



# NEWARK HILL ACADEMY

## Science

### Pedagogy

Pre-Assessment – Concept map – Knowledge – Working Scientifically- Post Assessment – Concept map revisit

### Types of enquiry

Classification

Observation over time

Pattern seeking

Comparative / fair testing

Research

### Working scientifically

#### KS1

During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes, and skills through the teaching of the programme of study content:

- 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.

#### Lower KS 2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes, and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying, and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and

#### Upper KS2

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes, and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising, and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar, and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting 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
- identifying scientific evidence that has been used to support or refute ideas or arguments

	raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings.	
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**Scientists to be covered \*\*Where appropriate**

<b>EYFS</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>
	George Mottershead	Charles Macintosh	Mary Anning Marie Currie	Washington Sheffield Libbie Hyman	Isaac Newton	Carl Linnaeus Charles Darwin Thomas Eddison Marie Maynard Daly



# Biology

## Plants

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Observe plants in their immediate Environment grouping and classifying them using their own criteria.</p> <p>Pupils will identify and begin to name a few plants around them.</p>	<p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</p> <p>Pupils will identify and describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Pupils will find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Know, identify and describe the functions of different parts of the flowering plants: roots, stem/trunk, leaves, and flowers.</p> <p>Know the requirements of a plant's growth (air, light, water, nutrients and room to grow) and how they vary plant to plant.</p> <p>Through investigation, know the way in which water is transported within plants.</p> <p>Pupils will know and explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p>	<p>Recognise living things can be classified in a variety of ways.</p> <p>(Living things and habitats)</p>	<p>Describe the differences in lifecycle of a mammal, amphibian, an insect, and a bird.</p> <p>(Living things and habitats)</p>	<p>Describe how living things are classified in broad groups according to common observable characteristic and based on similarities and differences, including microorganisms, plants, and animals.</p> <p>Give reasons for classifying plants and animals based on specific characteristic (Living things and habitats)</p>

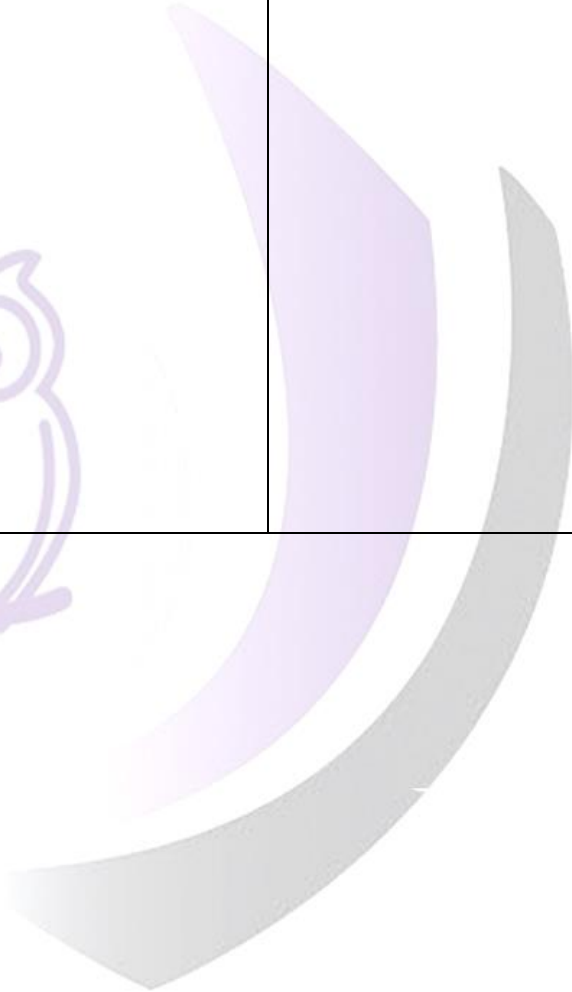
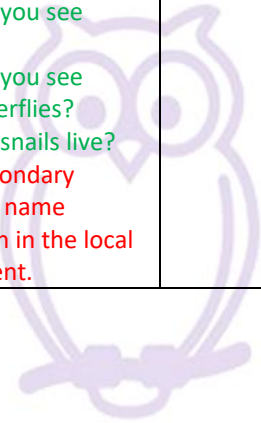
Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plant tree flowers petal leaves roots soil water sun	Wild weed garden plant deciduous evergreen roots stem leaves flowers petals roots fruit seed bulb	Sprout seed shoot sunlight water sun nutrition temperature conditions germinate lifecycle	Roots, stem, leaves anchor nutrition nutrients, flowers germination absorb petal stigma carpel style ovule stamen filament anther seed dispersal fertilisation pollination pollinator	Classification (keys), environment, habitat, human impact, migrate, hibernate <i>(Living things and habitats)</i>	Lifecycle, mammal, amphibian, germination, seed formation, insect, bird pollination, life processes plants, animals, reproduction, environment, dispersal, growth, living, eggs, and seeds. <i>(Living things and habitats)</i>	Vertebrates, fish and amphibians, reptiles, birds, mammals, invertebrates, insects, flowering, and non- flowering. <i>(Living things and habitats)</i>
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To classify plants according to observable features. Observe over time how plants grow over the year.	To classify parts of plants using similarities and differences. Observe over time how plants grow over the year. To seek patterns based on observations- i.e. Do bigger trees have bigger leaves? Comparative and fair testing- to see the best condition for plant growth. To research name of plants using secondary resources.	Classify based on children's own criteria for seeds and bulbs. Observe over time to plant seeds and bulbs and observe how they grow. Seek patterns through generating questions for investigations such as: Does it matter which way round you plant a bulb or seed? Which comes first, the root or the shoot? Do big seeds germinate more quickly? Comparative and fair testing- place plants in different conditions	Observe over time how coloured water is transported through stem of a celery/ / white carnations. Observe over time seed and photograph evidence of blossoms/ flowers and berries on a trail throughout the year. To seek patterns when investigating what happens when conditions changed. To research the functions of the parts of flowering plants, different methods of dispersal and different methods of pollination	<i>(See Living things and habitats)</i>	<i>(See Living things and habitats)</i>	<i>(See Living things and habitats)</i>

## Living things and their habitats

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils will name animals in their environment. Pupils will learn about the Lifecycle of chicks by having chicks in the classroom.</p> <p>Pupils will know similarities and differences between themselves and others, among families, communities and traditions. They can talk about their own environment. Pupils will know how to show care and concern for living things and the environment.</p>	<p>Pupils will know the names of common plants and describe the basic structure of flowering plants, including trees. <b>(plants)</b></p> <p>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. <b>(Animals including Humans)</b></p>	<p>Pupils will explore and compare the differences between things that are living, dead and things that have been never alive.</p> <p>Pupils will identify that most living things live in habitats to which they are suited and describe how different kinds of animals and plants, how they depend on each other.</p> <p>Pupils will identify and name different sources of food, linking to the lifecycle of animals i.e. the story The Last Wolf.</p>	<p>Pupils will know, Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. <b>(plants)</b></p>	<p>Pupils will know that living things can be grouped in a variety of ways.</p> <p>Pupils will know and can name living things in a range of habitats. Pupils will know and can relate the key adaptational features of an organism to the known features of its habitat.</p> <p>Pupils will know and can give examples of how an environment may change both naturally and due to human impact.</p>	<p>Pupils will describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.</p> <p>Pupils will describe the life processes of reproduction in some plants and animals.</p>	<p>Pupils will know how to classify living things into broad groups according to common observable characteristics and based on similarities and differences and based on similarities and differences, including micro-organisms, plants and animals.</p> <p>Pupils will know how to give reasons for classifying plants and animals based on specific characteristics.</p>

Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Lifecycle egg hatch chicks growing, baby,	(See plants) (See Animals including Humans)	Living, dead never alive life processes food chain habitats microhabitats survive	(See plants)	Organisms life processes respiration reproduction excretion nutrition habitat environment endangered species extinct vertebrate invertebrate's specimen characteristics classification	Lifecycle , mammal, amphibian germination seed formation insect bird pollination life processes plants animals reproduction environment dispersal growth living eggs seeds	Key characteristic classification dichotomous taxonomist bacteria microorganisms' germs fungi species virus
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To sort animals in own chosen criteria-i.e. furry not furry. Observe over time chicks hatching	(See plants) (See Animals including Humans)	To classify things to whether they are living, dead or were never alive. To classify how to group different living things. To classify how to group different living things. To classify different plants found in the environment. Observe over time to explore animals in microhabitats throughout the year (under a rock, under a log, in a pond, in a bush, in the long grass) Observe over time to explore plants in	(See plants)	To classify based on pupil's own criteria, classify a number of living things in the local, wider environments and introduce branching databases/dichotomous keys. Observe over time living things in their local environment at different times of the year. To seek patterns Do animals with . have ...? Do plants with ... have...? To research and be able to name plants and animals in the wider environments e.g. polar, desert, jungle. To research global	To classify animals according to their life cycle. Observe over time grow from cuttings and observe whether they grow, roots, stem, leaf/ flower. Observe over time grow from harvest, bulbs through the year and observe strawberry/spider plats through the year. To seek patterns where children generate questions such as Do larger mammals have longer gestation periods? Do larger animals live longer? Do smaller animals lay more eggs? Research and generate	To classify animals according to Carl Linnaeus system. To classify plants into flowering, mosses, ferns and conifers, based on specific characteristics To classify by using dichotomous key to classify a set of living things. Research the characteristics of a vertebrate/ invertebrate. Research the difference between bacteria, virus and fungi to give reasons why these are not plants or

		<p>microhabitats throughout the year (under a rock, under a log, in a pond, in a bush, in the long grass"</p> <p>To seek patterns through generating questions for investigations such as:          Are there more daisies in the meadows than the field?          Where do you see more Ivy?          Where do you see more butterflies?          Where do snails live?</p> <p>To use secondary sources to name plants seen in the local environment.</p>		<p>environmental issues and their impact on living things.</p>	<p>questions about the life cycle of a chosen animals and present what they learnt through chosen medium. To research how gardeners asexually reproduce plants.</p>	<p>animals. Research how micro-organisms can be helpful and harmful. Research unusual animals e.g. axolotl, platypus, kangaroos etc.</p>
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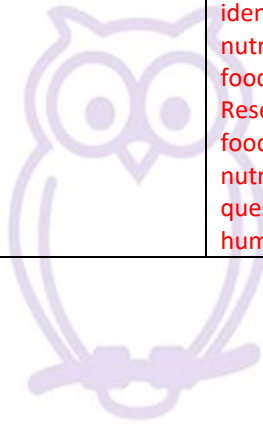
## Animals including humans

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils will name common animals.</p> <p>Pupils will name basic parts of the human body.</p> <p>Pupils will notice changes in their bodies after exercise such as heart beating faster.</p> <p>Pupils understand the importance of hand washing.</p>	<p>Pupils will identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</p> <p>Pupils will identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds, and mammals, including pets)</p> <p>Pupils will 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>Pupils notice that animals, including humans have offspring which grow into adults.</p> <p>Pupils find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Pupils describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>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.</p> <p>Identify that humans and some other animals have skeletons and muscles for support, protection, and movement.</p> <p>Through classifying animals, pupils will learn of vertebrates, invertebrates, endoskeleton, exoskeleton and hydro skeleton.</p> <p>Name and label bones using scientific names.</p> <p>Pupils will identify ball and socket, hinge and gliding joints.</p> <p>Pupils will learn what</p>	<p>Pupils will know the basic parts of the digestive system in humans.</p> <p>Pupils will know and can identify the different types of teeth in humans and their simple functions.</p> <p>Pupils know which organisms are producers, predators and prey. They can apply to the construction and interpretation of food chains.</p>	<p>Pupils will know the timeline of stages in growth and development of humans.</p> <p>Pupils will know about the changes experienced in puberty.</p> <p>Pupils will know the gestation periods of other animals and comparing them with humans.</p>	<p>Pupils will know and be able to identify and label the main parts of the human circulatory system.</p> <p>Pupils will know the functions of the heart, blood vessels and blood.</p> <p>Pupils will know and recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</p> <p>Pupils will know ways in which nutrients and water are transported within animals, including humans.</p>



			muscles are and how they move voluntarily and involuntarily.			
Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Eyes, ear, nose, mouth, body, head, hands, legs, arms, feet , animals ,beak, paws, hooves, heart, tail, wing, feathers, scales fish, bird, snake crocodile etc	Sight senses head body eyes ears mouth teeth leg tail wing claws fin scales feathers hearing smell taste amphibians bird fish mammals' reptile's carnivore herbivore omnivore	Adults young offspring lifecycle develop dependent reproduce dehydrates diet nutrition disease energy germs pulse heart rate survival	Vertebrate invertebrate endoskeleton exoskeleton hydro skeleton muscles tendons joint vertebrate column spine skull humerus, patella tibia ulna radius pelvis clavicle saturated and unsaturated fats energy nutrition carbohydrates protein fibre fats vitamins minerals	Digest oesophagus stomach intestines rectum salivary glands pancreas anus gall bladder duodenum organ digestive system premolars molars incisor canine herbivore omnivore carnivore cavity gum disease	Puberty prenatal foetus gestation fertilisation pregnancy infancy childhood adult adolescence asexual sexual lifecycle larynx breasts pubic hair testicles penis menstruate scrotum life expectancy	Circulatory system heart blood vessels arteries drugs oxygenated deoxygenated drug alcohol nutrients plasma cells capillaries
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To classify based on pupil's own criteria, such as physical appearance. Comparative and fair testing- can I taste the difference sweet and sour?	To classify based on pupil's own criteria, such as physical appearance and what they eat. To observe over time animals in the local environment. To seek patterns through asking questions such as 'do people with longer arms have longer legs?' Comparative and fair testing- can I taste the	To classify based on children's own criteria for food items and classifying animals. To observe over time a life cycle e.g. caterpillars, chicks, farm animals) Observe over time how human body changes during/after exercise." To research adult animals and their young e.g. googling	Classify based on children's own Criteria, food items leading to sorting by nutrients. Classify based on children's own criteria animals and their skeleton types. Observing over time, do bones need calcium? Seek patterns through pupil's investigative questions such as Do healthy drinks have less	To compare different types of teeth (linking to simple functions). To classify jaw bones/teeth to aid making food chains e.g. Recognise what eats plants and what eats animals by looking at their teeth. To research the different parts of the digestive system. Pupils to	Research and develop questions to ask an expert e.g. a health visitor, doctor, or nurse.	Observe over time pulse rates before, during and after exercise. To seek patterns where children generate questions such as Do older people have lower pulse rate. Do boys have higher pulse rates? To set up a comparative /fair test to complete different activities to compare the impact on their own

	<p>difference between different flavoured crisps/ skittles/ smarties?</p> <p>To research animals in their local area to name and what they might eat.</p>	<p>pictures and names of animal babies – swan and cygnet.</p>	<p>sugar?</p> <p>Do people with long arms throw further?</p> <p>Can people with short legs jump further?</p> <p>Can people with long legs jump higher?</p> <p>Can people with bigger hands catch the ball more easily?</p> <p>Research by looking at food packaging to identify the amount of nutrients in different food items.</p> <p>Research which types of food contain which nutrients. Generate questions about the human skeleton.</p>	<p>present what they've learnt in different ways: creating a model, write a song, write a story, create a PPT or Sway.</p> <p>To research what different animals eat within a specific environment e.g, coral polar, African grasslands, in order to construct food chains.</p>		<p>heart rate.</p> <p>To generate questions to research about the human circulatory system, children to present findings.</p>
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## Evolution and Inheritance

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						<p>Know and recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.</p> <p>Know how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						<p>Offspring, inheritance, genetics, genes, variation adaptations characteristics habitat environment evolution natural selection fossil adaptive traits.</p>
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						<p>To classify a species of animals e.g. cats, dogs</p> <p>To classify a species of plants e.g. daffodils, tulips, lilies.</p> <p>To seek patterns using different pieces of equipment, e.g. chopsticks, toothpicks, cutlery, to look for patterns linking suitability of bird beaks for available foods i.e. rice, grapes, raisins.</p> <p>Research different types of species and their characteristics making them suitable for different habitats e.g. penguins.</p>

# Chemistry

## Everyday Materials

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils will be able to know and name a few common materials. Pupils will be able to describe how these materials feel.</p>	<p>Pupils will know how to distinguish between an object and the material from which it is made. Pupils will know how to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Pupils will know how to describe the simple physical properties of a variety of everyday materials.</p> <p>Pupils will know how to compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>	<p>Pupils can identify and sort different materials according to their physical properties and discuss the differences and similarities. Pupils can name materials and their properties. Pupils can sort different materials and their properties. Pupils can compare and group the variety of materials.</p>	<p>Pupils will be able to compare and group different kinds of rocks on the basis of their appearance and simple physical properties. Pupils will describe in simple terms how fossils are formed when things that have lived under trapped within rocks. Pupils will recognise rocks are made from organic and rocks.</p>	<p>Pupils will know how to distinguish and group between solid, liquid and gas. Pupils will know that some materials change when they are heated or cooled. Pupils will know the temperatures at which ice, water and water vapour change state. Pupils will know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>Pupils will know how to 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. Pupils will know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Pupils will know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p>	<p>Pupils will know how to recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p><b>(Evolution and inheritance)</b></p>


					<p>Pupils will know how to use knowledge of solids, liquids and gasses to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Pupils will know that dissolving, mixing and changes of states are reversible changes.</p>	
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### Vocabulary

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Material, soft, hard, bumpy, rough, smooth shiny	Object material hard soft stretchy shiny dull rough plastic metal fabric glass water brick transparent absorbent waterproof stone	Properties suitability material transparent opaque waterproof flexible absorbent squash bendy twisting stretchy	Igneous sedimentary metamorphic magma lava sediment permeable impermeable natural manmade rock cycle limestone obsidian marble granite slate sandstone brick fossils fossilisation palaeontology erosion	Matter solid liquids gases water vapour boiling freezing melting particles precipitation condense evaporate	Solid liquids gas dissolving filtering sieving melting freezing condensing evaporating particles conductivity transparency insulator reversible irreversible	

### Enquiry

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
To classify objects made from the same material/ different materials. To set up comparative/fair test -	To classify objects made from the same material (e.g. lots of things made from plastic). To classify one object	Classifying and sorting materials by their properties i.e. man-made, natural- Classifying which	To classify rocks based on their own criteria such as appearance (at the beginning) leading to physical	To classify based on children's own criteria, classify solids, and classify liquids. Observe over time how	To classify based on children's own criteria classify the materials themselves classify after observing	

<p>Test objects made of different materials to see how effective they are e.g. for Three Little Pigs house.</p>	<p>made from different materials (e.g. cups made of different materials).          To classify different fabrics based on texture (e.g. to make a feely-book for a child).          To classify paper/plastics/fabrics</p> <p>Set up comparative/fair test          Test objects made of different materials to see how effective they are e.g. umbrellas/hats/coats for waterproofness, cloths/nappies for absorbency, socks for elasticity, bounciness of balls, sunglasses for protection from the sun, picnic plates for stiffness, door mats for wiping your feet, different papers for writing on/painting etc.</p>	<p>materials are opaque, transparent          bendy and rough etc          To set up a comparative test for which materials are most suitable i.e. Mending a bucket used in GFOL, Paddington's Raincoat, Which paper would be most useful for a journal?</p> 	<p>properties. To classify different soils and how they are similar and different.          Observe over time how soils separate into different layers in water.          To set up a comparative /fair test to find out which is the hardest rock?          To set up a comparative/fair test to find out which is the most permeable rock?          To set up a comparative/fair test to find out which soils let water run quickly through it.          To use secondary sources to find how fossils are formed.          To use secondary sources to find out about the rock cycle</p>	<p>ice melts, watch handprints dry e.g. water handprints on coloured paper towel and watch frozen liquids melt.          To set up a comparative /fair test to measure what affects the melting rate of chocolate (size of pieces, temperature of water, pole' melts?          What affects the rate of evaporation? Test the runniness of liquids.          To research, the melting point of metals and research the water cycle and share their learning through a chosen medium.</p>	<p>what happens when solids are added to liquids, classify materials based on the outcomes.          Observe over time rusting with uncoated nails in different liquids.          To set up a comparative /fair test to measure which material would be good for a tent?          Which material would be good to make a tea bag from?          Which material would be good for a bag for different purposes?          To test solids for solubility, compare rates of solubility and burn different materials.</p>	
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# Physics

## Seasonal Changes

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils will observe the changes across the four seasons.</p> <p>Pupils will describe suitable clothing for each season.</p>	<p>Pupils will observe and know the changes across the four seasons.</p> <p>Pupils will observe and describe weather associated with the seasons and how day length varies.</p>		<p>Know that light is needed to see things and that dark is the absence of light.</p> <p>Pupils will know that light is reflected from surfaces</p> <p>Know that light from the sun can be dangerous and that there are ways to protect the eyes.</p> <p>Know that shadow are formed when the light from a light source is blocked by an opaque object.</p> <p>Know and can explain some of the reasons why the size of shadows changes.</p> <p>Pupils know the shadows of transparent, opaque and translucent materials vary.</p> <p>(Light)</p>		<p>Pupils will know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>(forces)</p> <p>Pupils will describe the movement of the Earth and other planets, relative to the sun in the solar system.</p> <p>Pupils will describe the movement of the moon relative to the Earth.</p> <p>Pupils will use the Earth rotation to explain day and night due to the apparent movement of the sun across the sky.</p> <p>(Earth and Space)</p>	<p>Pupils will know and use the idea that light travels in straight lines to explain why shadows have the same shape as the object that casts them.</p> <p>(Light)</p>

Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Autumn winter summer spring seasons weather month September October November December January February March Snow, wind, rain, sun, day, night, stormy, cloudy, hot , cold, foggy	Autumn winter summer spring seasons daylight weather month hours September October November December January February March April May June July August		Light dark light source reflection ray reflective pupil retina shadow ,absence of light, transparent, translucent , opaque, shiny, matt, surface, mirror, sunlight,		(See Earth and Space) (See forces)	(See Light)
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Record/Photograph what children are wearing (jumper, coat, hats, scarves, etc.) Pattern seeking- look at what is the same and what is different in each season.	Record/Photograph what children are wearing (jumper, coat, hats, scarves, etc.) Make observations of daylight hours e.g. send a diary and toy bear home with one child each day and ask the child to record their activities, but the bear needs to go to bed when it gets dark and the children must record the time this happens. (This gathers evidence, over time, that day length changes and so do activities.) At the end of the year, look for patterns in evidence e.g. Does it					



	rain more in spring? Do we have more sunny days in the summer? Which was the coldest month?					
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## Forces

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Moving and handling:</b> Introduce and encourage pupils to use vocabulary of manipulative e.g. squeeze, prod</p> <p><b>Technology:</b> Pupils will show an interest in technological toys, knobs or pulley, or real objects such as cameras or mobile phones.</p>	<p>Pupils will know and describe the simple physical properties of a variety of everyday materials. Pupils will know how to compare and group together a variety of everyday materials or the physical properties. <span style="color: red;">(Materials)</span></p>	<p>Pupils will know how to identify and compare suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Pupils will know how shapes of solid objects are made from some materials which can be changed by squishing, bending, twisting and stretching. <span style="color: red;">(Materials)</span></p>	<p>Pupils will know that friction affects the way that things move on different surfaces. Pupils will know that some forces need contact between two objects, but magnetic forces can act at a distance. Pupils will know that magnets attract or repel each other and attract some materials and not others. Pupils will know and can describe magnets as having two poles. Pupils will know whether two magnets will attract or repel each other, depending on which pole are facing.</p>		<p>Pupils will know that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Pupils will know and identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Pupils will know and recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.</p>	
Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<span style="color: red;">(See Materials)</span>	<span style="color: red;">(See Materials)</span>	Force friction surface magnetic magnet push		Forces gravity gravitational pull Isaac	

			and pull poles magnetic field repel attract compass		Newton mass weight friction air resistance buoyancy water resistance streamlined mechanism gear pulley	
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<p>To classify based on children's own criteria, sorting materials leading to metal /nonmetal and magnetic /not magnetic.</p> <p>To classify based on children's own criteria, sorting toys leading to what makes them move push/pull force.</p> <p>To set up a comparative /fair test to find out how objects move on different surfaces and to test the strength of different magnets.</p> <p>To research and find out how magnets are used in everyday day life.</p>		<p>To set up a comparative /fair test to compare friction.</p> <p>To set up a comparative /fair test to compare water resistance.</p> <p>To set up a comparative /fair test to compare fair resistance.</p> <p>To set up a comparative /fair test to compare levers, pulleys and gears.</p>	

# Light

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Pupils will respond to their senses sight, sound and smells in the environment.</p>	<p>Pupils will know how to describe the simple physical properties of a variety of everyday materials</p> <p>Pupils will know how to compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p style="color: red;">(Materials)</p>	<p>Pupils will know how to compare and group the variety of materials for particular uses</p> <p style="color: red;">(Materials)</p>	<p>Pupils will know that light is needed to see things and that dark is the absence of light.</p> <p>Pupils will know that light is reflected from surfaces</p> <p>Pupils will know that light from the sun can be dangerous and that there are ways to protect the eyes.</p> <p>Pupils will know that shadow are formed when the light from a light source is blocked by an opaque object.</p> <p>Pupil will know and can explain some of the reasons why the size of shadows changes.</p> <p>Pupils know the shadows of transparent, opaque and translucent materials vary.</p>	<p>Pupils will know and can give examples of how an environment may change both naturally and due to human impact.</p> <p style="color: red;">(Light)</p>	<p>Pupils will know to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p> <p style="color: red;">(Earth and Space)</p>	<p>Pupils will know that light appears to travel in straight lines.</p> <p>Pupils will know how to 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.</p> <p>Pupils will know and 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</p> <p>Pupils will know how to use the idea that light light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p>
Vocabulary						

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Smell sound sight see look	(See Materials)	(See Materials)	Light dark light source reflection ray reflective pupil retina shadow ,absence of light, transparent, translucent , opaque, shiny, matt, surface, mirror, sunlight,	(See Light)	(See Earth and Space)	Light source reflection refraction periscope incident ray reflected ray law bounces angel degrees protractor visible spectrum prism transparent translucent opaque shadows pupil retina shadow

### Enquiry


EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<p>To classify based on children's own criteria, classify light sources- man made/ natural and classify materials leading to reflective/ non reflective, transparent/translucent and opaque.</p> <p>To set up a comparative /fair test to materials reflectiveness and transparency.</p> <p>To investigate shows in terms of size and shape.</p>			<p>To set up comparative/Fair testing to investigate the shape of shadows and link this to light travelling in straight lines.</p>

## Sound

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<p>Pupils will know how sounds are made, associating some of them with vibrating.</p> <p>Pupils will know how sound travels from a source to our ears.</p> <p>Pupils will know the correlation between pitch and the object.</p> <p>Pupils will know the correlation between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Pupils will know that sounds get fainter as the distance from the sound source increases.</p>		
Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<p>Sound, vibration, source travel, pitch, high, low, volume, faint, quiet, loud, insulation, increase, decrease, fainter</p>		

Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				<p>To classify based on pupil's own criteria, sort musical instruments.</p> <p>To set up a comparative /fair test to measure the volume from different instruments.</p> <p>To set up a comparative/Fair test to measure how volume changes away from a source.</p> <p>To set up a comparative/Fair test to explore pitch e.g. through carousel of activities using milk bottles, straw pipes, rulers, elastic bands and guitars.</p> <p>To research, make and play their own instruments based on what they learned about pitch and volume.</p>		

## Electricity

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p><b>Technology</b> Pupils know how to show skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images.</p>	<p>Pupils describe the simple physical properties of a variety of everyday materials. Pupils will know how to compare and group together a variety of everyday materials on the basis of their simple physical properties. <b>(Materials)</b></p>	<p>Pupils will identify and compare the suitability of a variety of everyday materials including wood, metal plastic glass, brick, rock, paper and cardboard for particular uses. <b>(Materials)</b></p> 		<p>Know and identify name of appliances that require electricity to function. Know the basic parts of a circuit, incl cells, wires, bulbs, switches and buzzers. Know that for an appliance to work within a circuit, it has to be part of a complete loop with a battery. Know that a switch in a circuit is a temporary break in an otherwise 'complete circuit'. Know that all metals conduct electricity, but some, such as aluminium and titanium, are relatively poor conductors. Know the recognised symbols used to represent components of a circuit and uses these to represent a circuit pictorially.</p>	<p>Pupils will know how to 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. <b>(Materials)</b></p>	<p>Pupils will know and associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Pupils will know how to 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. Pupils will know to use recognised symbols when representing a simple circuit in a diagram.</p>



Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	( See Materials)	( See Materials)		Electricity generate renewable non- renewable circuit appliances battery electrons	( See Materials)	Circuit symbol cell battery current amps voltage resistance electrons components series parallel
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
				To classify based on children's own criteria, classify household appliances and or toys (leading to electrical / nonelectrical, batteries/ mains). To test and classify materials into insulators and conductors. To set up a comparative /fair test to materials that are insulators and conductors.		To set up a comparative/ Fair testing to nvestigate effect of adding more bulbs to a circuit. To set up a comparative/ Fair testing to investigate effect of adding more cells to a circuit. To set up a comparative/ Fair testing to investigate effect of adding more buzzers to a circuit. To set up a comparative/ Fair testing to investigate effect of adding more motors to a circuit.

## Earth and Space

Knowledge						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					<p>Pupils will know the sun is a star.</p> <p>It is at the centre of our solar system</p> <p>Know there are 8 planets, which travel around the sun in which are fixed orbits.</p> <p>Pupils will know how to describe the movement of the Earth and other planets relative to the sun in the solar system.</p> <p>Pupils will know and describe the movement of the moon relative to the Earth.</p> <p>Know how to describe the sun, Earth and moon as approximately spherical bodies.</p> <p>Pupils will know to use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</p>	

Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Earth planets Sun Mercury Jupiter Saturn Pluto Uranus Neptune Mars Venus satellite spherical bodies orbit rotate geocentric heliocentric axis astronomer	
Enquiry						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					Observe over time the length of shadow throughout the day. To research and generate questions about Earth and space, present their ideas via any medium.	

