Girlington Primary School Science Curriculum

Purpose of Study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse cause.

Aims

The national curriculum for science aims to ensure that all pupils:

•develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics

•develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them

•are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	Make observations of animals and plants.	Identify common plants and trees and describing parts of a plant.	What do plants need to grow?	Seed dispersal	Classify and group living things.	To understand the life process of reproduction in some plants	Identify how plants adapt to their environment and can be classified in a variety of ways.
Animals including humans	Look closely at similarities and differences in relation to objects, materials.	Describe the human body Name and describe common omnivores, herbivores and carnivores.	What animals need to survive. Being healthy.	Skeleton and muscles	Digestive system	Changes as humans develop into old age	The circulatory system.
Materials	Explore different materials freely, to develop their ideas about how to use them. Talk about changes in materials.	Group, organise and describe different materials.	Explore how objects change shape and compare suitability.	Compare and group different rocks and understand how the earth is made of rocks.	Identify and recognise solids, liquids and gases.	Compare and group materials and understand reversible and irreversible changes.	
Light				Reflectors, light sources and how shadows are made.	Sound. How is sounds created and how does it travels?		Understand that light travels in straight lines and is reflected off objects so we can see them.
Forces and Magnets				Comparing how things move on different surfaces and comparing and observing magnets.		To recognise the impact of gravity. To explain how different mechanisms, create different movements.	
Electricity					How a simple electric circuit works.		Understand variation in circuits and the impact they have.

Girlington Primary School Science Curriculum

Scientific enquiry skills					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
• Observe, describe and compare using simple science words • Sort things • Ask science questions • Collect evidence to answer some questions • Measure using non-standard units • Test out ideas with help • Talk about what might happen and what they found out • Write and draw about science • Record on a simple table	• Observe, describe and compare using Year 2 and the previous year group's vocabulary (see curriculum map) • Sort and order observations • Ask scientific questions and use information to help answer them • Plan how to collect data to answer questions, with help • Measure using non-standard, then standard units • Talk about what might happen and compare it to what did happen • Plan a simple fair test, with help • Test out their own/someone else's ideas • Explain why (in a simple way) • Record information on tables and block charts Talk, write and draw about science	• Observe, describe and compare using Year 3 and previous year group's vocabulary (see curriculum map) • Group and order observations giving scientific reasons • Ask scientific questions and use information/collect data to answer them • Predict what might happen and begin to explain why using everyday ideas • Measure in standard units • Test out their own/someone else's ideas • Plan a fair test with help • Explain observations using cause and effect • Draw simple tables and bar charts to record their own observations/data • Talk about observations/results and begin to use scientific facts to explain them • Find and talk about simple patterns in results • Communicate findings in a variety of ways • Talk about how to improve their own work	• Observe, describe and compare using Year 4 and previous year group's vocabulary (see curriculum map) • Group and order observations giving scientific reasons • Collect evidence/find information to test out an idea/prediction or answer a question • Predict what might happen and begin to explain why using everyday ideas and scientific facts/ideas • Measure in standard units • Select equipment, with help • Plan ways to test out their own/someone else's ideas • Set up a fair test and explain why it is important to do so • Draw tables and bar charts to record observations/data • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify and explain simple trends and patterns in results • Communicate findings in a variety of ways • Talk about how to improve their own work	• Observe, describe and compare in careful detail using the Year 5 vocabulary and the previous year group's vocabulary. (see curriculum map) • Sort and classify with precise reasons. • Make predictions and explain why • Plan how to collect evidence/information/data to test out an idea/prediction or answer a question • Measure precisely in standard units • Select the most suitable equipment for the task • Plan ways to test out their own/someone else's ideas • Set up and carry out fair tests • Repeat observations and measurements • Draw tables, bar charts and simple line graphs to record observations/data • Interpret and predict from bar charts and line graphs • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify trends and patterns in data and explain using scientific facts and ideas • Begin to identify scientific evidence that has been used to support or refute ideas or arguments • Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it • Talk about how to improve their own work giving reasons	• Observe, describe and compare in careful detail using the correct language. This includes Year 6's vocabulary and all the previous year group's vocabulary (see curriculum map). • Sort and classify with precise reasons • Make predictions based on scientific facts and ideas • Collect evidence/information/data to test out an idea/prediction or answer a question from a wide range of sources • Measure precisely in standard units • Select the most suitable equipment for the task • Plan ways to test out their own/someone else's ideas • Independently set up and carry out fair tests • Decide when to repeat observations and measurements • Choose the most appropriate way to record and present results • Interpret and predict from bar charts and line graphs • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify trends and patterns in data that do not fit and explain using scientific facts and ideas • Identify scientific evidence that has been used to support or refute ideas or arguments • Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it • Evaluate their work and suggest ways to improve their work giving reasons
Statistics Simple drawings to show their findings. Eg. Different colours and sizes. Simple tables.	**Statistics** Pictograms Tally charts Block diagrams	**Statistics** Tables Bar charts	**Statistics** Time graphs	**Statistics** Line graph	**Statistics** Pie charts Scatter graphs

Girlington Primary School Science Curriculum

Year 1

Term	Autumn 1	Autumn 2	Spring 2	Summer
Prior EYFS Learning	Know how a seed grows Know how to care for living things.	Explore materials with different properties Explore natural materials indoors and outdoors Explore different materials freely, to develop their ideas about how to use them and what to make. Join different materials and explore different textures. Explore materials with similar or different properties	Know and recognise different weather Explore the natural world around them Understand the effect of changing seasons on the natural world around them	Use all their senses to explore natural materials Be able to name animals Know how to care for a living thing Know the lifecycle of a frog, butterfly and duck. Describe what they see, hear and feel outside
Topic	**Plants**	**Materials**	**Seasonal changes**	**Animals Inc. Humans**
National Curriculum Subject Content	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.	Compare and group together a variety of everyday materials on the basis of their simple physical properties. Describe the simple physical properties of a variety of everyday materials. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Distinguish between an object and the material from which it is made.	Observe and describe weather associated with the seasons and how day length varies. Observe changes across the four seasons.	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 and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). 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.
What I want the children to be able to do by the end of Y1	Identify and name plants (common and wild) Name the parts of a plant. Talk about and describe different plants.	Identify and name a variety of materials. Talk about and describe different objects/materials. Compare objects/materials. Group objects/materials (giving their own reasons).	Talk and notice the seasons throughout the year. Talk about and describe the seasons. Talk about how day length changes over the year. Observe and describe the weather throughout the year.	Identify and name parts of their body. Talk about their senses and how they use them in everyday life. Identify and name common animals. Describe and compare animals. Talk about what animals eat.
Love to investigate questions.	Why are plants important? (observing over time) Where do new plants come from? (grouping and classifying) Are all trees the same? (Grouping and classifying) What's a bud? (Research)	What is a natural material? (Research) What materials are objects made from? (classifying and grouping) What is the best material for bunting? Which material is flexible and waterproof? (Comparative test) How does it feel? (Pattern seeking)	Observe how weather/day length change over the seasons (observing over time) Observe how deciduous trees change throughout the year. (observing over time. Investigate the weather across a week. (observing over time) Answer the following questions - Which day was the windiest? - Which day was the hottest? - Which day was the coldest? - Which day had the most rain?	What are you? (research) Research into the structure of different animals (fish, amphibians, reptiles, birds & mammals). Create their own questions to group and sort animals. (classifying and grouping)
Activities	Recall information about what they have learnt about plants from EYFS Explore and identify plants in the school garden. Dissect plants and find the main parts. (see vocabulary) Reading relevant books that identify common plants. Compare seeds and bulbs and group them. Draw pictures of seeds and bulbs and discuss how they are different. Label seeds and bulbs from what they know. Explore and observe evergreen and deciduous plants and trees in the local environment. Sort the trees and their leaves into deciduous and evergreen. Describe the difference. Look at these trees throughout the year and observe how they change. Plant their own seeds and watch it grown over time. Describe the changes.	Identify natural materials and explore them using scientific equipment. Compare and explore man-made materials and compare them to natural materials. Using hoops and trays to group everyday materials and name them. Ask the children to create their own groups for sorting everyday materials. Identify and name what an object is made from, including wood, plastic, glass, metal and water. Describe the features of materials using the Year 1 vocabulary. Investigate materials to find the best one suited for a job. (bunting) Using the appropriate materials to make a toy vehicle (Link to Design & Technology)	Explore the environment and collect items. Discuss how these items might change. Walk and notice the different types of trees evergreen and deciduous. (Link with plants) Take a trip to explore a different environment. Explore how seasons impact animals. Investigate "How wild is the wind?" using observing over time. Measure the temperature at different times and on different days. Compare their findings. Children to ask their own questions about rain. Gather them together as a class and look at answering them through observation or measurement. Explore the weather forecast and what that tells us.	Name the different parts of the body. Draw around their own body and label the different parts. Explore the basic parts of the body and how they vary from person to person. Explore their own senses and think about how animals use their senses in the same way or differently. Discuss how some body parts and senses do not work as they should. Explore different animals and how there are a variety of types. Allow the children to group pictures or toy animals. Give them a variety of ways in which they could group them. Use VENN diagrams to help them group. Give them groups to sort animals and introduce fish, amphibians, reptiles, birds and mammals. Example- Does the animals lay eggs? Research what animals eat and explain how this helps us to groups them into omnivores, herbivores and carnivores. Visit and zoo and find out what different animals eat at the zoo. Ask members of staff to share how they look after their animals.

Girlington Primary School Science Curriculum

Vocabulary	Leaf, flower, Blossom, Petal, fruit, roots, seed, branch, trunk, stem.	Soft, Hard, Rough, Smooth, Stretchy, Stiff, Shiny, Dull, Flexible, Waterproof	Weather, Seasons, Temperature, Sunrise, Sunset	Senses, skeleton, sight, touch, taste, hearing, smell Fish, Amphibian, Reptile, Mammal, Bird, Skin, Scales, Fur, Feathers
Scientific enquiry skills	• Observe, describe and compare using simple science words • Sort things • Ask science questions • Collect evidence to answer some questions • Measure using non-standard units • Test out ideas with help • Talk about what might happen and what they found out • Write and draw about science • Record on a simple table			

Girlington Primary School Science Curriculum

Year 2

Term	Autumn 1	Autumn 2	Spring 1	Spring 2
Prior EYFS Learning	Know how a seed grows Know they need to respect and care for our indoor and outdoor environment Know how to care for a living thing	Notice patterns with strong contrasts and be attracted by patterns resembling the human face.	Explore natural materials indoors and outdoors Manipulate and play with different materials. Join different materials and explore different textures. Explore materials with similar or different properties Use all their senses to explore natural materials	Know the lifecycle of a frog and butterfly Know how to care for a living thing Be able to name animals Know the lifecycle of a duck.
Topic	**Plants**	**Animals Inc. Humans**	**Uses of everyday materials**	**Living things and their habitats**
National Curriculum Subject Content	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.	Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Notice that animals, including humans, have offspring which grow into adults. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Link to design technology)	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.	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. Identify and name a variety of plants and animals in their habitats, including microhabitats. 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. Explore and compare the differences between things that are living, dead, and things that have never been alive.
What I want the children to be able to do by the end of Y2	Describe different seeds and bulbs– what they look like, what they grow into and how we use the plant. Observe and describe how seeds and bulbs grow. Find out and describe what needs to grow and keep healthy.	Talk about babies and their parents. Find out about and describe what humans need to live. Talk about and describe how to look after themselves – what foods are best to eat; why we need to exercise; why and how to keep clean. Talk about baby animals and their parents. Describe how baby animals change as they grow. Find out about and describe what animals need to live.	Talk about the properties of everyday objects/materials. Explain which object is the most suitable for a task Explain which material is the most suitable for an object? Observe and describe how some materials can be changed by squashing, bending, twisting, and stretching.	Talk about and describe different habitats, and the animals and plants that live there. Describe how animals and plants get what they need to survive from their habitat. Order a simple food chain. Say if something is living, dead or never been alive.
Love to Investigate questions	Can seeds grow anywhere? Growing seeds in different location with different factors missing to compare the difference. (Comparative testing) Do bigger seeds take longer to germinate than smaller seeds? (Observing overtime and comparative testing) Where do plants like to grow? (Pattern Seeking) What do plants need to grow? (Comparative testing)	Observing animals grow over time (observing over time) How do germs spread? (Think with PHSEE)	Identifying and classifying uses of different materials. (classifying and grouping) Will it degrade? (observing over time) Which is the best type of paper for wrapping? (Classifying and grouping, pattern seeking) Will these materials return to their original shape? (researching and classifying) Which material is best for a bouncy ball? (Comparative test)	Compare the differences between things that are living, dead, and things that have never been alive. (Classifying and grouping) Research the life cycle of an animal. (research)
Activities	Explore what you would find in a garden and how we look after plants. Children to plant their own seeds. Investigate the best location for seeds to grow and answer the question "Can a seed grow anywhere?" Take away different factors (eg. Sunlight) and ask the children to predict what will happen. Plant different seeds and link to the question "Do bigger seeds take longer to grow?" Watch the seeds daily and compare. Create a block graph to show the results and write their own conclusion. Investigate where grass grows the best in our school. Look and explore the conditions and create their own conclusion. Describe why the grass grows better in certain areas and apply the knowledge they have learnt about what plants need to grow.	Explore what humans need to be healthy and stay alive. Sort items into those that we need and those that we want but don't need. Talk about lifecycles. Looking at the lifecycles describe how animals change. Create simple food chains to show how animals get their food. Children to answer the question "how do germs spread?" Children to touch flour or glitter and move around the classroom. Afterwards, looking at how the flour or glitter that is on their hands is now all over the classroom. Compare this to germs. Research why we need exercise and what makes a healthy diet. Create a healthy and nutritious drink. (Linking to design technology)	Investigate "Will it degrade?" Compare what they looked like at the start and after different periods of time. Investigate "Can you make a paper bridge?" Investigate how to make a lump of plasticise float and use this as an opportunity to explore the different language. Sort, group and classify a range of objects using the vocabulary specified below. Group the objects according to whether they are alive, dead or have never been alive. Observe these objects over time to see if they change. Predict which materials can be bent, stretched, twisted and squashed. Once they have predicted children should test if they are correct. Explore the properties of different types of paper. Which is the best wrapping paper? Sort and order objects from the strongest, roughest and how absorbent they are. Children to describe the materials using the vocabulary they have learnt. Investigate the best material for a bouncy ball. Complete a comparative test to see which ball bounces the highest.	Investigate the question "Where does our food come from?" and conclude that it either comes from a plant or an animal. (Link with Design Technology) Compare and groups things that are living or dead or never been alive. Walk through a woodland habitat and discuss the following questions. What animals and plants live there? What food is there for the animals to eat? Where can they get their water? Where can animals shelter to stay safe? Research the 7 processes of being a living organism. Group animals into predator and prey and describe their characteristics. Research some fact files about different habitats and the animals that live there to find out which animals live in different habitats, what the habitats are like, and how the animals survive.

Girlington Primary School Science Curriculum

Vocabulary	bulb, shoot, germinate, bud, soil, temperature, growth, flowering, non-flowering.	Offspring, survival, exercise, healthy, unhealthy, diet, hygiene, adult, survive, feeding, drinking, breathing, exercise, hygiene	see-through, transparent, translucent, opaque, absorbent, suitable, unsuitable, flexible, rigid	habitat, hicro-habitat, food chain, environment , adaptation, shelter
Scientific enquiry skills	• Observe, describe and compare using Year 2 and the previous year group's vocabulary (see curriculum map) • Sort and order observations • Ask scientific questions and use information to help answer them • Plan how to collect data to answer questions, with help • Measure using non-standard, then standard units • Talk about what might happen and compare it to what did happen • Plan a simple fair test, with help • Test out their own/someone else's ideas • Explain why (in a simple way) • Record information on tables and block charts • Talk, write and draw about science			

Girlington Primary School Science Curriculum

Year 3

Term	Autumn 1	Spring 1	Spring 2	Summer 1	Summer 2
Prior EYFS Learning	Notice patterns with strong contrasts and be attracted by patterns resembling the human face.	Explore different materials, using all their senses to investigate them. Manipulate and play with different materials Use all their senses to explore natural materials	Use all their senses to explore natural materials	Know how a seed grows Know they need to respect and care for our indoor and outdoor environment Know how to care for a living thing	Explore materials with similar or different properties Be able to talk about what they see around them
Topic	**Animals Inc. Humans**	**Rocks**	**Forces and Magnets**	**Plants**	**Light and Shadow**
National Curriculum Subject Content	Identify that humans and some other animals have skeletons and muscles for support, protection and movement. 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. (Link to Design and Technology)	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.	Compare how things move on different surfaces. Predict whether two magnets will attract or repel each other, depending on which poles are facing. Describe magnets as having two poles. 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. Observe how magnets attract or repel each other and attract some materials and not others. Notice that some forces need contact between two objects, but magnetic forces can act at a distance.	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Investigate the way in which water is transported within plants. 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. Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.	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 a solid object. Find patterns in the way that the size of shadows change.
What I want the children to be able to do by the end of Y3	Talk about their skeleton (and the skeletons of other animals) and the job it does. Talk about how muscles help us move. Talk about how animals and humans get their nutrition. Talk about what types and amount of nutrition animals and humans needs.	Describe how rocks are formed in a simple way – link to Geography Observe, describe, and compare rocks. Group and order rocks (hardness, weight, length) Explain why rocks have been used for a specific purpose. E.g. Marble for statues Describe how fossils were formed. Observe, describe, and compare soils (When teaching plants talk about the correct soil type).	Say what a force is. Describe how things move on different surfaces. Measure forces using a force meter and record data in a table. Observe and describe magnets and their force. Compare and group objects/materials into magnetic and non-magnetic.	Describe the functions of parts of flowering plants. Describe how a variety of plants need different things to live. Describe the life cycles of plants and the role of the flower. Observe and describe how water is transported through plants.	Talk about how we need light to see and how dark is the absence of light. Name some sources of light. Talk about materials that reflect light and how this can be useful/not useful. Talk about how to protect our eyes from the sun and why this is important. Explain how to make a variety of shadows e.g. vary size, clarity and shape.
Love to Investigate questions	What are joints for? (research) Identifying and grouping animals with and without skeletons (classifying and grouping) Which muscles are you using? (Observing over time and research)	Research how fossils are formed (research) Compare and group together different kinds of rocks based on their appearance and simple physical properties. (classifying and grouping)	How mighty are metals? (Comparative test) Can you block a magnet? (Pattern seeking) Which surface does the car travel the furtherest on? (comparative test) Asking their own questions about magnets and researching using books and the internet. (research)	What are flowers for? (research) Do plants have legs? (pattern seeking) Observe coloured water travelling up plants stem (Observing over time) What is the life cycle of a flowering plant? (observing over time)	How do we create shadows? (research) Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. (Pattern seeking)
Activities	Look at a skeleton. Identify the key bones on themselves. Draw around their friend and identify where the different bones are. Complete different exercises and identify the muscles that are being used to help you move. Explore "What are joints for?" Children to try to complete everyday tasks without bending. Children to complete their own moving hand to understand how the joints allow different movements. Group animals in to endoskeletons, exoskeletons and no skeletons. Research the diet of different animals.	Research the different layers of the earth and know that it is all made from different types of rock. Group, compare and describe a variety of rocks using the year 3 vocabulary. Describe rocks using the appropriate scientific vocabulary. Research the different types of soil and look around the school site to see if they can locate the different types. Use the key to identify different types. Discuss why rocks are important to everyday life.	Organise push and pull forces. Children to investigate if they have more push or pull forces in the classroom. Investigate which material will make the car go the fastest. Describe the material that allows the quickest movement and measure which car goes the furthest. Predict and then use force meters to measure how much force is needed to move a shoe on different surfaces. Define and understand what a magnet is. Explore the words attract and repel. Use scientific enquiry skills to explore "which magnet is the mightiest?" using the following investigations to explore magnetic field. - Distance to attract a paperclip. - How many paper clips can the magnet attract? - Which has the biggest magnetic field? Use scientific enquiry skills to explore "Can we block magnetism?" The children will investigate if there are any objects that will stop the magnet attracting the paperclip. Explore the word "pole" and how we hear it in different contexts. Investigate how the north and south pole attract and repel. Ask their own questions about magnets and complete their own research to find the answers.	Explore "What are flowers for?" Research and record information about why plants are important and what the flower is used for. Children to dissect and label flowers. Looking at the different female and male parts not covered previously. Look for the parts involved in pollination building upon the parts they have explored in Year 1. (See vocabulary below. Explore "Do flowers have legs?" Research different types of seed dispersal. Children to group and sort different seeds based on their shape. How would their seed disperse? Order the plant life cycle of a tomato plant and talk about the process of germination. Plant it in the garden and watch it grown over time. Observe food dye travelling up a white flower. Watch this over time to discover how plants transport water.	Organise objects into light sources or reflectors. Use torches and objectives to discover how shadows are formed. Measure the size of shadows depending on the distance from the light source. Predict and then record their findings. Investigate which materials create shadows, group and label them. (transparent, opaque and translucent) Read the dangers of UV rays to their eyes and their bodies. (Reading lesson)

Girlington Primary School Science Curriculum

Vocabulary	Nutrition, support, protection, movement, spine, ribcage, pelvis, skull, muscle, contract Vertebrate, Invertebrate, Nutrition, Skeleton, Muscle, Support, Protection, Movement	Magma, Lava, Metamorphic, Sedimentary, Igneous, Crust, Fossil, Decay, Grains, Crystals, permeable, impermeable	Force, Attract, Repel, Magnetic, Non-magnetic, Magnetism, Pole Friction, Force meter/Newton meter	Function, absorb, nutrients, life cycle, pollen, pollination, pollinator, reproduce, dispersal	Light, Dark, Reflect, Reflective, Non-reflective, Shadow, Source Revise from Y2 – transparent, translucent, opaque
Scientific enquiry skills	• Observe, describe and compare using Year 3 and previous year group's vocabulary (see curriculum map) • Group and order observations giving scientific reasons • Ask scientific questions and use information/collect data to answer them • Predict what might happen and begin to explain why using everyday ideas • Measure in standard units • Test out their own/someone else's ideas • Plan a fair test with help • Explain observations using cause and effect • Draw simple tables and bar charts to record their own observations/data • Talk about observations/results and begin to use scientific facts to explain them • Find and talk about simple patterns in results • Communicate findings in a variety of ways • Talk about how to improve their own work				

Girlington Primary School Science Curriculum

Year 4

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Prior EYFS Learning	Describe what they see, hear and feel outside	Know how to care for a living thing	Explore natural materials indoors and outdoors Explore different materials freely, to develop their ideas about how to use them and what to make. Join different materials and explore different textures. Explore materials with similar or different properties	Know the lifecycle of a frog and butterfly Know they need to respect and care for our indoor and outdoor environment Know how to care for a living thing Be able to name animals	
Topic	**Sound**	**Animals Inc. Humans**	**States of matter**	**Living things and their habitats**	**Electrical circuits and conductors**
National Curriculum Subject Content	Recognise that vibrations from sounds travel through a medium to the ear. Recognise that sounds get fainter as the distance from the sound source increases. Find patterns between the volume of a sound and the strength of the vibrations that produced it. Find patterns between the pitch of a sound and features of the object that produced it. Identify how sounds are made, associating some of them with something vibrating.	Construct and interpret a variety of food chains, identifying producers, predators and prey. Identify the different types of teeth in humans and their simple functions. Describe the simple functions of the basic parts of the digestive system in humans.	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. 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). Compare and group materials together, according to whether they are solids, liquids or gases.	Recognise that living things can be grouped in a variety of ways. Recognise that environments can change and that this can sometimes pose dangers to living things. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.	Recognise some common conductors and insulators, and associate metals with being good conductors. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. 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. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify common appliances that run on electricity.
What I want the children to be able to do by the end of Y3	Observe, describe, measure and order sounds. Identify how sounds are made. Explain how sounds travel. Describe how volume and pitch are produced by a variety of simple instruments. Describe how sounds get fainter as the distance from the sound source increases. Explain how the ear works and how we can protect our hearing (it is not necessary to draw or label diagrams of the ear).	Identify and describe the functions of the different types of teeth. Talk about their teeth and how to care for them. Compare human teeth with those of other animals. Identify, name, and order the main parts of the digestive system. Describe the function of each part of the digestive system.	Identify, compare, and group solids, liquids, and gases. Describe the properties of solids, liquids, and gases. Describe what happens when objects melt, freeze, or solidify. Describe what happens when liquids evaporate and condense. Describe the water cycle – Link to geography. Measure temperature.	Group animals & plants in a variety of ways and give reasons e.g. flowering/ non-flowering. Identify plants and animals using a classification key. Construct classification keys to help others to identify animals & plants. Construct and interpret a variety of food chains, identifying producers, predators, and prey. Give examples of how an environment has changed (positively and negatively) due to humans or nature.	Identify objects that use electricity. Make an electrical circuit and name the components. Control a circuit using a switch. Identify and classify conductors and insulators. Predict whether a circuit with a lamp will work from pictures and test your prediction. Explain the risks when using electricity.
Love to Investigate questions	How far can sound travel? (Pattern seeking) Can we change a sound? (research) Can we block a sound? Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. (pattern seeking)	How does toothpaste protect teeth? (comparative test) Research the teeth of different animals and what their diet includes. (research)	Where does rain come from? (research and observing over time) Use the data loggers to explore temperature and water changing state. (Pattern seeking)	Using and making simple guides or keys to explore and identify animals. (grouping and classifying) How do invasive species impact the environment? (research)	What conducts electricity? Investigate which materials are conductors and which are insulators. (comparative test)
Activities	Explore musical instruments and the noise they make. Describe how vibrations create sound. Explore a guitar and how the tightness or looseness of the strings create different vibrations and therefore different pitches (links to music) Investigate "How can we change a sound?" Children will carry out different tests to explore how pitch can change. Listen to sounds from different locations and notice the different in the volume. Children to create their own conclusion for how and why the volume is different. Explore the relationship between pitch and vibrations. Use tuning forks to explore different vibrations and pitch.	Identify and label their own teeth and different diagrams. Identify how plaque on our own teeth and understand why brushing our teeth is important. (research) How do we digest our food? (research) Eat a variety of food and identify which teeth are suitable for each food. Research how these vary in different animals depending on their diet. Research the functions of each part of the digestive system. - Mouth - Oesophagus - Stomach - Liver - Large intestine - Small intestine - Rectum Explore characteristics of different animal's diets and why they are different. Research different animals digestive systems and why they are different to ours. Order the main parts of the digestive system. Make a presentation describing the digestive system and its functions.	Identify different solids, liquids and gases. Describe the characteristics of solids, liquids and gases. (draw diagrams to show) Boil the kettle and explore how the temperature changes over time. Observe ice and how the temperature changes over time. Show models of evaporation, condensation, melting and freezing. Use the data loggers to explore temperature and water changing state. (Pattern seeking) Creating their own water cycle in the classroom. Observe the water cycle over time and apply to "where does rain come from?" Predict the melting points of different solids including metals. Share findings on a table.	Group and classify invertebrates and vertebrates. Classify vertebrates further by asking questions. Use a classification key to group invertebrates and use this key to identify them in the local environment. Create a bank of questions to further group. Research changing environments and how thy can endanger living things. Split these into natural and human changes.	Explore and sort common appliances that use electricity. Identify the basic parts needed to build a simple circuit. Build a simple circuit and name the key components. Investigate what materials are insulators and which are conductors. Spot the properties of the materials that conduct electricity. Create a switch in a circuit and describe how a switch works. Apply knowledge when making a simple circuit when creating a nightlight for DT.

Girlington Primary School Science Curriculum

Vocabulary	Sound wave, Vibrate, Vibration, Eardrum, High pitch, Low pitch	Digestive system, digestion, incisor, canine, molar, oesophagus, stomach, intestine, rectum, anus Prey, Predator, Producer, Consumer, Decomposer, Omnivore, Carnivore, Herbivore, Energy, Nutrients	Matter, Solid, Liquid, Gas, Evaporation, Evaporate, Condensation, Temperature, Solidify	Classify, Classification, Key Revise: vertebrate, invertebrate, mammal, amphibian, reptile, bird, fish, flowering, non-flowering Impact	Appliance, Circuit, Electrical/electricity/electric, Cell, Wire, Buzzer/Motor, Battery, Switch, Conductor, Insulator
Scientific enquiry skills	• Observe, describe and compare using Year 4 and previous year group's vocabulary (see curriculum map) • Group and order observations giving scientific reasons • Collect evidence/find information to test out an idea/prediction or answer a question • Predict what might happen and begin to explain why using everyday ideas and scientific facts/ideas • Measure in standard units • Select equipment, with help • Plan ways to test out their own/someone else's ideas • Set up a fair test and explain why it is important to do so • Draw tables and bar charts to record observations/data • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify and explain simple trends and patterns in results • Communicate findings in a variety of ways • Talk about how to improve their own work				

Girlington Primary School Science Curriculum

Year 5

Term	Autumn 1	Autumn 2	Spring	Summer 2
Prior EYFS Learning	Explore the natural world around them	Explore materials with similar or different properties	Use all their senses to explore natural materials Know the lifecycle of a frog and butterfly. Know the lifecycle of a duck Be able to talk about what they see around them Know how a seed grows	Explore natural materials indoors and outdoors Manipulate and play with different materials. Explore different materials freely, to develop their ideas about how to use them and what to make. Join different materials and explore different textures. Explore materials with similar or different properties Use all their senses to explore natural materials
Topic	**Earth and Space**	**Forces**	**Animals Inc. Humans Living things and their habitats**	**Properties and changes of materials**
National Curriculum Subject Content	Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. Describe the Sun, Earth and Moon as approximately spherical bodies. Describe the movement of the Moon relative to the Earth. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.	Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	Describe the changes as humans develop to old age Describe the life process of reproduction in some plants and animals. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.	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. 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. Demonstrate that dissolving, mixing and changes of state are reversible changes. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
What I want the children to be able to do by the end of Y5	Name and describe the sun and the planets (saying that Earth, sun, and moon are spherical). Use a model to explain day and night. Explain why the sun appears to rise and set. Use a model to explain how the Earth and moon orbit the sun. Talk about weightlessness in space and the pull of gravity on earth (part of forces). Describe how scientist's thinking about space as changed over hundreds of years.	Say what gravity is and how it affects things on earth (NB this may have been covered in Earth and Space). Use diagrams to identify and explain the effects of water resistance. Use diagrams to identify and explain the effects of air resistance. Use diagrams to identify and explain the effects of friction. To say that levers, pulleys and gears are simple machines To explore how levers, pulleys and gears work. To explain how each of these simple machines work by taking a force and making it bigger.	Name and order the different stages of human life e.g. foetus, new born, child, adolescent, adult, old age Compare two or more stages (E.g. new born and adolescent) Describe the changes of humans from birth to old age Explain the changes during puberty for boys and girls (The following may be covered during RSE or PSHEE) Describe the life cycles of a mammal, amphibian, insect and bird. Describe the differences the life cycles of the above. Say that plants reproduce in 2 ways – asexual and sexual. Give a simple explanation of sexual and asexual reproduction in plants. Describe reproduction in some animals.	Carousel of activities to recap previous learning as follows: Compare and group everyday objects based on their properties. Group together materials that are magnetic & non-magnetic (recap Y3). Group together materials that are electrical conductors/insulators. Order materials from transparent to opaque. Order materials from softest to hardest. Describe the properties of solids, liquids, and gases. Explain how materials can be recovered through evaporation. New learning Explain what thermal conductivity is and which materials provide insulation. Describe what a solution is and what a mixture is. Explain the difference between soluble and insoluble. Explain what dissolving means and give examples of materials which dissolve. Explain what filtering and sieving are and give examples. Explain how materials can be recovered from solutions or mixtures through evaporation, filtering and sieving. Give examples of reversible and non-reversible changes. Identify that some non-reversible changes can result in the formation of new materials (bicarbonate of soda and vinegar and burning)
Love to Investigate questions	Why do planets have different sized craters? Present their own findings. Link to forces. (Comparative test) Why do we have night and day? (research) Modelling proven theories Labelled scientific diagrams	Which animal will travel quickest through the water? (comparative testing, improving their work through repeated testing) Investigate air resistance and which parachute will be most effective for Neil Armstrong. (Problem solving, comparative test)	Researching gestation periods of different mammals- Bar Charts (research) Do our reaction times change as we get older? (Pattern seeking)	Do all solids dissolve? (comparative test) Investigate dissolving of salt/sugar. Patterns in time taken to dissolve with different temperatures/ different sizes of sugar/ stirring or not stirring.(Pattern seeking and comparative test) Can you clean dirty water? (problem solving) Which materials conduct heat? (pattern seeking)
Activities	Research the order of the planets from the sun. Create model of the planets and research the time taken to orbit the sun. Children to research their own questions about the planets and their rotation. Ask questions about why we have night and day and research their own answers. Research the phases of the moon and how the moon rotates around the Earth. Use reasoning questions to prove and disprove statements about why we have day and night etc.	Use the scooters to explore friction and see which surface they move the quickest on. Build on from year 3 and use the word friction. Investigate air resistance and how would you slow down a Space module landing back on Earth. Investigate water resistance by seeing which animal will travel the quickest through water. Make their own levers using a ruler and explore the position of the fulcrum and when it requires the most effort.	Explore gestation periods in different animals. True or false – The larger the animal the longer the gestation/ Describe changes as we get older. Investigate if our reaction times get slower as we get older. Draw and label a variety of life cycles. Describe the different life cycles with detail and appropriate vocabulary (see vocabulary). Compare and find similarities and differences between the different life cycles.	Recap what the children have learnt about materials and their properties so far. Check children's understanding on transparency (year 3) and electrical conductors (Year 4). Investigate which materials are thermal conductors. Use the data loggers to investigate thermal insulators. Display findings on a line graph. Discuss the word soluble and what it means. Predict which materials are soluble and investigate to see if they are correct. Create a mixture of different materials. Make sure some of them are soluble and insoluble. Ask the children if they can separate them back into their original form. Give them a variety of equipment to explore and use. (sieve, filter paper etc). Look at evaporating to separate. Explore reversible and irreversible change.

Girlington Primary School Science Curriculum

Vocabulary	Axis, Tilt, Orbit, Rotate, Rotation, Spherical, Planet, Solar system, Reflect	Air / Water resistance, Up thrust, Gravity, Springs, Lever, Fulcrum Pulley, Gear, Stream lined – Drag Mechanism/machine	Gestation, embryo, foetus, childhood, adolescence, puberty, life expectancy, reproduction	Insulator, Conductor, Thermal, Reversible, Irreversible, Dissolve, Filter, Sieve, Solution, Soluble
Scientific enquiry skills.	• Observe, describe and compare in careful detail using the Year 5 vocabulary and the previous year group's vocabulary. (see curriculum map) • Sort and classify with precise reasons. • Make predictions and explain why • Plan how to collect evidence/information/data to test out an idea/prediction or answer a question • Measure precisely in standard units • Select the most suitable equipment for the task • Plan ways to test out their own/someone else's ideas • Set up and carry out fair tests • Repeat observations and measurements • Draw tables, bar charts and simple line graphs to record observations/data • Interpret and predict from bar charts and line graphs • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify trends and patterns in data and explain using scientific facts and ideas • Begin to identify scientific evidence that has been used to support or refute ideas or arguments • Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it • Talk about how to improve their own work giving reasons			

Girlington Primary School Science Curriculum

Year 6

Term	Autumn 1	Spring 1	Spring 2	Summer 1	Summer 2
Prior EYFS Learning	Know how to care for a living thing	Explore the natural world around them	Be able to talk about what they see around them Know they need to respect and care for our indoor and outdoor environment Know how to care for a living thing Be able to name animals	Explore natural materials indoors and outdoors Explore materials with different properties' Explore different materials, using all their senses to investigate them. Manipulate and play with different materials.	Join different materials and explore different textures.
Topic	**Animal Inc. Humans**	**Evolution and Inheritance**	**Living things and their habitats**	**Light**	**Electricity**
National Curriculum Subject Content	Describe the ways in which nutrients and water are transported within animals, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. 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 that objects are seen because they give out or reflect light into the eye. Recognise that light appears to travel in straight lines.	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Use recognised symbols when representing a simple circuit in a diagram. 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.
What I want the children to be able to do by the end of Y6	Identify and name the main parts of the circulatory system. Describe the functions of the blood, blood vessels and the heart. Explain how diet, exercise, drugs and lifestyle affect the way our bodies function. Describe how nutrients and water are moved in humans and other animals.	Explain how fossils provide information about the past, giving examples of things that lived millions of years ago and the fossil evidence we have to support this. Say that all living things have offspring of the same kind, but the offspring are not identical to their parents and vary from each other. Give examples of how plants and animals have adapted to suit an environment Explain the process of evolution. (E.g. by using Darwin's finches or peppered moth).	Describe how living things are classified (into 4 Kingdoms - Micro-organisms, animals, plants and fungi). Give reasons why animals are classified into different groups. Give reasons why plants are classified into different groups. Explain what micro-organisms are and how they help or hinder us.	Say how light travels. Use a diagram/model to explain how we see things when light travels from a light source to our eyes. Use a diagram/model to explain how we see things when light travels from a light source, onto an object, and then reflects to our eyes. Use a diagram/model to explain how shadows are formed.	Make an electric circuit, including a switch (recap Y4). Change the components in a circuit and explain what effect it has. Explain which materials are conductors and insulators (recap Y5). Draw circuit diagrams using the correct symbols. Describe the effect of the voltage of cells on components in a circuit (e.g brightness of a bulb, volume of a buzzer). Explain how to keep safe around electricity.
Love to Investigate	How does blood flow? (research) How does your pulse rate change after exercise? (comparative test) Line Graph	Why do birds have different beaks? (pattern seeking) Why di giraffes have long necks? (Research) Research Charles Darwin and Alfred Wallace developed their ideas on evolution. (research) Create and investigate their own hypothesis about inherited features. (pattern seeking)	Why are things classified? (research) Use classification systems and keys to identify some animals and plants in a cold environment. (classifying and grouping)	How does light travel? (research) Can we change the direction of light? (pattern seeking) Using a light intensity equipment, measure the reflected light intensity for different paper colours. Find the mean after 3 recordings. (comparative test)	Does the number of cells affect the brightness of a bulb in the circuit? (comparative test) Investigate how voltage affects the brightness of the light or loudness of buzzers using a voltmeter. (comparative test)
Activities	Describe how unhealthy choices and substances can have an impact on the body. To explain the function and the role of the heart within the body. Measure and compare heart rate and create their own hypothesis. Create their own investigation to explore heart rate. Eg type of exercise, or heart rate recovery. Does my HRR double if I do twice as much exercise? Does drinking water after exercise affect my HRR? Does my resting position after exercise affect my HRR? Does age affect the HRR?	Recap Year 4 classifying living things and Year 3 fossils. Children to explore and recall the theory of evolution. Children can explain inherited and non-inherited features and collect data to support this. Complete the adaptation in bird's beaks test and this this to survival of the fittest. Use a birds beak to predict what diet the bird has. Research the peppered month and how it changed over time. Explain why the change happened. Use the theory of evolution to describe why giraffes have long necks. Compare plants and their adaptations. Sort characteristics into intertied and not inherited. Children to add their own from their research. Children to generate a testable hypothesis they can investigate as a class or group, such as 'Females are taller than males', 'Brown-eyed children also have brown hair' or 'People with larger hand spans also have larger feet'. Work with the children to generate a testable hypothesis, ensuring it measures inherited features and not those affected by the environment. After children have collected their data, explain that they need to display their data using graphs and charts to identify if their hypothesis was correct. Create a short report or presentation to share their results on their own scientific hypothesis.	Use a variety of sources to find out how animals are adapted to their environment. Research the different kingdoms - Animal - Plant - Fungus - Protista - Monera Use keys to identify which kingdom the organism belongs to. Explain their reasoning. Construct food chains for a chosen animal or plant from a frozen land, to show how species are dependent on each other as food sources. Interlink individual food chains into a food web. Consider what impact the removal of one of the components in the food chain or web would have. Find out about the biodiversity of the Arctic or Southern Ocean, using information books and other sources of information. Make a list of similarities and differences. Select a favourite sea creature to research further. Find facts, make drawings, label diagrams and keep notes about their favourite creature, creating a short information sheet about it for a classroom display.	Recall information about light from Year 3. Research how light travels and how we see. Draw a diagram to explain how light enters the eye and describe it using the scientific vocabulary. Describe reflection and how we are able to see objectives. Create their own investigation that proves light travels in a straight in. Investigate how light is reflected using mirrors and periscopes. Using a light intensity equipment, measure the reflected light intensity for different paper colours. Find the mean after 3 recordings. Ask their own questions about light and reflection and set up their own investigation, predict and present their findings.	Recall prior learning from Year 4. Eg. What components do you need in an electrical circuit? What is a conductor and an insulator? Look at a picture of an electrical circuit and describe if it will work or not and why. Create and scientifically draw a circuit using the correct symbols and use symbols to create a circuit. Investigate how voltage affects the brightness of the light or loudness of buzzers using a voltmeter. Children to ask their own questions about the electrical circuit and create their own comparative test.

Girlington Primary School Science Curriculum

Vocabulary	Circulatory system, blood vessel, artery, vein, cell, oxygen, nutrients, organs, disease, obesity	Evolution, Adapt/adaptation, Characteristics, Species, Generation, Identical, Inherit/inheritance, Vary/variation	Characteristics, Micro-organism Kingdom (animals, plants, fungi, bacteria, protists), Category, Phylum, Class, Order, Family, Genus, Species	Revise from Y3 – source, shadow, reflect, reflective, surface Ray, Absorb	Electric current, Positive, Negative, Volts, Symbol Revise: appliance, circuit, cell, wire, buzzer/motor, battery, switch, conductor, insulator
Scientific enquiry skills	• Observe, describe and compare in careful detail using the correct language. This includes Year 6's vocabulary and all the previous year group's vocabulary (see curriculum map). • Sort and classify with precise reasons • Make predictions based on scientific facts and ideas • Collect evidence/information/data to test out an idea/prediction or answer a question from a wide range of sources • Measure precisely in standard units • Select the most suitable equipment for the task • Plan ways to test out their own/someone else's ideas • Independently set up and carry out fair tests • Decide when to repeat observations and measurements • Choose the most appropriate way to record and present results • Interpret and predict from bar charts and line graphs • Explain observations/results using cause and effects and scientific facts and ideas • Explain what the evidence shows and whether it supports any predictions • Identify trends and patterns in data that do not fit and explain using scientific facts and ideas • Identify scientific evidence that has been used to support or refute ideas or arguments • Select the most appropriate way to communicate findings, evaluating the evidence as well as describing it • Evaluate their work and suggest ways to improve their work giving reasons				
Subsequent KS3 Learning	**Biology** Explain the functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts. Identify similarities between animal and plant cells. Recognise the role of diffusion in the movement of materials in and between cells. Identify structural adaptations of unicellular organisms. Outline the hierarchical organisation of multicellular organisms from cells to tissues to organs to systems to organisms. Describe the structure and function of the human skeleton including support, protection and movement. Describe the function of muscles and examples of antagonistic pairs of muscles. Identify the structure and function of the gas exchange system in humans including the mechanism of breathing. Identify and describe the structure and function of the male and female reproductive systems, the menstrual cycle, gametes and fertilisation including the effect of maternal lifestyle of the foetus through the placenta. Describe reproduction in plants including the structure of a flower, types of pollination, fertilisation, seed and fruit formation and dispersal	**Chemistry** Describe properties of the different states of matter in terms of the particle model including gas pressure. Use the particle model to explain changes of state. Describe a simple model of the atom. Identify differences between elements, atoms and compounds. Recognise and apply chemical symbols and formulae for elements and compounds. Explain the law of conservation of mass. Explain chemical reactions as the rearrangement of atoms. Identify reactions of acids with alkalis and metals including the products formed. Define acids and alkalis in terms of neutralisation reactions. Use the pH scale and indicators for measuring acidity and alkalinity	**Physics** Recognise forces as pushes or pulls arising from an interaction between two objects. Show the relationship between force and extension using Hooke's Law. Identify forces as contact and non-contact. Associate forces with stretching and squashing objects. Apply force arrows and diagrams to explain balanced and unbalanced forces. Recognise that sound needs a medium through which to travel and identify the difference of the speed of sound in solids, liquids and gases. Explain frequency measured in hertz, echoes, reflection and ultrasound. Discover the auditory range of humans and animals and recognise the danger to the eardrum of loud sounds. Explain the similarities and differences between light and sound waves. Explain the transmission of light through materials including absorption and reflection. Describe the law of reflection. Explain how and why we see objects as different colours. Identify our sun as a star and recognise that there are other stars in our galaxy and other galaxies. Explain the seasons in terms of the Earth's tilt. Explain how eclipses form and the stages of the moon.	
	Work scientifically by: 1) Analysing: presenting data, analysing patterns, drawing conclusions and discussing limitations 2) Communicating: constructing explanations, communicating ideas, critiquing claims, justifying opinions 3) Enquiring: devising questions, testing hypotheses, planning to control variables and collecting data 4) Solving: estimating risks, examining consequences, interrogating sources and understanding how scientific ideas change over time				