



Year 3/4 Long Term Plan A

	Light	Forces and Magnets	Plants	Plants	Animals, incl humans	Animals, incl humans
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key Vocabulary	Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	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	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)		Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain
Previous Knowledge	Year 1 <ul style="list-style-type: none"> Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Describe the simple physical properties of a variety of everyday materials. (Y1 - Materials) 	Year 2 <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	Year 2 <ul style="list-style-type: none"> 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. 		Year 1 <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). Year 2 <ul style="list-style-type: none"> 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. 	Year 1 <ul style="list-style-type: none"> Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Year 2 <ul style="list-style-type: none"> 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. Year 3 <ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.
NC Objectives	<ul style="list-style-type: none"> Recognise that they need light in order to see things, and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by an opaque object. Find patterns in the way that the size of shadows change. 	<ul style="list-style-type: none"> Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing 	<ul style="list-style-type: none"> Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. 	<ul style="list-style-type: none"> Investigate the way in which water is transported within plants Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	<ul style="list-style-type: none"> Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 	<ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey.
Misconceptions	<ul style="list-style-type: none"> we can still see even where there is an absence of any light our eyes ‘get used to’ the dark the moon and reflective surfaces are light sources a transparent object is a light source shadows contain details of the object, such as facial features on their own shadow shadows result from objects giving off darkness. 	<ul style="list-style-type: none"> the bigger the magnet the stronger it is all metals are magnetic. 	<ul style="list-style-type: none"> plants eat food food comes from the soil via the roots flowers are merely decorative rather than a vital part of the life cycle in reproduction plants only need sunlight to keep them warm roots suck in water which is then sucked up the stem. 		<ul style="list-style-type: none"> certain whole food groups like fats are ‘bad’ for you certain specific foods, like cheese are also ‘bad’ for you diet and fruit drinks are ‘good’ for you snakes are similar to worms, so they must also be invertebrates invertebrates have no form of skeleton. 	<ul style="list-style-type: none"> arrows in a food chains mean ‘eats’ the death of one of the parts of a food chain or web has no, or limited consequences on the rest of the chain there is always plenty of food for wild animals your stomach is where your belly button is food is digested only in the stomach when you have a meal, your food goes down one tube and your drink down another the food you eat becomes “poo” and the drink becomes “wee”.

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Key knowledge to be assessed		<ul style="list-style-type: none">•We see objects because our eyes can sense light.•Dark is the absence of light. We cannot see anything in complete darkness.•Some objects, for example, the sun, light bulbs and candles are sources of light.•Objects are easier to see if there is more light. Some surfaces reflect light.•Objects are easier to see when there is less light if they are reflective.•The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light.•Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light.•The size of the shadow depends on the position of the source, object and surface.	<ul style="list-style-type: none">•A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.•A magnet attracts magnetic material. Iron and nickel and other materials containing these ,e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles.•Magnets have two poles –a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other –repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.•For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees.•Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.	<ul style="list-style-type: none">•Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. •The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal.•The leaves use sunlight and water to produce the plant’s food. Some plants produce flowers which enable the plant to reproduce.•Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination).•This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways.•Different plants require different conditions for germination and growth.		<ul style="list-style-type: none">•Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.•Food contains a range of different nutrients –carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water–and fibre that are needed by the body to stay healthy.•A piece of food will often provide a range of nutrients.•Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.	<ul style="list-style-type: none">•Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added. The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.•Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).	
		Resources	Torches Batteries Mirrors	Magnets Magnetic and non-magnetic objects Toy cars Ramps	Flower and vegetable seeds Propagators Soil Garden gloves Trowels Markers Containers to collect and store seeds iPads with PI@ntnet app	Flower and vegetable seeds Propagators Soil Garden gloves Trowels Markers Containers to collect and store seeds Microbits	Food tins	Materials for making your own ‘poo’
What does this look like at Bramhope?		Activities	<ul style="list-style-type: none">• Explore how different objects are more or less visible in different levels of lighting – children to use a lightbox to create different levels of light and the impact of this on being able to see a set of objects in the lightbox.•Explore how objects with different surfaces ,e.g. shiny vs matt are more or less visible.•Explore how shadows vary as the distance between a light source and an object or surface is changed.•Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground.• Explore changes in shadows on the playground at different times of the day. Can they start to see a pattern across the day?	<ul style="list-style-type: none">•Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. Children to then investigate suitable materials for playing skittles game using a ramp.• Investigate the effect of different forces with PE equipment in the playground e.g. throwing a ball, hitting a tennis ball etc.•Explore what materials are attracted to a magnet.•Classify materials according to whether they are magnetic.•Explore the way that magnets behave in relation to each other.•Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table.•Devise an investigation to test the strength of magnets.	<ul style="list-style-type: none">• Visit the garden throughout the topic and different times of the year to observe lifecycle of plants, plant from seed and collect seeds at the end of a plant’s cycle. Plant diary to make observations half termly.• Identify different parts of different plants in the garden - go on a plant scavenger hunt and collect parts from different plants. Use identification charts to identify plants in garden.• Use natural materials to show the different parts of a flowering plant and add notes to explain function of different parts.•Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. Utilise school garden and plant in different conditions outdoors.•Observe the effect of putting cut white carnations or celery in coloured water.	<ul style="list-style-type: none">• Using conclusions made from investigating good planting conditions, sow seeds in garden vegetable patch to grow.• Observe plants in the garden (lavender/wildflowers) being visited by pollinators to understand pollination process.• Research lifecycle of a seed.• Collect seeds on a seed hunt and group seeds based on appearance and then research different types of seed dispersal. Collected seeds to then be planted next season.• Classify seeds in a range of ways, including by how they are dispersed.	<ul style="list-style-type: none">•Classify food in a range of ways.•Use food labels to explore the nutritional content of a range of food items.•Use secondary sources to find out the types of food that contain the different nutrients.•Plan a daily diet to contain a good balance of nutrients.•Explore the nutrients contained in fast food. Collect and recycle fast food containers to explore nutrients.•Use secondary sources to research the parts and functions of the skeleton.•Compare, contrast and classify skeletons of different animals.	<ul style="list-style-type: none">•Research the function of the parts of the digestive system. Label life size human body outlines with key parts.•Make your own ‘poo’ activity which demonstrates how the digestive system works.•Explore eating different types of food to identify which teeth are being used for cutting, tearing and grinding (chewing).• Investigate the effect of different drinks on tooth decay using hard boiled eggs.•Classify animals as herbivores, carnivores or omnivores according to the type of teeth they have in their skulls.•Use food chains to identify producers, predators and prey within a habitat.•Use secondary sources to identify animals in a habitat and find out what they eat.
		Enrichment			Harlow Carr – How plants grow workshop. Sunflower growing competition across classes or at home.	Bramhope in Bloom to support growing in the garden. Community garden day.	STEM ambassadors/parent doctors to deliver talk about skeleton/nutrition/teeth or digestion.	STEM ambassadors/parent doctors to deliver talk about skeleton/nutrition/teeth or digestion.

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	Cross Curricular links/Texts	<p>The Game in the Dark—Herve Tullet</p> <p>The Dark—Lemony Snickett</p> <p>DT – designing shadow puppets and theatre – explore suitable materials for making shadows. Tie in with literacy text.</p>	<p>The Iron Man by Ted Hughes</p> <p>Maths – measuring distance. Recording data.</p>	<p>The Story of Frog Belly Rat Bone by Timothy Basil Ering</p> <p>Bloom—Nicola Skinner</p> <p>The Secret Sky Garden</p> <p>The Great Kapok Tree</p> <p>Under the canopy</p> <p>Computing - Using Pl@ntnet app to identify plants in our wildlife garden</p> <p>Using microbits to monitor soil moisture</p> <p>https://makecode.microbit.org/courses/ucp-science/soil-moisture</p>	<p>A Seed is Sleepy—Dianna Aston & Sylvia Long</p> <p>Seed Safari by Judith Heneghan</p> <p>DT – cooking with vegetables grown (summer term).</p> <p>Computing – use iPads for secondary research.</p> <p>https://www.bbc.co.uk/bitesize/clips/zggyrdm</p>	<p>Professor Astro Cat’s Human Body Odyssey by Dominic Walliman</p> <p>Argh! There’s a skeleton inside you</p> <p>DT – use vegetables from school garden to form part of a nutritious meal. Or// making a sandwich and looking at nutrients.</p> <p>Maths – measuring length of limbs to look for patterns e.g. Do people with long femurs have long ulnas? Recording data.</p> <p>Computing – iPads</p> <p>https://www.mcdonalds.com/gb/en-gb/good-to-know/nutrition-calculator.html</p>	<p>Professor Astro Cat’s Human Body Odyssey by Dominic Walliman</p> <p>The Tooth Book by Dr Seuss</p> <p>The Story of the Little Mole Who Knew it Was None of His Business by Werner Holzwarth</p> <p>Writing – explanation of digestive system.</p>
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Working Scientifically Skills – Taken from PLAN – Progression in working scientifically document

Asking questions and recognising they can be answered in different ways	Making observations and taking measurements	Engaging in practical enquiry to answer questions	Recording and presenting evidence	Answering questions and concluding	Evaluating and raising questions and predictions	Communicating their findings
<p>Asking relevant questions and using different types of scientific enquiries to answer them</p> <ul style="list-style-type: none"> The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. The children answer questions posed by the teacher. Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question. 	<p>Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</p> <ul style="list-style-type: none"> The children make systematic and careful observations. They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements. 	<p>Setting up simple practical enquiries, comparative and fair tests</p> <ul style="list-style-type: none"> The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. <p>Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.</p>	<p>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.</p> <ul style="list-style-type: none"> The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. Children are supported to present the same data in different ways in order to help with answering the question. 	<p>Using straightforward scientific evidence to answer questions or to support their findings</p> <ul style="list-style-type: none"> Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. Identifying differences, similarities or changes related to simple scientific ideas and processes Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions They draw conclusions based on their evidence and current subject knowledge. 	<p>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p> <ul style="list-style-type: none"> They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. 	<p>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p> <ul style="list-style-type: none"> They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

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Outdoor Learning Opportunities - Any activities in **bold** must be taught outdoors.

Year 3		
National Curriculum Statements	Possible Outdoor Activities	Resources
Plants		
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers	<p>Pupils could design flower garden and plant seeds. Later in the year, pupils describe and make careful drawings of the parts of a range of plants that they have planted. Alternatively, make observations of plants already in the wildlife garden.</p> <p>Pupils participate in scavenger hunt and identify the parts of a range of plants in the wildlife garden that they find on the ground e.g. seeds, fruit, leaves. Children to sort/group back in the classroom.</p> <p>Pupils take photographs or collect samples of parts of plants in the playground to sort and group.</p>	Clipboards iPads Seeds, gardening gloves, trowels, labels School garden calendar
Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	<p>Pupils observe how the plants in the playground or local environment change through the year (half termly), looking for buds, flowers, seeds and berries. Use iPads to take photos and then annotate photos with observations.</p> <p>Pupils record the changes that take place through the year to plants in the playground or local environment. Use identification charts to help identify different plants that they are observing.</p> <p>Conduct scavenger seed hunts throughout the year to facilitate discussions about different types of seeds and seed dispersal.</p>	iPads Identification charts relevant to school grounds. Magnifying glasses
Light		
<p>Recognise that shadows are formed when the light from a light source is blocked by an opaque object.</p> <p>Find patterns in how shadows change shape</p>	<p>Pupils look for shadows in the playground caused by the objects blocking the light from the Sun.</p> <p>Pupils use the Sun as a light source to create shadows with their bodies. Pupils to go out at different times of the day and make the same shape. Partner to draw around their shape at different times of the day and then compare shapes.</p>	
Forces and Magnets		
Compare how things move on different surfaces.	<p>Pupils explore moving objects across different surfaces in the playground.</p> <p>Pupils could pull each other on sledges (could be made by pupils or plastic sledges) and compare different surfaces. Pupils should be able to feel the difference in friction between different surfaces.</p>	Plastic sledges

Year 4		
National Curriculum Statements	Possible Outdoor Activities	Resources
Animals including humans		
Construct and interpret a variety of food chains, identifying producers, predators and prey.	Pupils identify the producers, predators and prey in the micro-habitats in the wildlife garden/field.	