

THE VAYNOR CURRICULUM

SCIENCE SEQUENCE



INTENT



Love for Learning:

Children will develop a love for science and discovery. They will show curiosity to explain the world around them. Children will learn systematic ways to approach answering their own questions, become problem solvers and build resilience when approaching tasks and investigations.



Enquiring Minds:

Children will build strong scientific enquiry skills. They will now how to ask questions, observe, predict, measure, classify and communicate their learning in science.



World Wise:

Children will understand and respect the world in which they live. They will know how to take care of and sustain it. They will have a fascination for it that will remain with them for the rest of their lives.

	Working Scientifically	Biology	Physics/Chemistry
EYFS	<p>Observing and making links, noticing patterns in their learning and begin to give reasons why changes they observe occur.</p> <p>Developing ideas of grouping, sequences, cause and effect.</p> <p>Comment and ask questions.</p> <p>Select and use a range of scientific equipment.</p> <p>Make predictions based on what they observe and draw on prior knowledge.</p> <p>To investigate and ask questions about the world around them.</p>	<p>To discuss that certain animals live in the school grounds/local area and name some common animals and insects: hedgehog, squirrel, rabbit, fox, minibeasts, birds etc.</p> <p>To name some animals and classify them.</p> <p>To understand how certain animals, grow and sequence the growth patterns of a butterfly and chick.</p> <p>To name key parts of an animal.</p> <p>To begin to understand camouflage.</p> <p>To know that a plant is a living thing and recognise and name parts of a plant.</p> <p>To understand how certain plants grow and sequence the growth patterns of a bean.</p> <p>To begin to understand what impact humans have on animals and their environments.</p>	<p>To use all their senses in exploration of natural materials.</p> <p>To explore collections of materials with similar and/or different properties.</p> <p>To talk about the differences between materials and changes they notice and know that certain materials can be hard/ solid/ soft.</p> <p>To explore how and begin to understand why certain materials are better to use for different things.</p> <p>Experiment with magnets and use this to sort what is or isn't metal.</p> <p>To notice and talk about what happens to puddles when it's cold and begin to understand that when water gets cold enough it freezes and becomes ice. Begin to understand that when ice warms up it melts and changes back to water.</p> <p>To identify and sort different materials to be recycled.</p>

Year 1	<p>Use different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping, and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.</p> <p>Ask simple questions and listen to the answers. Begin to observe closely, using simple equipment. Identify and classify objects.</p> <p>Use their observations and ideas to suggest answers to questions.</p> <p>Gather and record data to help in answering questions.</p>	<p>Animals including Humans: 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.</p> <p>Plants: 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> <p>Seasonal Changes: Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.</p>	<p>Materials 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>
Year 2	<p>Use different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping, and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information.</p> <p>Ask simple questions and recognise that they can be answered in different ways. Observe closely, using a variety of simple equipment. Perform simple tests to help with identifying and classifying. Use their observations and ideas to suggest answers to questions and any further questions they may have.</p>	<p>Living things and their habitats: 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 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.</p>	<p>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, and stretching.</p>

	<p>Gather and record data to help in answering questions, communicating their findings in a variety of ways.</p>	<p>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.</p> <p>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.</p>	
Year 3	<p>Ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping, and classifying things, carrying out simple comparative and fair tests and finding things out using secondary sources of information.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions. Identify differences, similarities or changes related to simple scientific ideas and processes. Use straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Plants: Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Animals including Humans: 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> <p>Rocks: 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</p>	<p>Light: Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change.</p> <p>Forces and Magnets: 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>

		when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.	
Year 4	<p>Ask their own questions about what they observe and make some decisions about which types of scientific enquiry are likely to be the best ways of answering them, including observing changes over time, noticing patterns, grouping, and classifying things, carrying out simple comparative and fair tests and finding things out using secondary information sources.</p> <p>Set up simple practical enquiries, comparative and fair tests.</p> <p>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions.</p>	<p>Living things and their habitats:</p> <p>Recognise that living things can be grouped in a variety of ways.</p> <p>Explore and use classification keys to help groups identify and name a variety of living things in their local and wider environment.</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things.</p> <p>Animals including Humans:</p> <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators, and prey.</p>	<p>Sound:</p> <p>Identify how sounds are made, associating some of them with something vibrating.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it.</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases.</p> <p>Electricity:</p> <p>Identify common appliances that run on electricity.</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches, and buzzers.</p> <p>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.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.</p> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <p>States of matter:</p> <p>Compare and group materials together, according to whether they are solids, liquids, or gases.</p> <p>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).</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>

Scientific Vocabulary

EYFS	Year 1	Year 2	Year 3	Year 4
<p>head, body, eyes, ears, mouth, teeth, leg, tail, wing, feathers, fur, beak.</p> <p>Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue</p> <p>Leaf, flower, blossom, petal, fruit, root, seed, trunk, stem, bar, bud</p> <p>Names of vegetables and wild flowering plants in the school garden</p> <p>material, wood, plastic, glass, metal, water, paper, card/cardboard, wool, clay, hard, soft, stretchy, bendy, floppy, waterproof, rough, smooth, shiny, see-through, not see-through.</p> <p>Weather (sunny, rainy, windy, snowy etc.)</p> <p>Seasons (winter, summer, spring, autumn)</p> <p>Sun, day length, night, cold, warm, hot</p>	<p>Animals including Humans.</p> <p>head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</p> <p>Names of animals</p> <p>experienced first-hand from each vertebrate group</p> <p>Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue</p> <p>Plants</p> <p>Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud</p> <p>Names of trees in the local area</p> <p>Names of garden and wild flowering plants in the local area</p> <p>Everyday Materials</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, opaque, transparent</p> <p>Seasonal Changes Weather</p>	<p>Animals including Humans.</p> <p>Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)</p> <p>Living Things and their Habitats</p> <p>Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed</p> <p>Names of local habitats e.g. pond, woodland etc.</p> <p>Names of micro-habitats e.g. under logs, in bushes etc.</p> <p>Plants</p> <p>As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy</p> <p>Everyday Materials</p> <p>Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard</p> <p>Properties of materials – as for Year 1 plus reflective, non-reflective, flexible, rigid</p> <p>Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching</p>	<p>Animals including Humans.</p> <p>Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints, Contract, shortening, extend, healthy, unhealthy, balance, moderation, energy, function., exoskeleton, endoskeleton</p> <p>Living Things and their Habitats</p> <p>Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats, producers, primary consumer, secondary consumer, tertiary consumer</p> <p>Plants</p> <p>Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), nutrients, air, light, life cycle, predator, drought</p> <p>Rocks</p> <p>Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil, loamy, silt, Particles, profile, humus, bedrock, parent substance, subsoil, topsoil, fragment, organic, Metamorphic, igneous,</p>	<p>Animals including Humans.</p> <p>Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, wisdom teeth, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain, food web</p> <p>Living Things and their Habitats</p> <p>Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p> <p>Sound</p> <p>Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p> <p>Electricity</p> <p>Electricity, electrical appliance/device, mains, plug, Electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal,</p> <p>States of Matter</p> <p>Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle, condensation</p>

	(sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length		sedimentary, pressure, plates (tectonic). Forces and Magnets Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole, gravity, magnetic field, friction, surface, distance, measure, resistance. Light Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, torch, natural light source, absorbed, reflection.	
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SMSC in Science

Spiritual	Social
<p>Providing opportunities to wonder what is special about life, an awe at the scale of living things from the smallest microorganism to the largest tree and interdependence of all living things and materials on Earth.</p> <p>Reflection and the emotional drive to know more and to wonder about the world and aesthetically appreciate its wonders including, for example the enormity of space and the beauty of natural objects or phenomenon, plants, animals, crystals, rainbows and the Earth from space etc.</p> <p>Promoting teaching styles which: value pupils' questions and give them space own thoughts, ideas, and concerns; enable pupils to make connections between aspects of their learning; encourage pupils to relate their learning to a wider frame of reference – for example, asking why, how, where as well as what?</p> <p>Showing respect for the different opinions expressed by others, for example regarding creation.</p>	<p>Encouraging pupils to work co-operatively and develop team working skills in practical work and to share the results to improve reliability.</p> <p>Developing team working skills and taking responsibility in that team.</p> <p>Pupils take responsibility for their own and others' safety.</p> <p>Consideration of the benefits and drawbacks of scientific and technological developments and the social responsibilities.</p>
Moral	Cultural

Encouraging pupils to take responsibility for their actions; for example, in respect of property, care of the environment and developing codes of behaviour.
Encouraging pupils to become increasingly curious, to develop open mindedness to suggestions of others and to make judgements on evidence not prejudice.
Encouraging children to use their understanding of the world in a positive manner.
Begin to understand that moral dilemmas are often involved in scientific developments.
When considering the environment, the use of further natural resources and its effect on future generations is an important moral consideration.

Thinking of scientific discoveries as part of our culture as great as music and films with credit given to scientific discoveries made by other cultures.
Science is seen as a contemporary activity with developments being made all over the modern world by both men and women in many different cultures (now and in the past).
Investigating the historical impact of scientists from around the world.

British Values

Pupils should learn how citizens can influence decision making for example human impact on the environment or through P4C questions 'Does deforestation matter?'.
Develop the ability to take full and active part in practical lessons but keeping to the rules to keep safe and others safe.
Respect the views of others (and freedom of others to hold different beliefs) for example in issues such as genetically modified crops or the impact of pollution.