • observation skills (the children observe the natural world at close quarters – bugs, tadpoles, flowers etc.) • testing ideas • identifying, classifying, sorting (Opportunities for grouping and classifying are provided as part of real work) • extrapolating from observation to suggest answers • gathering and recording data • understanding the significance of accurate measurement (Children learn to understand the importance of using the same measure e.g. cups when measuring. They also use balance scales 	<p><i>KG and Class 1</i></p> <p><i>Key Skills:</i></p> <ul style="list-style-type: none"> • enquiry- question making • observation skills (the children observe the natural world at close quarters – bugs, tadpoles, flowers etc.) • testing ideas • identifying, classifying, sorting (Opportunities for grouping and classifying are provided as part of real work) • extrapolating from observation to suggest answers • gathering and recording data • understanding the significance of accurate measurement (Children learn to understand the importance of using the same measure e.g. cups when measuring. They also use balance scales 	<p><i>Class 2 & 3</i></p> <p><i>Additional Key Skills:</i></p> <ul style="list-style-type: none"> •enquiry – using different types of enquiry to answer Qs • devising tests for ideas • measured, systematic observation using basic equipment • purposefully gathering, recording and classifying data in a variety of ways • recording findings with simple scientific language; drawings, labels, keys, bar charts, tables etc • reporting on findings (oral, written, presentations, etc) • arriving at simple, predictions, modifications and further steps to enquiries • identifying differences, similarities 	<p><i>Class 2 & 3</i></p> <p><i>Additional Key Skills:</i></p> <ul style="list-style-type: none"> •enquiry – using different types of enquiry to answer Qs • devising tests for ideas • measured, systematic observation using basic equipment • purposefully gathering, recording and classifying data in a variety of ways • recording findings with simple scientific language; drawings, labels, keys, bar charts, tables etc • reporting on findings (oral, written, presentations etc) • arriving at simple predictions, modifications and further steps to enquiries • identifying differences, similarities 	<p><i>Class 4 & 5</i></p> <p><i>Additional Key Skills:</i></p> <ul style="list-style-type: none"> • planning different types of enquiry to answer questions, including working with variables • taking increasingly accurate and precise measurements with a range of equipment • recording data using increasingly complex tables, graphs and other appropriate methods • using results to predict and extend enquiry • reporting and evaluating findings in a variety of ways • identifying previous evidence to support or refute ideas or arguments 	<p><i>Class 4 & 5</i></p> <p><i>Additional Key Skills:</i></p> <ul style="list-style-type: none"> • planning different types of enquiry to answer questions, including working with variables • taking increasingly accurate and precise measurements with a range of equipment • recording data using increasingly complex tables, graphs and other appropriate methods • using results to predict and extend enquiry • reporting and evaluating findings in a variety of ways • identifying previous evidence to support or refute ideas or arguments

<p>and will begin to understand about mass)</p> <ul style="list-style-type: none"> • <i>Appropriate use of equipment</i> (The children use tools and soft technology Sawing, drilling, sewing all require careful and accurate work) 	<p>and will begin to understand about mass)</p> <ul style="list-style-type: none"> • <i>Appropriate use of equipment</i> (The children use tools and soft technology Sawing, drilling, sewing all require careful and accurate work) 	<p><i>or changes related to simple scientific ideas and processes</i></p> <ul style="list-style-type: none"> • <i>using scientific evidence to answer questions or support findings/ideas – “I can tell that because...”</i> 	<p><i>or changes related to simple scientific ideas and processes</i></p> <ul style="list-style-type: none"> • <i>using scientific evidence to answer questions or support findings/ideas – “I can tell that because...”</i> 		
<p>KG Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: Children can recognise and name common plants and trees (eg the nettle, the daffodil, the rose, the snowdrop, the oak tree, the Rowan, the fir tree); can recognise and avoid most common toxic plants; learn about wheat by planting, growing and harvesting wheat and noticing the grain, stalks and flour – make bread and use stalks for craft work.</p> <p><i>Teaching opportunities: outdoor walks, outdoor</i></p>	<p>Class 1 Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: observation of common local plants and trees through the year; drawing, recording leaf shapes; leaf lanterns, dyes, soups and cordials, hedgerow jam</p> <p><i>Teaching opportunities: weekly outdoor lesson, craft lessons</i></p> <ul style="list-style-type: none"> • Animals, including humans <p>Learning opportunities: Basic life cycles (frogs), question making and imaginative responses</p>	<p>Class 2 Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: extend knowledge of local and common plants and trees. Cultivate, grow and harvest at least one basic vegetable (eg potatoes or onions) in outdoor lesson</p> <p><i>Teaching opportunities: Song of the Seven Herbs; holistic Native American approach to natural world; ecology: outdoor lesson, looking at soil, cultivation, seed planting</i></p>	<p>Class 3 Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: food production, the food cycle, types of food (root, grain, nut, legume, leaf, fruit etc); crop rotation and soil health; appropriate use of plants (fuel, building, feed); fertiliser (chemical/organic/mineral components of soils), worms; nutrition/healthy eating</p> <p><i>Teaching opportunities: Food and Farming Main Lesson block; local walks and visits;</i></p>	<p>Class 4 Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: grow a wider variety of crops in class garden. Begin close observation of the different ways plant structures enable them to gain light, air, water and minerals (leaf and stem shape, colour and texture etc). Question making</p> <p><i>Teaching opportunities: weekly outdoor lesson with more specifically directed content and training of observation skills.</i></p>	<p>Class 5 Suggested Content</p> <p><i>The Living World</i></p> <ul style="list-style-type: none"> • Plants <p>Learning opportunities: explore plant structures in detail across a range of plants. Look at the ‘hierarchy’ of plants across an evolutionary range (eg fungi, algae, ferns, conifers, flowering plants etc) decide on a range of features to compare and contrast the different groups; practise and develop Goethean observation skills, and develop a range of methods for recording those</p>

<p><i>play, plant bulbs for gifts, plant wheat</i> <i>Teach about poisonous plants</i> <i>Make Autumn strings</i> <i>Seasonal stories, poems and activities (eg rose hip syrup, nettle soup, leaf mobiles etc)</i></p> <p>• Animals, including humans Learning opportunities: Children can recognise group and classify common animals (eg wild, farm, pet, cat/dog etc) and will know basic behavioural characteristics. Observe life cycles of caterpillars and butterflies. Make bird feeders and observe birds. <i>Teaching opportunities: stories, poems, songs, activities, active play, wooden animals</i></p> <p>• The environment Learning opportunities: Children experience seasonal changes through outdoor walks and play, stories, crafts and activities. Children notice some changes take place over a long time, and can be regular, while other</p>	<p>to natural observations (eg 'how the blackbird got his beak', 'why the spider makes his web'), play. <i>Teaching opportunities: Curriculum embedded in specific main lesson blocks on 'The world Around Us' based in artistic and imaginative responses to the local natural world through the year as well as in daily 'rhythm time' activities through the year. Nature stories using imaginative narratives for natural phenomena to heighten observation and connection ('how the blackbird got his golden beak' etc). Birthday verses using animal characteristics</i></p> <p>Transformation Learning opportunities: wax modelling, structure making with knitting and felt making <i>Teaching opportunities: handwork and craft lessons</i></p> <p>Working with Materials Learning opportunities: craft and handwork: wool, wood, making</p>	<p>• Animals, including humans Learning opportunities: extend knowledge and understanding of characteristics, life cycles and habitats of common animals (eg the fox, common birds, nests and eggs etc) <i>Teaching opportunities: Fables, drawing out comparisons and contradictions; outdoor lessons looking at nests, pond life, pond dipping, healthy (and unhealthy) habitats</i></p> <p>•The environment and transformation Looking at cardinal directions and the spin of the earth, place of the sun, the reasons for night and day etc, changes in the moon, and recognising the most basic constellations through story from other cultures.</p> <p>Working with Materials Learning opportunities: den building, teepees and tents; the fitting of form to function in fable stories <i>Teaching opportunities:</i></p>	<p><i>growing and grinding wheat; worm farm; experimenting with fertilising crops in outdoor lesson, foraging for seasonal wild food in outdoor lesson</i></p> <p>• Animals, including humans Learning opportunities: food production; domestic animals kept for different purposes (meat, milk, wool, hide, breeding, eggs, honey etc); care of animals in farming; life cycles; human relationships to animals <i>Teaching opportunities: Food and Farming ML; visits and talks; hatching eggs (hens/butterflies)</i></p> <p>Transformation Learning opportunities: food production; changing states via heating, effects of adding acids and bases ((curd cheese, natural elderberry inks/juices etc); show reactions and by-products (milk to butter & buttermilk,</p>	<p>• Animals, including humans Learning opportunities; close observation of animal specialisms and handicaps; explore and evaluate classification systems (eg air, land, earth and sea animals, or head trunk, limb animals, etc); gain an understanding of the relationship between habitat, form and function; specific animal project and presentation <i>Teaching opportunities: Human and Animal ML block; use our own physical bodies to predict animal shape and strength, use real animals where possible, possibly with dissection (fish, for example); show and tell with pets</i></p> <p>• The environment Learning opportunities: examine how habitat encourages animal specialisms; food chains and dependencies; environmental change and the effect on the living world. Explore local environment for clues</p>	<p>observations in a comparative way. Dissect and record exploration of fungi or similar plant material with magnification. Understand the life cycles of various plants and examine different ways of pollinating, and the dependency on environmental or biological factors for propagation. Describe the plant life of a range of biomes, including desert, tundra, forest etc, and understand the relationship between environment and plant life.</p> <p><i>Teaching opportunities: Botany ML block; local field trips; observation and dissection of plants and fungi in and outside the classroom.</i></p> <p>• Animals, including humans Learning opportunities: Relationships of plants, animals and environment for the 'web of life' (Possible second 'Human and Animal' ML block extending Class 4 work)</p>
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<p>changes can be quick and unique. <i>Teaching opportunities: specific guided observations into seasonal changes and characteristics, nature table displays, seasonal songs, poems and activities, seasonal foods etc</i></p> <p>Transformation & Working with Materials Learning opportunities: children build in both indoor and outdoor play and can make sturdy structures with appropriate use of natural materials, from wood to muslin cloths; sand and water play, crafting activities; woodwork, felting, paper craft, beeswax modelling; cooking and baking (bread, soup etc); candle dipping; recycling old wax to make new candles; Oldest children make kites, dolls, wooden boats and felt sails with appropriate material and tools. Teaching opportunities: demonstration of crafts and provision of</p>	<p>knitting needles; outdoor play with natural materials; working with soil, gardening tools; fire making <i>Teaching opportunities: introducing process and method</i> <i>The weekly outdoor lesson includes elements of gardening as well as woodland play; digging, clearing, planting, cultivating and harvesting basic foodstuffs and flowers.</i></p>	<p><i>Active American stories, fables, outdoor lessons</i></p>	<p>use non-homogenised milk to learn about molecules sizes, observation of the separation of cream etc with correct vocabulary) <i>Teaching opportunities: Food and Farming ML, making butter and curd cheese, making ink with seasonal materials, explorations and observations of different sized materials (eg corn, rice, caster sugar) shaken in a jar, and mixing dyed oil and water and watching the separation); cooking and bread making</i></p> <p>Working with Materials Learning opportunities: what keeps a structure up? What keeps it safe? Appropriate materials and techniques for structure building. Use bridge building/cathedral building to explore load, mass, gravitational force. Explore balance and weight bearing. Explore how to split and spread loads; look at traditional techniques and see how these are still used in modern steel frame structures.</p>	<p>about its development, from local factors and materials. Basic navigation(land, sea and stars) and examination of the northern seasons, reasons for long dark winters <i>Teaching opportunities: Human and Animal ML, Local Geography ML)(use for development of question making ('what a clues? How can we tell? What are we looking for? What can that tell us? What else do we need to find out to be sure?'); use of evidence and data; basic field trip discipline and skills; planning for enquiry; Viking theme for navigation skills;</i></p> <p>Transformation Learning opportunities: initial exploration of the effect of change in environmental factors on the living world, and possible solutions for the future; problem solving <i>Teaching opportunities: Human and Animal ML; experiment with simple Ph levels on water from basic household good</i></p>	<p><i>Teaching opportunities: Local walks and observations. Botany ML (Possible second 'Human and Animal' ML block extending Class 4 work)</i></p> <p>•The environment Learning opportunities: observing the qualities and uses of water in its different states, through the courses and action of rivers; flow and erosion; the effects of ice on rock; coastal waters, erosion and breakwaters; causes and effects of tides. Uses of water in industry and growth of settlements. Soils, climates and habitats suitable for different types of plants and fungi.</p> <p><i>Teaching opportunities: Geography of Britain ML Botany ML</i></p> <p>Transformation Learning opportunities: Observing properties of water in different states</p>
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<p>materials; cooking and baking time</p>			<p>Explore how building must take account of local & seasonal stresses and conditions. Look at transformational crafts such as blacksmithing and metal work, felting etc. Look at local materials and fuel sources influencing local crafts (eg charcoal making). Explore the necessity for accuracy in measurement, appropriate scaling, careful data collection. Question making – what do we need to know/do next? What do we guess and how can we test this? Problem solving. <i>Teaching opportunities: building main lesson block, experiments with loads and structures, building with different materials, look at traditional techniques; visit the Minster to look at the masons’ loft etc; visit Ryedale Folk Museum to look at the properties of cruck frame construction for load bearing. In Measurement ML look at weights and balances as a physical property</i></p>	<p><i>and how that affects living material; experiments and demonstrations to show how easily environments and habitats can change; importance of water and specialised foodstuffs (eg pandas and bamboo); not all transformation is positive. Problem solving activities.</i></p> <p>Working with Materials Learning opportunities: explore local materials; explore how local rocks/minerals/resources have shaped development and the story of place. <i>Teaching opportunities; Local Geography ML</i></p>	<p>- prediction/observation/ recording and modification of prediction. Changing plant material into fabric or paper Making plants edible – processing</p> <p><i>Teaching opportunities Geography ML, experiment with ice in rock; observe how water expands as it freezes and draw out predictions about how that works on the land. Botany ML – cooking with plants, observing changes eg cooking fungi to release hidden water content, or broccoli to break down stem material</i></p> <p>Working with Materials Learning opportunities: Use of plants for fabric, paper, rope etc <i>Teaching opportunities: Craft work - paper making, spinning, rope making etc</i></p>
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