Science curriculum progression document 2025 - 2026

Table of Contents

Rocks - Year 3

Statutory NC objectives

•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 when things that have lived are trapped within rock.
• Recognise that soils are made from rocks and organic matter.

Small steps

• **Step 1 - Name 3 rock types and recite basic steps of the rock cycle.**
S -Asking and answering questions
S-To identify and classify

• **Step 2 - Identify the properties of rock**
Enquiry - Look at different rock samples and their features - size, texture, testing permeability - classify based on these
S-To identify and classify
S-To engage in practicals
S-To make observations

• **Step 3 - Explain erosion and list the causes**
S -Asking and answering questions

• **Step 4 - Explain how fossils are formed**
Enquiry - Look at the process of fossil formation
S -Asking and answering questions
S-To make observations

• **Step 5 - Explain why some rocks are more permeable**
Enquiry - Testing soils through water for permeability
S-To make predictions
S-To use equipment and make measurements
S-To engage in practicals
S-To report and record findings
S-To draw conclusions

Key vocabulary

Tier 1
rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, soil, fossil, chalk, soil, sandy/chalk/clay soil

Tier 2

absorb water, marble, sandstone

Tier 3

Slate, granite, peat

Common misconceptions

• rocks are all hard in nature
• rock-like, man-made substances such as concrete or brick are rocks
• materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural'
• certain found artefacts, like old bits of pottery or coins, are fossils
• a fossil is an actual piece of the extinct animal or plant
• soil and compost are the same thing.

Endpoints

By the end of the topic, our children should be able to:
- understand that there are different types of rock which fall under three main types.
- notice that rocks can be eroded and give example of where this has happened and the dangers this can pose.
- have experience of handling different rock types and observing differences in texture, colour, weight and talk about similarities and differences.
- understand what fossils are, what they look like and how they are formed.
- recognise the components of soils that there are different types of soil which drain water differently.
- recognise a link between soils and rocks and the importance that they have in the structure of Earth.

Materials - Year 1

<table>
<tr>
<td><u>Statutory NC objectives</u>
• 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.</td>
<td><u>Small steps</u>
• Step 1 - Match materials and what they are made from.
S-To make observations
S-To identify and classify

• Step 2 - Identify different everyday materials around school.
S-To identify and classify
S-To engage in practicals

• Step 3 - Identify properties of materials.
Enquiry - sort objects based on these properties
S-To make observations
S-To identify and classify
S -Asking and answering questions

• Step 4 - Test materials for waterproof properties.
Enquiry - comparative/fair testing different materials to make an umbrella.
S-To make predictions
S-To use equipment and make measurements
S-To engage in practicals
S-To report and record findings
S-To draw conclusions</td>
<td rowspan="2"><u>Key vocabulary</u>
<u>Tier 1</u>
Object, wood, plastic, glass, metal, water, rock, brick, paper, fabric, foil, card/cardboard, rubber, wool, hard, soft, stretchy, stiff, bendy, floppy, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through

<u>Tier 2</u>

Material, fabric, elastic, clay

<u>Tier 3</u>

waterproof, absorbent</td>
</tr>
<tr>
<td><u>Common misconceptions</u>
• only fabrics are materials
• only building materials are materials
• only writing materials are materials
• the word ‘rock’ describes an object rather than a material
• ‘solid’ is another word for hard.</td>
<td><u>Endpoints</u>
By the end of the topic, our children should be able to:
- name some common materials showing they understand materials are all different.
- give some reasons why not all objects are made from the same materials.
- know the difference between ‘solid’ and ‘hard’
- give some properties of materials</td>
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Materials - Year 2

<table>
<tr>
<td><u>Statutory NC objectives</u>
• 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.</td>
<td><u>Small steps</u>
• Step 1 - Revisit concept of materials and name their properties.
S -Asking and answering questions
S-To identify and classify

• Step 2 - Investigate material use in the local environment and create a tally and block chart. Sort or compare based on properties and possible uses.
S-To identify and classify
S-To report and record findings
To analyse data and raise further questions

• Step 3 - Investigate how materials can change under force
S-To make predictions
S-To use equipment and make measurements
S-To engage in practicals
S-To report and record findings
S-To draw conclusions

• Step 4 - Consider how absorbent materials are.
Enquiry - Investigate different materials to test if they are absorbent
S-To make predictions
S-To use equipment and make measurements
S-To engage in practicals
S-To report and record findings
S-To draw conclusions
To analyse data and raise further questions</td>
<td rowspan="2"><u>Key vocabulary</u>
<u>Tier 1</u>
Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard Properties of materials – as for Year 1 push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching

<u>Tier 2</u>

flexible

<u>Tier 3</u>

opaque, transparent and translucent, reflective, nonreflective, rigid/rigid shape</td>
</tr>
<tr>
<td><u>Common misconceptions</u>
• only fabrics are materials
• only building materials are materials
• only writing materials are materials
• the word rock describes an object rather than a material
• solid is another word for hard.</td>
<td><u>Endpoints</u>
By the end of the topic, our children should be able to:
- name some common materials and explain how they are different.
- recognise common materials that are used in the local environment.
- explain how different materials might be used for different purposes.
- explain or demonstrate how materials can be changed under force.
- Explain that some materials are absorbent (naming some that are)</td>
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Materials - Year 4

Statutory NC objectives

• Compare and group materials together, according to whether they are solids, liquids or gases.
• 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).
• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Small steps

• **Step 1 - Explore particle movement and how this changes the properties of the state of matter.**
Enquiry - classifying matter into solids, liquids and gases based on their properties
S -Asking and answering questions
S-To identify and classify

• **Step 2 - Investigate how evaporation changes based on heat.**
Enquiry - into evaporation in different conditions.
S -Asking and answering questions
S-To make predictions
S-To use equipment and make measurements
S-To engage in practicals
S-To report and record findings
S-To draw conclusions
To analyse data and raise further questions

• **Step 3 - Observe how quickly ice melts**
Enquiry - how does ice melt over time
S-To make observations
S -Asking and answering questions
S-To engage in practicals
S-To report and record findings

• **Step 4 - Name and describe steps of the water cycle**
S -Asking and answering questions
S-To identify and classify

Key vocabulary

Tier 1
melting, freezing, evaporation, temperature, water cycle

Tier 2

melting point, boiling point, Solid, liquid, gas, state change,

Tier 3

Solid, liquid, gas (particle model useful for these) state change,

Common misconceptions

• 'solid' is another word for hard or opaque
• solids are hard and cannot break or change shape easily /are often in one piece
• substances made of very small particles like sugar or sand cannot be solids
• particles in liquids are further apart than in solids and they take up more space
• when air is pumped into balloons, they become lighter
• water in different forms – steam, water, ice – are all different substances

Endpoints

By the end of the topic, our children should be able to:
- explain key differences between particle models for solids, liquids and gases.
- give some examples of solids, liquids and gases.
- explain the effect of heating and cooling on certain materials. (freezing, thawing, melting, evaporating, etc)
- explain the key steps in the water cycle.

• all liquids boil at the same temperature as water (100 degrees) • melting, as a change of state, is the same as dissolving • steam is visible water vapour (only the condensing water droplets can be seen) • clouds are made of water vapour or steam • the substance on windows etc. is condensation rather than water • the changing states of water (illustrated by the water cycle) are irreversible • evaporating or boiling water makes it vanish • evaporation is when the Sun sucks up the water, or when water is absorbed into a surface/material.		

Materials - Year 5

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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. • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	• **Step 1 - Identify how materials are suited to jobs based on hardness, transparency, electrical and thermal conductivity and attraction to magnets.** S -Asking and answering questions S-To identify and classify • **Step 2 - Compare and group together everyday materials on the basis of their thermal conductivity by investigating thermal conductors and insulators. Give particular uses for materials based on thermal conductivity.** Enquiry - comparing and grouping materials based on thermal conductivity S -Asking and answering questions S-To identify and classify S-To make observations S-To engage in practicals • **Step 3 - Learn about solubility, the rate at which it occurs and how well different everyday materials dissolve.** Enquiry - Investigate rates of dissolving by carrying out comparative and fair test S-To engage in practicals S-To use equipment and make measurements S -Asking and answering questions S-To report and record findings S-To draw conclusions	Tier 1 mixture, sieve, burning, rusting, new material Tier 2 change of state, filter, reversible/non-reversible change Tier 3 Thermal/electrical insulator/conductor, dissolve, solution, soluble, insoluble,

	• **Step 4 - Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.** S-To engage in practicals S-To use equipment and make measurements S -Asking and answering questions S-To report and record findings S-To draw conclusions To analyse data and raise further questions • **Step 5 - Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.** S -Asking and answering questions S-To make observations S-To identify and classify • **Step 6 - Research new materials made by scientists.** Enquiry - Research into new materials S -Asking and answering questions S-To identify and classify	
Common misconceptions • Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed. • thermal insulators keep cold in or out • thermal insulators warm things up • solids dissolved in liquids have vanished and so you cannot get them back • lit candles only melt, which is a reversible change.	**Endpoints** By the end of the topic, our children should be able to: - name and sort materials based on their properties and how they are then suited to particular jobs or uses. - identify some common thermal conductors and thermal insulators. - explain the terms 'soluble' and 'dissolve' - give some examples of reversible and non-reversible changes, explaining why they are reversible or non-reversible.	

Animals Including Humans - Year 1

<table>
<tr>
<td><u>Statutory NC objectives</u>
•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.</td>
<td><u>Small steps</u>
• Step 1 - Name animals as one of 5 vertebrate groups.
Enquiry - Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
S-To identify and classify

• Step 2 - Compare the main differences between different groups of animals e.g. which have features, which have fins.
S -Asking and answering questions
S-To make observations
S-To identify and classify

• Step 3 - Understand the terms omnivore, carnivore and herbivore and name some animals based on learning about what they eat.
S -Asking and answering questions
S-To identify and classify

• Step 4 - Create a body map to show an understanding that there are 5 senses and explore their own senses.
S -Asking and answering questions
S-To identify and classify</td>
<td rowspan="2"><u>Key vocabulary</u>
<u>Tier 1</u>
Head, body, eyes, ears, mouth, teeth, leg, tail, wing
Parts of the body including those linked to PSHE teaching
Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue

<u>Tier 2</u>
claw, feathers, fur, beak, paws, hooves
Names of animals experienced first-hand from each vertebrate group</td>
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<td><u>Common misconceptions</u>
Some children may think:
• only four-legged mammals, such as pets, are animals
• humans are not animals
• insects are not animals
• all 'bugs' or 'creepy crawlies', such as spiders, are part of the insect group</td>
<td><u>Endpoints</u>
By the end of the topic, our children should:
- Recognise a variety of common animals from their habitat and some other habitats around the country/world.
- Realise that animals eat different things (plants, meat or both) to survive and give some examples
- Understand how our 5 senses help us, where they are located on our body and explain how each of them is useful to us.</td>
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Animals Including Humans - Year 2

Statutory NC objectives	Small steps	Key vocabulary
•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.	**• Step 1 - Explore differences and similarities between pictures of animals and their offspring.** S -Asking and answering questions S-To make observations S-To identify and classify **• Step 2 - Explore the life cycle of a frog** S -Asking and answering questions **• Step 3 - Explore how humans change as they grow.** Enquiry - Do older children always wear bigger shoes? S -Asking and answering questions S-To make observations S-To report and record findings **• Step 4 - Find out about what pets/animals need to survive.** Enquiry - Ask pet owners questions S -Asking and answering questions S-To make predictions S-To report and record findings **• Step 5 - Explore hygiene and ways in which to be hygienic.** Enquiry - what is the best way to wash our hands (water, water and soap, warm water and soap) S-To make observations S-To engage in practicals S-To report and record findings **• Step 6 - Discuss how to stay healthy and focus on the EatWell plate.** Enquiry - Classify food into different food groups S-To identify and classify S -Asking and answering questions **• Explore whether there is a link between heart rate and exercise and discuss why this is good for us.** Enquiry - Investigate heart rate when completing different exercises S-To make predictions S-To use equipment and make measurements S-To engage in practicals S-To report and record findings S-To draw conclusions	Tier 1 growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, breathing, food types (examples – meat, fish, vegetables, bread, rice, pasta) Tier 2 germs, disease Tier 3 Offspring, reproduction, hygiene

	To analyse data and raise further questions	
Common misconceptions • an animal's habitat is like its 'home' • all animals that live in the sea are fish • respiration is breathing • breathing is respiration.	**Endpoints** By the end of the topic, our children should be able to: - that animals and humans grow and recognise changes in their size and appearance. - know that exercise increases our heart rate and that helps to keep our heart healthy. - that animals require food in order to grow and how different foods help us to do this. - what hygiene is, how we can be hygienic (washing hands, brushing teeth) and what happens if we aren't.	

Animals Including Humans - Year 3

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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.	• **Step 1 - Learn about nutrients and the ways in which they keep us healthy and explore food groups.** S -Asking and answering questions S-To identify and classify • **Step 2 - Identify nutrients/contents of different foods and discuss how they would affect our bodies.** Enquiry - Use food packets to look at and identify the nutrients in them and find the value - can children recognise if this is a good food choice. S -Asking and answering questions S-To identify and classify • **Step 3 - Explore the skeletons of different animals and compare them.** Enquiry - Identify the different skeleton (endo, exo and hydro) types of different animals - classify and sort into groups - endo, exo and hydro. S -Asking and answering questions S-To identify and classify • **Step 4 - Find out about the role of bones and their function. Compare size and use of bones in the human body.** S -Asking and answering questions S-To identify and classify • **Step 5 - Find out about the role of muscles and their functions. Compare size and use of muscles in the human body.**	Tier 1 water, skeleton, bones, muscles, protect, move, skull, ribs, spine Tier 2 sugars,vitamins, minerals, fibre, fat, joints, support Tier 3 Nutrition, nutrients, carbohydrates, protein,

	S -Asking and answering questions S-To identify and classify	
Common misconceptions • 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.	**Endpoints** By the end of the topic, our children should be able to: - understand what a nutrient is and that foods have different quantities of nutrients. - understand how food labels can help us identify the positive and negative effects of different quantities on our health. - explain the role of the skeleton and specific bones within the skeleton. - explain the role of the muscles and understand how they work.	

Animals Including Humans - Year 4

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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.	• **Step 1 - Identify the types of teeth that humans have and compare them with the teeth/diet of other animals.** Enquiry - compare, contrast and group the jaw bones and teeth of different animals. S -Asking and answering questions S-To identify and classify • **Step 2 - Using eggs, leave teeth in different liquids to explore effects.** S-To make predictions S-To engage in practicals S-To report and record findings S-To draw conclusions • **Step 3 - Explore the role of the digestive system through hands on practical and understand the role of different organs.** S-To make observations S-To use equipment and make measurements • **Step 4 - Draw food chains based on a habitat which they have visited. Find out about food chains from around the world and construct them using appropriate recording.** Enquiry - Researching what animals in habitats around the world eat. S -Asking and answering questions S-To identify and classify S-To report and record findings	Tier 1 mouth, teeth, saliva, stomach, teeth, food chain Tier 2 Digestive system, digestion, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, Tier 3 Oesophagus, small intestine, nutrients, large intestine, rectum, anus, producer, predator, prey,
Common misconceptions	**Endpoints**	

• 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 • animals are only land-living creatures • animals and plants can adapt to their habitats, however they change • all changes to habitats are negative.	By the end of the topic, our children should be able to: - Recognise the steps of the digestive system and why it's needed. - Understand the role of different types of teeth and recognise how the teeth of different animals varies from our own. Explain the reasons for these differences. - Understand what happens to our teeth if we drink too much sugar and regosnise a suitable amount. - construct food chains and know that food chains form a web therefore, one animal doesn't eat only one other. Recognise that animals don't eat every animal or plant in its habitat.	

Animals Including Humans - Year 5

Statutory NC objectives	**Small steps**	**Key vocabulary**
• Describe the changes as humans develop to old age. Non-statutory • Pupils should draw a timeline to indicate stages in the growth and development of humans. • They should learn about the changes experienced in puberty. • Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.	**Step 1 - Name the stages of a human's life cycle and the impact that different environmental/personal factors can have on this.** S -Asking and answering questions S-To identify and classify • **Step 2 - Understand how babies develop by looking at the first year of their lives.** Enquiry - Use graphs to compare data in age and height S-To draw conclusions To analyse data and raise further questions • **Step 3 - Name some ways in which our minds change as we get older and research ways to help our minds stay healthy.** Enquiry - developing questions as a class to ask an expert S -Asking and answering questions • Step 4 - Puberty. This will cover the menstrual cycle and nocturnal emissions. Pupils will learn how both male and female bodies change as they grow. Pupils will learn the importance of hygiene linked with puberty. S -Asking and answering questions • Step 5 - Puberty. This will cover the emotional change that occurs during puberty. S -Asking and answering questions	Tier 1 Female, male, body, changes, hips, Tier 2 Hygiene, breasts, pubic hair, vagina, penis, testicles, puberty Tier 3 Hormones, menstruation/period/ovulation, egg , ovaries, womb/Uterus, semen, sperm, nocturnal emissions / wet dreams, erection, estrogen, progesterone, Testosterone

Common misconceptions	**Endpoints**	
• a baby grows in a mother's tummy • a baby is "made".	By the end of the topic, our children should be able to: - Recognise changes in the male and female body through childhood, puberty and into adulthood. Also, as we get older, different parts of our bodies change. - Understand that bodies become stronger and then weaker and name ways in which humans can try and stay fit and healthy as they age. - Explain ways in which bodies need to be kept hygienic and the reasons.	

Animals Including Humans - Year 6

Statutory NC objectives	**Small steps**	**Key vocabulary**
• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. • Describe the ways in which nutrients and water are transported within animals, including humans.	• **Step 1 - Learn the organs in the human body and which system they relate to.** S -Asking and answering questions S-To identify and classify • **Step 2 - Explore how the heart works** Enquiry - heart dissection S-To engage in practicals • **Step 3 - Explore how the lungs work.** S -Asking and answering questions • **Step 4 - Identify the components of blood.** Enquiry - Making a 'blood smoothie' to learn about the components of blood and their roles. S -Asking and answering questions S-To identify and classify S-To engage in practicals • **Step 5 - Explore the relationship between exercise and recovery of the heart.** Enquiry - measuring heart rate through a range of activities and the pace at which is slows back to a normal rate. S-To make predictions S-To make observations S-To use equipment and make measurements S-To engage in practicals S-To report and record findings	Tier 1 Human body, organ, liver, kidney, heart, lungs, brain, stomach, intestines, blood, vein, capillary, artery, pump, heart rate, pulse, exercise, energy, heart monitor, diet, exercise, drugs, alcohol, smoking, cancer, clogged arteries, blood clots, health, water Tier 2 gallbladder, pancreas, esophagus, spleen, blood vessel, blood cell, chamber, valve, nutrient, micronutrient, fibre, vitamin, Tier 3 plasma, haemoglobin, oxygenated, deoxygenated,pulmonary artery, atria, aorta, cardiac, myocarditis, transplant, cardiopulmonary resuscitation, defibrillator, bronchi, trachea, bronchiole, diaphragm, alveoli,

	S-To draw conclusions **To analyse data and raise further questions** **• Step 6 - Revisit the importance of health on our bodies and heart but with a focus on alcohol, drugs, smoking, diet.** **S -Asking and answering questions** **S-To identify and classify**	
Common misconceptions • your heart is on the left side of your chest • the heart makes blood • the blood travels in one loop from the heart to the lungs and around the body • when we exercise, our heart beats faster to work the muscles more • some blood in our bodies is blue and some blood is red • we just eat food for energy • all fat is bad for you • all dairy is good for you • protein is good for you, so you can eat as much as you want • foods only contain fat if you can see it • all drugs are bad for you.	**Endpoints** By the end of the topic, our children should be able to: - Understand the basic position of organs in our bodies and identify those taught in Year 4 and those organs associated with the circulatory system. - look at a heart and identify the main features and their functions - know that different substances/factors/routines can affect our bodies in different ways and explain why these are good/bad with reasons. - recognise the role and components of the blood, how it moves round the body and why it needs to do this.	

Evolution - Year 6

Statutory NC objectives	**Small steps**	**Key vocabulary**
Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	• **Step 1 - Explore the concept of variation using Haribo. Compare photos of adult and offspring to understand they look similar but not identical.** S -Asking and answering questions S-To make observations • **Step 2 - Explore variation in terms of inheritance and adaptation.** * Enquiry - explore inheritance of dimples, earlobe attachment and tongue roll in class. S-To make observations S-To report and record findings To analyse data and raise further questions • **Step 3 - Difference between inherited and acquired characteristics. Plotted on bar chart** MATHS LINK (bar chart) S-To report and record findings S-To draw conclusions To analyse data and raise further questions • **Step 4 - Who were the pioneers of evolution?** Enquiry - What impact have Charles Darwin/Mary Anning/Alfred Wallce had on how we think about evolution? S -Asking and answering questions	Tier 1 Animal, parent, environment, fossil, finch, skeleton, purpose, survival, instinct Tier 2 Offspring, cell, inherit, acquire, adapt, variation, evolve, evolution, pioneer, instinct Tier 3 gene, chromosome, DNA

	• **Step 5 - Introducing species adaptation over a long period of time.** Enquiry - how do the shape of birds' beaks help them to survive? Darwin's finches experiment. **S-To make predictions** **S-To make observations** **S-To engage in practicals** **S-To report and record findings** **S-To draw conclusions** • **Step 6 - Do only animals adapt to survive?** Enquiry - how have plants adapted to different climates and biomes? **S -Asking and answering questions** **S-To identify and classify**	
Common misconceptions • adaptation occurs during an animal's lifetime: giraffes' necks stretch during their lifetime to reach higher leaves and animals living in cold environments grow thick fur during their life • offspring most resemble their parents of the same sex, so that sons look like fathers • all characteristics, including those that are due to actions during the parent's life such as dyed hair or footballing skills, can be inherited • cavemen and dinosaurs were alive at the same time.	**Endpoints** By the end of the topic, our children should be able to: - Understand the basic position of organs in our bodies and identify those taught in Year 4 and those organs associated with the circulatory system. - look at a heart and identify the main features and their functions - know that different substances/factors/routines can affect our bodies in different ways and explain why these are good/bad with reasons. - recognise the role and components of the blood, how it moves round the body and why it needs to do this.	

Plants - Year 1

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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.	• **Step 1 - Practically explore a range of plants to identify main parts of structure (naming) through dissection.** S-To make observations S-To engage in practicals S-To identify and classify • **Step 2 - To identify and name evergreen and deciduous trees in the local environment.** S-To identify and classify S -Asking and answering questions • **Step 3 - Name local plants and use a classification key to do this e.g. daisy, tree.** S-To identify and classify S -Asking and answering questions • **Step 4 - Compare leaf size with plant size** Enquiry - Do bigger plants/trees always have bigger leaves? S-To make predictions S -Asking and answering questions • **Step 5 - Revisit plants throughout the year in school groups, using clues to identify plants and trees.** S -Asking and answering questions S-To identify and classify	Tier 1 Leaf, flower, petal, fruit, berry, Names of trees in the local area Names of garden and wild flowering plants in the local area Tier 2 Blossom, root, seed, trunk, branch, stem, bark, stalk, bud Tier 3 Names of trees in the local area Names of garden and wild flowering plants in the local area
Common misconceptions • plants are flowering plants grown in pots with colored petals and leaves and a stem	**Endpoints** By the end of the topic, our children should be able to: - understand what a plant is and be able to identify plants in their local environment	

• trees are not plants • all leaves are green • all stems are green • a trunk is not a stem • blossom is not a flower.	(both in school and at home) - understand the terms of deciduous and evergreen and know the difference between these. They will also have identified these trees during the year and commented on what they have noticed. - Realise that plants and trees come in lots of shapes, sizes and structures and notice some simple similarities and differences between them.	

Plants - Year 2

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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.	**• Step 1 (RETRIEVAL) - Identity the role of each part of a plant. (RETRIEVAL)** S -Asking and answering questions **• Step 2 - Study and explore a selection of seeds and bulbs** S -Asking and answering questions S-To make observations **• Step 3 - Plant cress and make observations after the removal of key element of growth and make observations (soil, light, water)** (Enquiry - How does a plant grow in different conditions?) S-To make predictions S-To engage in practicals S-To report and record findings S-To draw conclusions **• Step 4 - To grow sunflowers and to observe growth and record findings.** (Enquiry - Plant a variety of seeds and bulbs and observe changes as they grow (sunflower) S-To engage in practicals S-To make observations S-To report and record findings **• Step 5 - Nurture plant growth and identify components of successful growth** (Enquiry - Plant seeds/bulbs in CD case and observe growth of roots and stem.) S-To engage in practicals S-To make observations S-To report and record findings **• Step 6 - Identify plants around the world** S -Asking and answering questions	Tier 1 light, shade, sun, warm, cool, water, grow, healthy, leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Tier 2 Names of trees in the local area Names of garden and wild flowering plants in the local area

	S-To identify and classify • **Step 7 (RETRIEVAL) - Explore evergreen and deciduous trees in the local environment.** S -Asking and answering questions S-To identify and classify	
Common misconceptions • 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.	**Endpoints** By the end of the topic, our children should be able to: - Be secure in naming the parts of a plant in different plants *and* it's role in keeping the plant alive - understand that plants grow from seeds and bulbs and what a variety of these look like - have experience of watching some plants grow from seeds/bulbs (sunflower) and be able to talk about the changes that have happened - be able to explain what would happen to a plant if it didn't have water, sunlight or soil and give some simple explanation as to why this is	

Plants - Year 3

Statutory NC objectives • 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.	**Small steps** • **Step 1 - Revisit the parts of a plant. Make links between structure and function.** E.g. leaves being flat, roots being long, stem's stability. S -Asking and answering questions S-To identify and classify • **Step 2 - Investigate what happens when a plant is restricted.** Enquiry - Remove space, root and air with radish plant. Observe effects on the plant. S-To make predictions S-To make observations S-To engage in practicals S-To report and record findings S-To draw conclusions • **Step 3 - Observe water transportation through a plant using coloured dyes.** Enquiry - Celery experiment to explore movement of water through a stem S-To make observations S -Asking and answering questions	**Key vocabulary** Tier 1 light, shade, sun, warm, cool, water, grow, healthy, leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud Tier 2 pollen, insect/wind pollination Tier 3 Photosynthesis, seed

	• **Step 4 - Learn about the life cycle of a plant.** S -Asking and answering questions • **Step 5 - Explore seed dispersal.** Enquiry - groups trees with different seed dispersal S -Asking and answering questions S-To identify and classify	formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)
Common misconceptions • 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.	**Endpoints** By the end of the topic, our children should be able to: - name the parts of a plant and give detail about their role and some simple explanation as to how they help the plant survive. - know that plants need different things depending on their habitat and that plants adapt to their surroundings. - to have observed water traveling through a plant (celery) - name different types of seed dispersal and give details of how they work with some examples. - understand what the pollination cycle is, be able to name the steps and explain why it is important.	

Living Things and their Habitat - Year 2

Statutory NC objectives	**Small steps**	**Key vocabulary**
• 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 microhabitats.	• **Step 1 - Cover MRS GREN and relate to what animals need - this should cover basics but not the detailed scientific explanations.** Enquiry - Classify materials based on these categories S -Asking and answering questions S-To identify and classify • **Step 2 - Exploring habitats and microhabitats in the woods. Revisit throughout the year during each term (Autumn, Spring, Summer).** S-To make observations S -Asking and answering questions • **Step 3 - Identify some animals that live in different habitats around the world and some features that make them suited to their habitat.** Enquiry - Research animals that live in different habitats and how their body is suited to their habitat S -Asking and answering questions	Tier 1 Living, dead, never been alive, food, shelter, move, feed Tier 2 suited, suitable, basic needs, food chain • Names of local habitats e.g. pond, woodland etc. • Names of micro-habitats e.g.

• 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.	S-To identify and classify • **Step 4 - Learn about and reconstruct food chains from the local environment. Compare if any animals/plants are in more than one food chain.** S -Asking and answering questions S-To identify and classify • **Step 5 - Understand dependency and how one break in the food chain can affect other animals.** S -Asking and answering questions • **Step 6 - Visit St Mary's Lighthouse to understand a coastal habitat.** S -Asking and answering questions S-To make observations	under logs, in bushes etc
Common misconceptions • an animal's habitat is like its 'home' • plants and seeds are not alive as they cannot be seen to move • fire is living • arrows in a food chain mean 'eats'.	**Endpoints** By the end of the topic, children should: - be able to identify things that are living, dead and have never been alive. - understand the processes that something carries out in order to be considered 'alive' and have a basic understanding of what they mean. - Name some animals and the habitats in which they live, naming some characteristics which have adapted them to their environment. - give some examples of basic food chains, naming predators, prey, consumers, producers.	

Living Things and their Habitat - Year 4

Statutory NC objectives • Recognise that living things can be grouped in a variety of ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Recognise that environments can change and that this can sometimes pose dangers to living things.	**Small steps** • **Step 1 - Revisit MRS GREN and explore how plants and animals do each of these processes.** S -Asking and answering questions • **Step 2 - Classify animals based on similar features. Discussion around patterns.** S-To identify and classify S -Asking and answering questions • **Step 3 - Learn the 5 groups of vertebrates and their common behavioural and physical characteristics.** S -Asking and answering questions S-To identify and classify	**Key vocabulary** Tier 1 habitat, positive, negative, migrate, hibernate Tier 2 Classification, classification keys, environment, migrate, hibernate Tier 3 human impact

	• **Step 4 - Create classification keys to sort vertebrate groups.** Enquiry - Creating a key for 5 groups of invertebrates based on characteristics they've learnt. S-To identify and classify • **Step 5 - Identify characteristics of invertebrates.** Enquiry - Research the characteristics of insects, spiders and crustaceans - labeled diagrams S -Asking and answering questions • **Step 6 - Visit woods in winter to collect data on plants and animals. Visit woods in summer and using classification key, identify invertebrates that are found.** S -Asking and answering questions S-To make observations • **Step 7 - Focus on birds and patterns within this group.** Enquiry - identify patterns, similarities and differences between wings and flying in different animals S -Asking and answering questions S-To identify and classify	
Common misconceptions • 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 • animals are only land-living creatures • animals and plants can adapt to their habitats, however they change • all changes to habitats are negative.	**Endpoints** By the end of the topic, children should: - Name the 7 life processes and explain what these mean. Understand how these take place in animals and humans. - Identify similarities and differences between ground of vertebrates and use these to create a classification key which successfully sorts each into its own group. - understand concept of invertebrates and name some animals within some groups from the local environment. Know that spiders are not insects. - Identify patterns within groups of animals.	

Living Things and their Habitat - Year 5

<table>
<tr>
<td><u>Statutory NC objectives</u>
Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.

Describe the life process of reproduction in some plants and animals.</td>
<td><u>Small steps</u>
• Step 1 - Draw, name and label the parts of a plant including male and female organs and describe the process of pollination
S -Asking and answering questions

• Step 2 - Explain the difference between sexual and asexual reproduction in plants and the advantages/disadvantages of each.
Enquiry - Take plant cuttings and observe over time (Spider plant)
S -Asking and answering questions
S-To identify and classify
S-To make observations

• Step 3 - Identify gestation periods of animals.
Enquiry - compare animal size with gestation period.
S -Asking and answering questions
S-To identify and classify
• Step 4 - Compare the life cycles of different animals including insects and amphibians..
Enquiry - research life cycle of different
S -Asking and answering questions
S-To identify and classify</td>
<td><u>Key vocabulary</u>
<u>Tier 1</u>
egg

<u>Tier 2</u>
Life cycle, reproduce, live young, runners, bulbs, cuttings

<u>Tier 3</u>
sexual, sperm, fertilises, metamorphosis, asexual, plantlets,</td>
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<tr>
<td><u>Common misconceptions</u>
• all plants start out as seeds
• all plants have flowers
• plants that grow from bulbs do not have seeds
• only birds lay eggs</td>
<td><u>Endpoints</u>
By the end of the topic, children should:
- Identify the reproductive parts of a plant and use these to describe asexual reproduction.
- have experience of watching a plant grow over time and describe growth.
- Understand that animals have different gestation periods and compare their differences, understanding why they are different.
- Describe the life cycle of some different animals and compare the similarities and differences between both.</td>
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Living Things and their Habitat - Year 6

<table>
<tr>
<td><u>Statutory NC objectives</u>
Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.

Give reasons for classifying plants and animals based on specific characteristics.</td>
<td><u>Small steps</u>
• Step 1 - Recapping the classes of vertebrates and invertebrates and introducing echinoderms and annelids
Enquiry - Creating a classification key by choosing dividing questions based on animal classification. MATHS LINK
S -Asking and answering questions
S-To identify and classify

• Step 2 - Understand the scientific names of creatures and the steps to Linnaean classification
S -Asking and answering questions
S-To identify and classify

• Step 3 - Identify viruses, bacteria and funghi and when these can be helpful/harmful.
S -Asking and answering questions
S-To identify and classify

• Step 4 - Learning about what microorganisms need to survive.
Enquiry - designing and completing an experiment testing how mould grows on bread.
S -Asking and answering questions
S-To make predictions
S-To engage in practicals
S-To report and record findings
S-To draw conclusions</td>
<td><u>Key vocabulary</u>
<u>Tier 1</u>
Animal, plant, mammal, bird, fish, reptile, amphibian, insect, characteristic, classification, classification key, system, scientific name, genus, species, Latin, microorganism, mould, bacteria, funghi, virus

<u>Tier 2</u>
crustacean, mollusc, arachnid, species, Latin,

<u>Tier 3</u>
Microorganism, mould, bacteria, funghi, virus, annelid, echinoderm, genus,</td>
</tr>
<tr>
<td><u>Common misconceptions</u>
• all microorganisms are harmful
• mushrooms are plants</td>
<td><u>Endpoints</u>
By the end of the topic, children should:
- expand their knowledge of invertebrates and the groups within this. category.
- create a classification key based on a variety of vertebrates and invertebrates.
- understand where microorganisms fit within the classification of living things.
- have experience of watching bacteria grow and be able to name times when this is helpful/harmful.</td>
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Electricity - Year 4

Statutory NC objectives	**Small steps**	**Key vocabulary**
• Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • 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. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.	• **Step 1 - Identify appliances and where power comes from** Enquiry - sorting appliances into battery and mains power S-To identify and classify • **Step 2 - Build a simple series circuit with wires, battery, bulb, buzzer, motor.** Drawing this with pictures - not yet symbols Enquiry - What are the effects of adding more components to a simple series circuit? S -Asking and answering questions S-To make predictions S-To make observations S-To engage in practicals S-To use equipment and make measurements • **Step 3 - Making given circuits and predicting/testing to find whether they are complete or not.** S-To engage in practicals S-To make predictions S-To report and record findings S-To use equipment and make measurements • **Step 4 - Explore conductors and insulators** Enquiry - investigating different materials to group as conductors or insulators. S -Asking and answering questions S-To make predictions S-To engage in practicals S-To use equipment and make measurements S-To report and record findings S-To draw conclusions • **Step 5 - Explore switch types and make a switch based on one of these designs.** S-To engage in practicals • **Step 6 - Name electrical dangerous within the home and other familiar environments and give ways to avoid these dangers.**	Tier 1 Electricity, plug, electrical circuit, complete circuit, connect/connections, loose connection, bulb, switch, buzzer, motor, metal, non-metal, symbol Tier 2 electrical appliance/device, mains, component, cell, battery, positive, negative, short circuit, crocodile clip, Tier 3 conductor, insulator,

	S -Asking and answering questions	
Common misconceptions Some children may think: • electricity flows to bulbs, not through them • electricity flows out of both ends of a battery • electricity works by simply coming out of one end of a battery into the component.	**Endpoints** By the end of the topic, children should be able to: - understand the terms 'power', 'electricity' and 'energy'. - be able to make a simple series circuit and explain why and how they have joined equipment together. - name a variety of insulators and conductors and recognise metal as the most useful conductor in most household appliances. - recognise uses of switches around the home and explain why this creates a break in the circuit.	

Electricity - Year 6

Statutory NC objectives	**Small steps**	**Key vocabulary**
• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • 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. • Use recognised symbols when representing a simple circuit in a diagram.	• **Step 1 -Understand what electricity is (flow of electrons) and how it works on an atomic level - represent this as a model.** S -Asking and answering questions • **Step 2 - Name the pioneers of electricity.** Enquiry - Research and discuss important individuals who've made a contribution to electrical innovations. Look at AC/DC currents (Tesla vs Edison) and how they differ. S -Asking and answering questions • **Step 3 - Look at scientific symbols for circuits and how to build a simple and parallel circuit alongside accurate scientific diagrams.** S -Asking and answering questions S-To engage in practicals S-To use equipment and make measurements • **Step 4 - Build and alter circuits to ensure they work, identifying faulty components and how to troubleshoot this.** S-To engage in practicals S-To use equipment and make measurements S-To make observations • **Step 5 - Explain how electricity is generated.**	Tier 1 electricity, mains, battery, cell, closed circuit, open circuit, power, voltage, watts, insulator, conductor. Tier 2 Static, current, load component, pioneer, voltage, watts, Tier 3 Electron, proton, neutron, atom, AC (alternating current), DC (direct current),

	Enquiry - Identify the different ways electricity is generated (renewable and non-renewable) and how homes are powered by mains. S -Asking and answering questions • **Step 6 - Use understanding to create a working circuit that powers a model.** Enquiry - Build a physical model that uses a circuit to light up/buzz/move using knowledge of electricity and circuits. DT - Lighthouse project. S-To engage in practicals	
Common misconceptions • larger-sized batteries make bulbs brighter • a complete circuit uses up electricity • components in a circuit that are closer to the battery get more electricity.	**Endpoints** By the end of the topic, children should be able to: - recognise the scientific symbols used in an electrical circuit. - be able to make a circuit (both simple and parallel) and explain the movement of electricity around the circuit with reference to the atoms and flow of electrons. - identify renewable and non-renewable sources of electricity. Be able to explain the relevance of these in terms of climate changes. *NOTE: Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.*	

Earth and Space - Year 5

Statutory NC objectives • Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies.	**Small steps** • **Step 1 - Explore evidence which suggests the earth is spherical/flat and discuss how we know the Sun, Earth and Moon are spherical** S -Asking and answering questions • **Step 2 - Name and describe features of, and order, the planets in our solar system.** Enquiry - research, using chromebooks to create planet fact files Enquiry - Classifying, grouping and sorting planets based on similarities and differences S -Asking and answering questions S-To identify and classify	**Key vocabulary** Tier 1 Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) Tier 2 Spherical, solar system, rotates, star, orbit, planets

• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	• **Step 3 - Explore geocentric vs heliocentric theories and how planets move.** Enquiry - research how theories have changed over time. Newspaper report. S -Asking and answering questions S-To identify and classify • **Step 4 -Make predictions about night and day in different places on Earth and explain why night and day occur at different times in different places on Earth (time zones).** S -Asking and answering questions S-To make predictions • **Step 5 - Use practical models to explain orbit between celestial bodies.** S -Asking and answering questions S-To make observations S-To engage in practicals • **Step 6 - Name phases of the moon and keep a class diary of the moon phases.** S -Asking and answering questions	
Common misconceptions • the Earth is flat • the Sun is a planet • the Sun rotates around the Earth • the Sun moves across the sky during the day • the Sun rises in the morning and sets in the evening • the Moon appears only at night • night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.	**Endpoints** By the end of the topic, children should be able to: - recognise the scientific symbols used in an electrical circuit. - be able to make a circuit (both simple and parallel) and explain the movement of electricity around the circuit with reference to the atoms and flow of electrons. - identify renewable and non-renewable sources of electricity. Be able to explain the relevance of these in terms of climate changes. *NOTE: Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.*	

Forces - Year 3

Statutory NC objectives	Small steps	Key vocabulary
• 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	**• Step 1 - Recognise that forces are push and pull motions. Recognise different push and pulls around the school** S -Asking and answering questions S-To identify and classify **• Step 2 - Recognise the poles of a magnet and when they will attract and repel by using magnets to explore. Make predictions based on this.** S-To make predictions S-To make observations S-To engage in practicals **• Step 3 - Investigate magnetism of materials.** Enquiry - sorting objects into magnetic or not magnetic/both - depending using a magnet to test this. S-To make predictions S-To make observations S-To engage in practicals S-To identify and classify S-To report and record findings **• Step 4 - Make the link between distance and magnetism.** Enquiry - Investigating magnet strength. S-To make predictions S-To make observations S-To engage in practicals S-To report and record findings **• Step 5 - Investigate how surfaces change the way an object moves.** Enquiry - Investigate the movement of an object across different surfaces and measure distance travelled by toy car as friction. MATHS LINK (measuring distance travelled) S-To make predictions S-To engage in practicals S-To report and record findings S-To use equipment and make measurements S-To draw conclusions	Tier 1 push, pull, twist, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, metal, iron, steel, Tier 2 Force, attract, repel, magnetic material, poles, north pole, south pole Tier 3 contact force, non-contact force, magnetic force,

Common misconceptions • the bigger the magnet the stronger it is • all metals are magnetic.	**Endpoints** By the end of the topic, children should: - Notice that some forces need contact between two objects and how this compares between forces and objects. - Notice that magnetic force can work at a distance. - Use the terms repel and attract in relation to magnetism and explain or demonstrate what they mean - Recognise that some objects are attracted by magnets and some are not. - Understand that magnets have two poles and explain how these poles affect whether magnets will repel or attract.	

Forces - Year 5

Statutory NC objectives • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	**Small steps** • **Step 1 - Recap forces and identify them around them** S -Asking and answering questions S-To identify and classify • **Step 2 - Look at the difference between weight and mass and discuss gravity pull and effect on force** Enquiry - Use newton meters to measure force of gravity on objects of different mass MATHS LINK (measuring using Newton metre) S-To use equipment and make measurements S-To engage in practicals S-To report and record findings S-To draw conclusions • **Step 3 - Considering benefits/disadvantages of friction.** Enquiry - Identifying high/low friction and whether is is useful S -Asking and answering questions	**Key vocabulary** Tier 1 Force, Earth, mechanisms, simple, machines, levers, pulleys, gears Tier 2 air resistance, water resistance, friction, gravity, simple, machines, levers, pulleys, gears Tier 3 mechanisms

	• **Step 4 - Designing and testing a rocket that can travel most easily with least air resistance.** S-To engage in practicals S-To report and record findings S-To draw conclusions • **Step 5 - Identify what water resistance is and identify positives and negatives.** Enquiry - Do heavier items have more water resistance? Experiment with different shapes of plasticine to the time taken to travel through water. S-To make predictions S-To use equipment and make measurements S-To engage in practicals S-To report and record findings S-To draw conclusions	
Common misconceptions • the heavier the object the faster it falls, because it has more gravity acting on it • forces always act in pairs which are equal and opposite • smooth surfaces have no friction • objects always travel better on smooth surfaces • a moving object has a force which is pushing it forwards and it stops when the pushing force wears out • a non-moving object has no forces acting on it • heavy objects sink and light objects float.	**Endpoints** By the end of the topic, children should: - Explain clearly how gravity acts on all objects on Earth - Discuss the effects of different forces (friction, air resistance, water resistance) and how they act between moving surfaces. - Recognise and explain different mechanisms that can have an impact on a force, such as pulleys and levers and how these can allow for a smaller or greater effect from the force.	

Seasonal Change - Year 1

<table>
<tr>
<td><u>Statutory NC objectives</u>
• Observe changes across the four seasons.

• Observe and describe weather associated with the seasons and how day length varies</td>
<td><u>Small steps</u>
• Step 1 - Name the four seasons and describe changes.
Enquiry - Observe changes across the four seasons.
Maths link - created charts to show seasonal changes
S -Asking and answering questions
S-To make observations
S-To report and record findings

• Step 2 - Walk through local environment and record appearance of trees and plant etc associated with each season.
S -Asking and answering questions
S-To make observations
• Step 3 - Observe and compare winter and summer weather.
Enquiry - How many days does it rain / is it sunny in winter and summer?
S -Asking and answering questions
S-To make observations
S-To identify and classify

• Step 4 - Group animals based on what they do in the winter.
Are all days in the summer warm?
S-To identify and classify</td>
<td><u>Key vocabulary</u>
<u>Tier 1</u>
Weather (sunny, rainy, windy, snowy etc.)

<u>Tier 2</u>
Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length</td>
</tr>
<tr>
<td><u>Common misconceptions</u>
• it always snows in winter
• it is always sunny in the summer
• there are only flowers in spring and summer
• it rains most in the winter.</td>
<td><u>Endpoints</u>
By the end of their learning, the children should:
- be able to name the 4 seasons have have experienced temperature, light and plants/animals within each season.
- recall some of these observations from each season.
- understand that weather can change and days in a season can be varied but usually follow a pattern.</td>
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Light - Year 3

Statutory NC objectives	Small steps	Key vocabulary
• 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.	**• Step 1 - Look at different light sources (man made and natural)** Enquiry - grouping sources of light and non-sources of light as well as man made or natural. S-To identify and classify **• Step 2 - Observe how light travels in straight lines and reflects from the object to the eye. (Investigate with torches and talc)** S -Asking and answering questions S-To make observations S-To engage in practicals **• Step 3 - Identifying the risks from sunlight and considering safety steps to take.** S -Asking and answering questions **• Step 4 - Identify the dangers of seeing at night and use of reflective materials for signs and clothing.** Enquiry - which material is the most reflective to make a jacket? S -Asking and answering questions S-To identify and classify **• Step 5 - Explore refraction using prisms.** S -Asking and answering questions S-To make observations **• Step 6 - Explore the meanings of opaque translucent and transparent.** Enquiry - testing and sorting objects into opaque and transparent S-To make observations S-To identify and classify S-To engage in practicals **• Step 7 - Find patterns in the shape and size of shadows.** Enquiry - Testing what happens to shadows when the light moves further or closer to an object MATHS LINK (no official measuring but size change when moved closer/further away)	Tier 1 Light, dark, surface, shadow, mirror, sunlight, dangerous Tier 2 light source, absence of light, transparent, translucent, opaque, matt, reflect, Tier 3 light source

	S-To engage in practicals S-To make observations S-To report and record findings	
Common misconceptions • 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.	**Endpoints** By the end of the topic, children should: - understand the difference between light and dark and identify sources of light. - understand that light travels in straight lines. - understand the dangers of light and name ways that they can stay safe. - Recognise that some surfaces can be reflective and explain the importance of these. - Be able to make shadows and independently know how to change the same and size of a shadow.	

Light - Year 6

Statutory NC objectives • Recognise that light appears to travel in straight lines. • 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. • 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. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	**Small steps** • **Step 1 - Explore natural and artificial light, where light comes from, how it travels and the electromagnetic spectrum.** S -Asking and answering questions S-To identify and classify • **Step 2 - Look in detail how light travels from a light source and reflects off objects into the human eye using model. Name and identify parts of the human eye.** S -Asking and answering questions • **Step 3 - Discuss the path of light and whether it can be altered.** Enquiry - Focus on refraction and set up experiments to prove how light travels slower through different mediums. S-To make predictions S-To make observations S-To engage in practicals • **Step 4 - Investigate how periscopes work and the effect mirrors have on light travel.** MATHS LINK (angles) S-To engage in practicals	**Key vocabulary** Tier 1 vision, opaque, transparent, translucent Tier 2 Natural, artificial, light source, rays, iris, pupil, cornea, lens, optic nerve, retina. reflect, refract, spectrum, Tier 3 electromagnetic spectrum, x-ray, gamma ray, infrared, microwave, radio wave,

	• **Step 5 - Shadows** Enquiry - Investigate how shadows are formed and how they change depending on the angle/distance of the light source. MATHS LINK (measuring size and distance) S-To engage in practicals S-To make observations S-To report and record findings S-To use equipment and make measurements S-To draw conclusions	
Common misconceptions • We see objects because light travels from our eyes to the object.	**Endpoints** By the end of the topic, children should: - Understand how light travels and how we therefore see. - be able to change the path of light and explain how they are changing the paths. - explain how shadows change shape with specific reference of their size.	

Sound - Year 4

Statutory NC objectives • Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.	**Small steps** • **Step 1 - Create a model to understand vibrations of molecules in air. (Cling film and salt)** S -Asking and answering questions S-To engage in practicals • **Step 2 - Label parts of the ear and explain how vibrations are converted into sound.** S -Asking and answering questions • **Step 3 - Explore volume** Enquiry - Use a decimeter to measure sounds further to and closer away from an object S-To make predictions S-To use equipment and make measurements S-To engage in practicals S-To report and record findings S-To draw conclusions To analyse data and raise further questions • **Step 4 - Explain differences in volume and pitch when working with different materials. I.e. which are louder, which are higher pitched etc.** S-To use equipment and make measurements	**Key vocabulary** Tier 1 Sound, vibrate, vibration, travel, volume, faint, loud, insulation Tier 2 Source, pitch (high, low), insulation Tier 3

	S-To engage in practicals S-To report and record findings • Step 5 - Consider ways to change volume using soundproofing. Enquiry - Investigating change in volume using different materials and soundproofing. S-To make predictions S-To use equipment and make measurements S-To engage in practicals S-To report and record findings S-To draw conclusions	
Common misconceptions • sound is only heard by the listener • sound only travels in one direction from the source • sound can't travel through solids and liquids • high sounds are loud and low sounds are quiet.	**Endpoints** By the end of the topic, children should: - understand the concept of particles and vibrations - be able to explain how the ear works - using these two models, identify what will make a sound louder/quieter and explain why - Identify different pitches and link these sounds to different vibrations	

Working scientifically - Year 1

Year 1	Working scientifically objectives
Questions	Use everyday language/begin to use simple scientific words to ask or answer a scientific question
Predictions	Begin to say what might happen in an investigation.
Observations	Observe objects, materials and living things and describe what they see.
Measuring	Use simple, nonstandard equipment and measurements in a practical task.
Identify/classify	Sort and group objects, materials and living things, with help, according to simple observational features.
Practicals	Follow instructions to complete a simple test individually or in a group.
Reporting	Begin to record simple data. Talk about their findings and explain what they have found out.

Conclusions	Explain, with help, what they think they have found out.
Analysing	Use every day or simple scientific language to ask and/or answer a question on given data.

Working scientifically - Year 2

Year 2	Working scientifically objectives
Questions	Suggest ideas, ask simple questions and know that they can be answered/investigated in different ways including using simple secondary sources, such as books and video clips.
Predictions	Begin to make predictions.
Observations	Observe something closely and describe changes over time.
Measuring	Use simple equipment, such as hand lenses or egg timers to take measurements, make observations and carry out simple tests. *Shoe size and age link
Identify/classify	Decide, with help, how to group materials, living things and objects, noticing changes over time and beginning to see patterns.

Practicals	Do things in the correct order when performing a simple test and begin to recognise when something is unfair. *What is the best way to wash our hands?
Reporting	Gather data, record and talk about their findings, in a range of ways, using simple scientific vocabulary. Focus: Table (age and shoe size)
Conclusions	Use simple scientific language to explain what they have found out.
Analysing	Identify simple patterns and/or relationships using simple comparative language.

Working scientifically - Year 3

Year 3	Working scientifically objectives
Questions	Use ideas to pose questions, independently, about the world around them.
Predictions	Make predictions and begin to give a reason.
Observations	Make decisions about what to observe during an investigation.
Measuring	Take accurate measurements using standard units.

Identify/classify	Talk about criteria for grouping, sorting and categorising, beginning to see patterns and relationships.
Practicals	Discuss enquiry methods and describe a fair test.
Reporting	Record their findings using scientific language and present in note form, writing frames, diagrams, tables and charts.
Conclusions	Draw, with help, a simple conclusion based on evidence from an enquiry or observation.
Analysing	Gather, record and use data in a variety of ways to answer a simple question.

Working scientifically - Year 4

Year 4	Working scientifically objectives
Questions	Suggest relevant questions and know that they could be answered in a variety of ways, including using secondary sources such as ICT. Answer questions using straight forward scientific evidence.
Predictions	Make predictions and give a reason using simple scientific vocabulary.
Observations	Make systematic and careful observations.

Measuring	Take accurate measurements using standard units and a range of equipment, including thermometers and data loggers.
Identify/classify	Identify similarities/differences/changes when talking about scientific processes.
Practicals	Make decisions about different enquiries, including recognising when a fair test is necessary and begin to identify variables. *Eggs left in different liquids
Reporting	Choose appropriate ways to record and present information, findings and conclusions for different audiences (e.g. displays, oral or written explanations). *Carroll diagrams
Conclusions	Use recorded data to make predictions, pose new questions and suggest improvements for further enquiries.
Analysing	Identify, with help, changes, patterns, similarities and differences in data to help form conclusions. Use scientific evidence to support their findings.

Working scientifically - Year 5

Year 5	Working scientifically objectives
Questions	Raise different types of scientific questions, and hypotheses. *Questions for a health expert
Predictions	Make predictions and give a reason using scientific vocabulary.

Observations	Plan and carry out comparative and fair tests, making systematic and careful observations.
Measuring	Take measurements using a range of scientific equipment with increasing accuracy and precision. *Measuring heart rate returning to normal
Identify/classify	Use and begin to create simple keys. Use and develop keys to identify, classify and describe living things and materials.
Practicals	Plan a range of science enquiries, including comparative and fair tests. *Measuring heart rate returning to normal
Reporting	Record data and results of increasing complexity using scientific diagrams, labels, classification keys, tables, bar and line graphs and models. Focus: Line graph (age and height link)
Conclusions	Use a simple mode of communication to justify their conclusions on a hypothesis. Begin to recognise how scientific ideas change over time.
Analysing	Use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas.

Working scientifically - Year 6

Year 6	Working scientifically objectives
Questions	Pose/select the most appropriate line of enquiry to investigate scientific questions.
Predictions	Make predictions and give a reason using scientific vocabulary. Base predictions on findings from previous investigations.
Observations	Make their own decisions about which observations to make, using test results and observations to make predictions or set up further comparative or fair tests.

Measuring	Choose the most appropriate equipment in order to take measurements, explaining how to use it accurately. Decide how long to take measurements for, checking results with additional reasoning.
Identify/classify	Identify and explain patterns seen in the natural environment.
Practicals	Select and plan the most suitable line of enquiry, explaining which variables need to be controlled and why, in a variety of comparative and fair tests.
Reporting	Choose the most effective approach to record and report results, linking to mathematical knowledge. Focus: Bar chart of inherited characteristics
Conclusions	Identify validity of conclusion and required improvement to methodology. Discuss how scientific ideas develop over time.
Analysing	Identify and explain causal relationships in data and identify evidence that supports or refutes their findings, selecting fact from opinion.