St. Michael's Science Overview 2022

Science In The EYFS

Children will explore Science through Understanding of The World. Throughout our continuous provision for the children, they will have opportunities to become scientists through observing the natural world around them. They will explore and actively show curiosity by being encouraged to question and find answers to our Big Questions as well as their own interests.

Through encouraging curiosity with our big questions, we are able to expose children to ideas and key vocabulary that will support progression into year 1 and contribute to the children's readiness for the Key Stage 1 Science Programme of study.

Each Term our Big Questions will spark children's interest to question and find answers. They will be able to record and share what they find out, communicating their ideas and suggestions.

To support our readiness, we will: -

- Use their senses to observe and look closely at the weather daily, discussing what we can see, feel and hear;
- Observe the seasonal changes throughout the year by going on seasonal walks and recording what we found out by taking pictures, drawing and discussing what we have noticed;
- Learn about different animals around the world, identifying and classifying them into groups by finding things that are similar and different;
- Explore different materials and use equipment to test them when building and making, identifying different properties and why we need to use different materials for different things;
- Grow different seeds and begin to understand how they grow, noticing changes and looking at different parts of plants and trees;
- Observe the life cycle of a butterfly;
- Use equipment to perform simple tests to encourage awe and wonder;
- Using their curiosity to explore their own bodies and senses;
- Learn about being healthy, including eating healthily and the importance of physical exercise;
- Develop a sense of curiosity and exploration through a range of resources such as sand and water, and start to ask questions.

Reception Overview

	Autumn		Spring		Summer	
Big Questions	What makes me Unique? What is a traditional tale?		How can I get there? What is my favourite animal and why?		What can I grow? Who can help me?	
Progression links in year 1	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
	Animals including humans – *ourselves* ***Seasonal weather***	*Everyday Materials* *Three Little Pigs – Traditional tales.* ***Seasonal weather***	Earth and space – Transport (air transport) ***Seasonal weather***	Living things and their habitats – *Animals* *Famous scientists (David Attenborough*	Plants – growth and change ***Seasonal weather*** Animals including humans – growth/ourselves	Inspirational scientists/ people - The NHS
Significant Individuals			David Attenborough			
Key Vocabulary in Reception	Scientist, science, observe, explore, investigate, identify, test, Head, shoulders, knees, toes, arms, legs, feet, eyes, nose, ears, mouth, hear, smell, taste, look, touch, material, recycle, wood, cardboard, plastic, glass, metal, rock, fabric, paper, shiny, hard, soft, rough, smooth, strong, weak, clear, waterproof, float, sink, melt, loud, quiet tree, trunk, branch, leaves, flowers, stem, petals, fruit, root, seeds, grow, sunlight, soil, plant, water, sun, autumn, spring, summer, winter, season, sun, moon, light, dark, temperature, sunny, cloudy, windy, wet, cold, hot, snow, frost, ice animal, habitat, caterpillar, butterfly, mini-beast, tadpole, froglet, frogspawn, egg, sea, ponds, farm, pet, zoo, wild, jungle, forest, desert, arctic, nocturnal, mammals, insects, birds, fish, carnivore, herbivore, prey, predator, natural, wildlife					

Y1		Autumn		Spring	Summer	
Working Scientifically		**During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking simple questions and recognising that they can be answered in different ways** • **observing closely, using simple equipment** • **performing simple tests** • **identifying and classifying** • **using their observations and ideas to suggest answers to questions** • **gathering and recording data to help in answering questions**				
Topic		Animals including humans – ourselves Seasonal weather	Animals including humans – Our pets Seasonal weather	Everyday Materials Seasonal weather	Scientists and Inventors Seasonal weather	Plants Seasonal weather
National Curriculum objectives		Pupils should be taught to: • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	Pupils should be taught to: • 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). • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	Pupils should be taught to: • 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. • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	Pupils should be taught to: • describe the simple physical properties of a variety of everyday materials; • identify and name a variety of common animals; • describe and compare the structure of a variety of common animals. • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.	Pupils should be taught to: • 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. • observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.

Whole unit	Expected outcomes	• To be able to observe changes over time; • To know how we change as we get older; • To be able to collect data, look for patterns and carry out; investigations. • To know there are 4 seasons in the UK.	• To be able to look carefully at the behaviour and habitats of creatures in the school grounds; • To know about a variety of common animals, particularly pets and to know how to keep them happy and healthy; • To understand that the days are shorter in winter.	• To identify and name everyday materials; • To describe simple properties of everyday materials; • To observe closely; • To sort objects 2 ways; • To be able to use simple equipment to observe and record the weather.	• To observe and describe 4 properties of plastic; • To identify common zoo Animals; • To sort animals into 3 groups based on their body parts; • To describe how vets look after common pets; • To know that there are more daylight hours in summer.	• To be able to say 3 things a plant needs to grow; • To plant a bean; • To find plants in the wild and identify them by a picture; • To say the names of parts of trees; To know how seasons change.
	Visits/trips/ workshops		School grounds			School grounds
	Vocab	***compare, describe, similar, different, baby, adult, changes, growing, patterns, measure, record, data, gather, predict, centimetre, millimetre, test***, ears, senses, hearing, touch, sight, smell, taste, hear, rain, snow, storm, thunder, lightning, cloudy, clothing, warm, cold, ***forecast***	notice, patterns, ***behaviour, habitat,*** mini-beast, living things, ***damp, shady,*** dry, ***vertebrate, backbone,*** happy, healthy, ***explore, investigate, observe,*** birds, fish, ***amphibians, reptiles, mammals, invertebrates, group, classify,*** compare, similarities, differences, rain, snow, storm, thunder, lightning, cloudy, clothing, warm, cold, forecast	material, glass, metal, ***fabric***, plastic, wood. ***rough/smooth, flat/bumpy, sharp/blunt, rock, properties***, ***magnetic, non-magnetic, rough/smooth, flat/bumpy***, rain, snow, storm, thunder, lightning, cloudy, clothing, warm, cold, forecast, water, ice, melts, frozen, observe, ***waterproof,*** bendy***/flexible***, ***absorbent,*** breaks/tears	Lego, material, plastic, properties, ***Ole Kirk Christiansen, astronaut, Mae Jemison***, space, ***NASA, Endeavour, Zoo, enclosure***, sort, group, wings, fur, fins, legs, ***Carl Hagenbeck, George Mottershead,*** animals, ***veterinarian, vet's,*** poorly, medicine, pet, tail, ***claws, wing, whiskers, fins,*** t***reatmen***t, rain, snow, storm, thunder, lightning, cloudy, clothing, warm, cold, forecast	garden, seeds, flower, plant, ***magnifying glass, roots,*** leaves, petals, ***tally chart, tally, wild, broad bean, deciduous, evergreen,*** leaf, veins, flower, stem, roots, seeds, bulb, rain, snow, storm, thunder, lightning, cloudy, clothing, warm, cold, forecast

Weekly learning objectives specific to St. Michael's (progression of skills) key questions							
		I know what I want to learn about myself and know about my senses. Why is it important to learn about ourselves? What kinds of things could we learn about? What do the different body parts do?	I can plan and carry out an observation. What is a habitat? What might you find in a rock pool? A burrow? What habitats did you find? What were they like? What were their features? Is there anything that is the same about all the mini-beasts found in one habitat?	I can identify different materials (maths). What is a material? What is x made of? What would the classroom be like if the tables were made of jelly? Or the chairs were chocolate? Why are certain materials used to make these items? How could we classify objects using hoops?	I can discuss properties of materials and know which materials would be good to fix an umbrella. What do umbrellas do? What sort of fabric is useful for an umbrella? What properties will it need? How can we test a fabric to see if it has those properties? Why have you chosen this? What will you do to see if it will work? What do you think will happen?	I can describe the properties of Lego and think why it is made out of plastic (literacy). What is Lego made out of? Is plastic the best material to make Lego out of? What adjectives describe Lego?	I can plant a bean and describe how to do it. What do plants need to grow? How are we going to look after them? What equipment do we need?
		I know how we change over time (PSHE, history). What features do babies have? Toddlers? Children? Adults? Older adults? What is the same? Different? How have I changed?	I can make predictions and explore, discuss and evaluate different materials. What can we clean up the dog's mess with? What will be the best material? Is it working as well as we hoped or expected? Is this what you predicted?	I understand about magnets and metals. What do you know about magnets? How many paperclips can you hold with a magnet? Do magnets attract to all materials?	I can test materials to fix an umbrella. How can we know that this material will not let the rain through? How can we test it? What can we use a pipette for? Why is it better than a jug? Are the droplets sitting on top or are they being absorbed? Is it wet or dry underneath?	I can ask questions and find answers (literacy). What do you find interesting about Mae Jemison? What would you like to ask her?	I can make a tally chart of wild plants and flowers (maths). Are our broad beans wild plants? Which wild plant/flower was most/least common?
		I can collect and record information about my body by observing and measuring. I can see patterns between foot and head size (maths). Why do we need to know the size of our hands and feet? Do people with bigger feet need larger gloves?	I understand differences between birds, fish, amphibians, reptiles, mammals and invertebrates and why some animals make good pets and others do not. Which creatures would make good pets? Why aren't some animals good at being pets? Are some dangerous? Do they need extra special care?	n sort objects ording to these criteria: d, soft, stretchy, stiff, ndy/floppy. nderstand how different terials are needed for erent objects. at makes it different n the other objects? Is re another object made m the same material to p it company? If rything I touched ame floppy, how would life be different?	Science competition	Bank Holiday	School trip

		I understand how we hear sounds. What things do we need to be able to hear? What things change how loudly we hear something?	I know how to keep a pet happy and healthy (PSHE). What do different pets need to keep happy and healthy?	Candlemas	I understand that water is a material and ice is water in a different state. What will the ice turn into when it melts? What was ice before it went into the freezer? What sort of things could we do to the ice to make it melt faster? Or how could we slow down the melting? What will happen if we put salt on it?	I know who invented the first zoo (history). I can describe and compare the structure of a variety of common animals, by sorting animals according to their features. What features does each animal have? Do you notice anything about the groups and the animals in them?	I can identify and sort evergreen and deciduous trees by their leaves. What trees do you think we have in the school grounds? What are deciduous trees? What are evergreen trees?
		I understand how to classify using our senses. Do you like green fruits? What else is crunchy? What does the skin feel like? What does it sound like when you tap it with your finger? Do any have bumpy skin? Does its smell remind you of anything else?	I know how to look after a reindeer (geography). How would we look after a reindeer? What is its environment? What does it need to be able to do? (fly)	I understand the best materials to build with (literacy). What are the Three Little Pigs' houses made of? Does it feel soft? Strong? Will it be good material for building a house? Will it blow down when the Wolf blows? Why will it blow down? What useful properties do the materials need to have, to be good materials for house building?	I can observe a block of ice and devise an investigation to melt it. What is ice? How can you turn water to ice? How can you turn ice to water? How can you speed up this process?	I know how vets look after animals. I can identify the different parts of animals. What does a vet do? What is wrong with this animal? What treatment does it need?	I can identify and describe the different parts of plants and trees. What are these parts of a plant called? What are these parts of a tree called? What is its function?
		I can use different senses to explore the world. What senses do we need to work out what the item is? What senses are we/are we not using? How many senses are we using at the same time?	I can observe and record the weather (geography) What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?	I can observe and record the weather (geography). What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?	I can observe and record the weather (geography). What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?	I can observe and record the weather (geography). What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?	I can observe and record the weather (geography). What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?

		I can make a sensory board or sensory bottle. How would the sensory board/bottle help younger children learn about their senses? Which materials can be used for each sense?	Nativity				
		I can observe and record the weather (geography) What season is it? What is the weather like? What do you predict the temperature is? How much rainfall will we have this week? How windy is it? How can we measure these things?					

Y2		Autumn 1		Spring 2	Summer 2	
Topic		Animals including humans – Growth and survival	Living things and their habitats – Habitats	Materials including famous scientists	Growing plants	Famous scientists
Working Scientifically		**During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking simple questions and recognising that they can be answered in different ways** • **observing closely, using simple equipment** • **performing simple tests** • **identifying and classifying** • **using their observations and ideas to suggest answers to questions** • **gathering and recording data to help in answering questions**				
National Curriculum objectives		Pupils should be taught to: • 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	Pupils should be taught to: • 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 • 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	Pupils should be taught to: • 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 • Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam. • Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or **John McAdam**	Pupils should be taught to: • 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	Pupils should be taught to: • Pupils might find out about people who have developed useful new materials, for example John Dunlop, Charles Macintosh or John McAdam.

Whole unit	Expected outcomes	• To say which animal some babies will grow into; • To name some animal babies; • To say the three things that humans need, to stay alive; • To generate questions about a pet they have chosen; • To give examples of healthy and less healthy food; • To name some things that humans do to keep themselves clean; • To use a magnifying glass or microscope to look closely at their hands; • To attempt to record what they see.	• To say what is different about things that are living, dead or have never been alive; • To identify some of the plants and animals in a familiar habitat; • To sort objects into categories; • To find microhabitats. • Describe the conditions in a habitat; • To ask questions about different habitats; • To describe the characteristics of some plants and animals; • To name some sources of food.	• To identify and name everyday materials; • To identify different uses of everyday materials; • To record their observations; • To demonstrate and explain how shapes of objects made from some materials can be changed; • To explain what recycling means.	• To look closely at plants and trees; • To record what they see by drawing or Writing; • To follow instructions to plant a seed and a Bulb; • To order the life cycle of a plant; • To suggest how to care for a plant so it grows Well; • To give examples of food crops; • To explain that plants are living things.	• To describe things plants need; • To construct a mini greenhouse with a partner; • To observe how plants grow; • To discuss whether doctors are scientists; • To describe when and why we should wash our hands; • To take part in an activity to show how germs spread; • To give a minimum of two facts about Charles Macintosh; • To identify Charles Macintosh's famous invention; • To give facts about Rachel Carson; • To take part in an investigation to prove what Rachel Carson found out about water pollution; • To answer questions about where our energy comes from.
	Visits/trips/ workshops	Whipsnade Zoo (summer term)	School grounds	Classroom and school – this could include the local area. Set Point science week competition paper structures	School grounds	Whipsnade Zoo

	Vocab	mammals, birds, reptiles, amphibians, ***womb***, egg, spawn, pregnancy, ***life cycle,*** chick, ***hatchling***, tadpole, adult, baby, toddler, child, teenager, adult, elderly, ***comparative test***, ***basic needs***, survive, water, food, air, lungs, ***gills***, shelter, ***food groups***, exercise, physical activity, heart, muscles, ***calories***, clean, ***hygiene***, germs, measure height record, ***data***, growth, ***fair test***	***life process***, living, non-living, dead, never alive, movement, ***respiration***, ***sensitivity***, growth, ***reproduction, excretion***, ***nutrition***, ***habitat***, ***conditions,*** survive***, urban***, woodland, pond, coast, coastal, Minibeast, microhabitat, enquiry, ***survey*** pictogram, research, ***conditions***, ocean, tropical rainforest, arctic, desert, ***adaptation***, ***adapt, adaptation***, depend, ***dependency***, ***food chain***, ***consumer, producer, predator, prey, herbivore, carnivore, omnivore***, insect, woodlice, worm beetle, spider, dark,damp	Identify, materials, wood, plastic, glass, metal, rock, brick, paper, cardboard, uses, used, ***properties***, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not bendy, absorbent, not absorbent, waterproof, not waterproof, ***transparent, opaque***, observations, record, ***classify***, group, similar, safe, unusual, compare, ***suitability***, suitable, unsuitable, purpose, change, squashing, bending, twisting, stretching, squash, bend, twist, stretch, recycle, recycling, reuse, ***biodegradable***, ***environment***, landfill site, ***recycling depot***, shredded, melted, pellets, ***raw materials***, ***greenhouse gases***, invent, ***macadamisation, macadam road***, ***patent***, Parliament, compensated, royalties, knighthood, ***tar***, t***armacadam***, tarmac, fair test measure record,	roots, stem, leaves, flower, trunk, branches, ***observation***, diagram, seed, bulb, ***germinate***, ***embryo***, stem, tunic, scales, bud, sprout, compare, comparative test, life cycle, ***life process***, sprout, seedling prediction, grow, table, bar chart, ***germination***, water light	greenhouse, light, water, temperature, plant, ***horticulturist, biome, Eden Project***, tall, ruler, shoot. ***botanist, Jane Colden***, plant, leaf, flower, stem, observe, illustrate, sketch, doctor, science, ***Elizabeth Garrett Anderson***, surgery, healthy, exercise, diet, hygiene, clean, ***Louis Pasteur***, germs, handwashing, spread, disease, illness, ***Charles Macintosh***, waterproof, raincoat, properties, fabric, ***Rachel Carson***, ocean, habitat, food chain, chemicals, ***pesticide***, pollution.

Weekly learning objectives specific to St. Michael' s (progression of skills), key questions		To notice that animals, including humans, have offspring which grow into adults, by describing the changes to animals as they grow. To identify and classify, by matching animals with their babies. Do you know what these baby mammals are called? Do you know what these baby birds are called? Which kinds of birds will these babies grow up to be? These are baby amphibians. Do you know what they are called? What do you think they will grow up to be? These are baby reptiles. Do you know what they are called?	To explore and compare the differences between things that are living, dead, and things that have never been alive by thinking about life processes. To use their observations and ideas to suggest answers to questions by explaining how they know something is living, dead or has never been alive. What do we do that lets us know we are alive? Which of these are living? Which are non-living? How can you tell? All of these things are non-living, which living thing were they part of? Is this teapot living, dead or has it never been alive? How can you tell? Is this rabbit living, dead or has it never been alive? How can you tell? Is this pinecone living, dead or has it never been alive? How can you tell?	To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses by identifying the uses of different materials. (cross curricular art) How many everyday materials can you name and what were the materials used for? (Y1) Can you remember anything about them? - What did they look like? - What did they feel like? - How did they behave? (Y1) Can you remember doing any investigations? (Y1) What did you find out and what did you learn? (Y1) Look at the materials in these photos. What might they be used for? Have a look around the classroom. Can you see any familiar objects which are made from these materials?	To observe closely using simple equipment by recording observations of a variety of plants in the local environment. Here are some common plants that grow wild. Do you know what any of them are called? Here are some common plants that grow wild. Do you know what any of them are called? What do you know about the parts of plants? What do you know about the parts of trees? What interesting plants and trees did you find?	To find out how plants need water, light and a suitable temperature to grow and stay healthy in the context of exploring how plants grow in greenhouses, including in the biomes at the Eden Project. To find out how plants need water, light and a suitable temperature to grow and stay healthy in the context of comparing plant growth in and out of a greenhouse. (Y3) What is a greenhouse? Why do you think people grow plants in them? Do you think all plants grow well in greenhouses?

		To notice that animals, including humans, have offspring which grow into adults, by learning about how humans grow and change. To perform simple tests, by testing if children get faster as they get older. Can you think of a way that you have changed as you have got older? What are the stages of life that human beings go through? What do grown-ups need to do to take care of a baby? How do grown-ups take care of toddlers? What changes are happening to you at the moment? How can you tell someone is a teenager? Who are the adults in your family? How are they different to you? How are elderly people different from young adults? Do children get faster as they grow older? How could we investigate the answer to this question? How would we know if we have done it? Can we collect any information to help us find out? Which children completed the activity in the shortest time? What did you find out? Were the results what you expected? Do we have enough information to answer the question? What other information could we collect?	To identify and name a variety of plants and animals in their habitats, by mapping a habitat and identifying its inhabitants. To identify and classify, and sort objects into categories, by sorting objects that are living, dead and have never been alive. What do these words mean (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition)? What is your habitat? Where do you live? What living things live and grow there? How does your habitat keep you safe and sheltered? How does your habitat provide food and water? How does your habitat provide space for you to move and grow? How do humans change their habitats? Do you remember learning about the 7 life processes? What can you see that is living, dead and that has never been alive? Compare your Local Habitat Maps with the other people in your group. (cross curricular link geography) Do they contain the same features? Are there any differences? Do they contain the same living and non-living things?	To identify and classify the uses of everyday materials in the context of the local area. To gather and record data to help in answering questions by recording observations. What must we remember to do to keep ourselves safe? (cross curricular PSHE) What different uses of materials did you find? Is there any way we can group some similar uses together? Did you spot any unusual uses of materials? Why do you think that material was chosen for that purpose?	To observe and describe how seeds and bulbs grow into mature plants by planting seeds and bulbs. To perform simple tests by setting up a comparative test to understand what plants need to germinate and grow. What do plants need to grow? How can we find out if you are right? How can we find out if you are right? Which seed did we predict would grow the best? What conditions should we give our sunflower and Abyssinian gladiolus plants so that they grow well?	To identify and describe the basic structure of common flowering plants by observing and sketching a range of common plants. To observe closely using simple equipment by using a magnifying glass to sketch details of different plants. Look at this picture of one of her drawings. What different parts of a plant can you spot? Why is it difficult to look at the plants' roots? Can you tell your partner what a botanist does? Can you tell your partner what a botanist does?

		To find out about and describe the basic needs of animals, including humans, for survival (water, food and air), by identifying the ways that different animals meet their basic needs. To ask simple questions and recognise that they can be answered in different ways, by generating questions about a favourite pet and researching answers. Do you need these things to keep you alive? There are only a few things that we really need. Do you know what they are? Can you think of anything else these animals might need? What about other animals in our care?	To identify and name a variety of plants and animals in their habitats, including microhabitats by identifying minibeasts in microhabitats. To gather and record data to help in answering questions by investigating the preferred habitat of minibeasts. What microhabitats did we find in our local habitat? Did you see any of these minibeasts in the local habitat? Did you see any of these minibeasts in the local habitat? Do all minibeasts like living in the same microhabitats? How could we answer this question? Can you see any microhabitats (in the maps you made)? What were your two microhabitats like? Did your two habitats have different kinds of minibeasts? Can you suggest why?	To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses by exploring the purposes of different objects. Why are window panes made from glass? What is it about glass that makes it a good material for window panes? Why wouldn't other materials be as suitable? Which material do you think is best to make a ruler from? Why? When might a plastic ruler be more suitable? When might a wooden ruler be more suitable? When might a metal ruler be more suitable? What material are spoons made from and why? Why do you think spoons are made from different materials? When would the spoons made from the different materials be used? Who would use them and why? Which spoon would you give a toddler to eat their dinner with? Why? Which spoon would you use to make a cake with? Why? Which spoon would you use to eat soup with? Why? Which material do you think would be the most suitable material for making coat hangers from and why?	To observe and describe how seeds and bulbs grow into mature plants by understanding the life cycle of plants. To use their observations and ideas to suggest answers to questions by giving ways we can tell that plants are living things. Has your plant started to grow? How can we tell that plants are living things? How do humans and other animals reproduce? (compare this to a bean lifecycle).	To use their observations and ideas to suggest answers to questions in the context of considering whether doctors are scientists. To describe the importance for humans of exercise, of eating the right amounts of different types of food, and hygiene in the context of creating a poster for a doctor's surgery to explain how to stay healthy. Do you think doctors are scientists? In the clip, you heard about Elizabeth Garrett Anderson. What was special about her?

		To describe the importance for humans of eating the right amounts of different types of food, by exploring food groups. Using their observations and ideas to suggest answers to questions, by suggesting improvements to their diet and designing their own healthy meals. Can you match the food to the animal that eats it? What do humans need to eat? What good eating habits can you see in this Healthy Eating Journal? How could we improve this diet to make it healthier?	To 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, by researching habitats and the animals that live in them. To ask simple questions and recognise that they can be answered in different ways by asking and answering questions about a range of different habitats. Do you remember how plants and animals rely on the environment around them to provide them with everything they need? How can we find more information? How can we find more information? What is the weather like? What plants and animals live there? What do they eat? Where do they live? How do they survive? Would a shark survive in the rainforest? Would a polar bear survive in the desert? Would a spider monkey survive in the ocean? Would a camel survive in the arctic?	To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching by changing the shape of objects. How can we change the shape of objects made from some materials? Can you think of an example of when you have changed the shape of something? What was it and how did you change it? Which materials do you think would be easy to change the shape of? Why? Which materials do you think would be more difficult to change the shape of and why? Can you twist a ruler? Can you squash a ruler? Can you stretch a pencil? Can you bend a pencil?	To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy by comparing the growth of seedlings under different conditions. To gather and record data to help in answering questions by measuring the results of a comparative test. Do you remember when we planted some seeds for our comparative test? What conditions have we given our plants? What have we found out about what plants need to grow well? Were our predictions correct? Did we choose the right conditions for our seeds and bulbs to make sure they grow up healthy and strong? We know that plants need light and water to grow, but what about the temperature? Do you think a plant will grow better in the warm or in the cold? How can we find out?	To describe the importance of hygiene to humans in the context of investigating Louis Pasteur's work on how germs spread. To use their observations and ideas to answer simple question in the context of investigating how germs spread and the effect of hand washing. When do we wash our hands? Why should we wash our hands? Did any of you talk about germs? What did you notice about how germs spread? Can you design a handwashing hero to help people wash their hands? What happened to the glitter germs throughout the lesson? What does this tell you about how germs spread? Why is it important to wash your hands well?

		To describe the importance for humans of exercise, by finding out why humans need to exercise. To gather and record data to help in answering questions, by recording the ways that exercise affects the body. Why is exercise important? (cross curricular PE) What kind of exercise do you enjoy? What kinds of exercise would you like to learn? Do you exercise every day? Can you think of three activities that count towards your 60 minutes a day?	To identify how an animal is suited to its habitat. To explain how living things in a habitat depend on each other. What are ocean habitats like? Can you remember some plants or animals that live here? What is the Arctic habitat like? Can you remember some plants or animals that live here? What are tropical rainforest habitats like? Can you remember some plants or animals that live here? (Y4) What are desert habitats like? Can you remember some plants or animals that live here? Why does an oak tree need a squirrel? Why do foxes need squirrels? Why do foxes need oak trees? How do humans depend on other living things to stay alive? What living things depend on us for survival?	To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching in the context of recycling. What is recycling? What does recycling mean? How can you recycle? Do you recycle at home? How? Do you recycle at school? How? What do you think happens to the materials we recycle? Is it important to recycle? Why or why not? What can be recycled? How do you recycle at home? How do you recycle at school?	To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy by explaining what conditions plants need to grow well. To use observations and ideas to suggest answers to questions by using the results of tests to suggest good conditions for growing plants for food. Do you remember we planted some cress? Which one do you think has grown the best? Why? What other things do they (plants) need? How do we know? Lots of the food that we eat is a part of a plant. Can you think of any? Shall we try some of the food we have talking about? What part of plants do these foods come from? How do you think farmers hep them grow?	To find out about people who have developed new materials in the context of learning about Charles Macintosh. To identify and compare the suitability of a variety of everyday materials for particular uses in the context of testing materials to find the most suitable material for a waterproof coat. Which of these items would you use or wear in the rain? What do they have in common? What are the other things you tested made from?

		To describe the importance for humans of hygiene, by learning about good hygiene habits. To observe closely, using simple equipment, by using hand lenses to observe their hands and drawing what they see. (cross curricular PSHE) What things do humans do to keep themselves clean? Why is it important that we do these things to keep clean? When do we need to wash our hands?	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 by making a variety of food chains. How do animals get their food? Can you think of some herbivores? Can you think of some of the different things they could eat? Can you think of some carnivores? Can you think of some of the different things they could eat? Can you think of some omnivores? Can you think of some of the different things they could eat? Are humans' herbivores, carnivores or omnivores? What do we eat? What is a food chain?	To find out about people who have developed useful new materials by learning about John McAdam. Can you match the correct person with the new process or material they invented?	To observe and describe how seeds and bulbs grow into mature plants by comparing the growth of seeds and bulbs. To observe closely, using simple equipment by measuring and recording the growth of seeds and bulbs. We planted a dwarf sunflower and a paperwhite narcissus. One was a seed; one was a bulb. Can you remember which was which? What happens to a plant when it is left in the dark? What happens to a plant when it is left in the dark? Which three things does a plant need to grow well? Which word describes what happens when a seed starts to grow? The more warmth a plant has, the more it will grow: is this statement true or false? Why does grass grow more quickly in summer than in winter?	To describe how animals, obtain their food from plants and other animals, using the idea of a simple food chain in the context of exploring Rachel Carson's study of the ocean. To observe closely, using simple equipment in the context of investigating the effects of pesticides in water, as researched by Rachel Carson. Can you order the ocean animals to show their food chain? What do you notice about this water sample? You have collected three water samples. What do you notice about each one? What does this show about how chemicals can get into the ocean? Why do you think it is important to protect the world's oceans and keep them clean?

		To identify what to measure to answer a question. To Record measurements to find out if the older children in year 2 are taller. (cross curricular maths) What happens as we get older? Will the older children in the class will be taller? Are the older children in year 2 taller? What will you measure? How will you find that out? What will you write down? How can you record that? How can you show someone else what you have found out?	To predict where animals might be found. To gather and record data about where animals are found. To comment on whether the results are what was expected. (cross curricular maths) What is a habitat? Can you describe some features of habitats and what might live there? What different microhabitats do we have in the school environment? What are they like? What do think we might see when we look in the bushes/ under logs etc.? What animals do you think might live there Why? How will you record what you find there? Did you find what you expected to? If we went again, would you expect to find the same results?	To gather and record data to help find out which material is most waterproof. (cross curricular maths) What coat material will help keep a teddy bear dry? What materials do you know and how good they would be? How can you carry out an investigation to see which material would be best at keeping something dry? Is this fair? Why not? How can we make it fair? What will you keep the same? What will you measure? How do you know which material is best at keeping things dry?	To carefully observe the changes that happen as a seed starts to grow. To describe what a seed needs to grow. (cross curricular maths) What do you think a seed needs to start growing (germinate)? what might happen? When they you check the seeds. How will you record any changes? What does this seed need to germinate? What do you think will happen first? How can you record what you see? Will the plants continue to grow where they are? What do you think the seeds needed to grow?	

Y3		Autumn		Spring		Summer
Topic		Materials - Rocks and Soils	Forces and Magnets	Animals including humans – Healthy Eating	Plants	Light
Working Scientifically		**During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking relevant questions and using different types of scientific enquiries to answer them** • **setting up simple practical enquiries, comparative and fair tests** • **making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** • **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** • **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** • **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** • **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** • **identifying differences, similarities or changes related to simple scientific ideas and processes** • **using straightforward scientific evidence to answer questions or to support their findings.**			

National Curriculum objectives		Pupils should be taught to: • 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.	Pupils should be taught to: • compare how things move on different surfaces; • notice that some forces need contact between 2 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 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	Pupils should be taught to: • 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.	Pupils should be taught to: • 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.	Pupils should be taught to: • 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.

Whole unit	Expected outcomes	• To classify Rocks from the evidence of investigations; • To explain that Rocks are used for different purposes dependent on their physical properties; • To explain that different rocks react differently to physical forces; • To recognise that soil contains dead plants and animals.	• To describe how to make a familiar object start moving by pushing or pulling; • To describe how to use pushes and pulls to make familiar objects speed up, slow down, change direction or shape; • To produce annotated drawings showing the direction of force needed to make an object move; • To describe some ways in which friction between solid surfaces can be increased or decreased; • To describe the difference between magnet and magnetic material; • To recall that magnets have a north and south pole.	• To name the components of a healthy and varied diet; • To describe how their diet is balanced; • To describe some characteristics of bones; • To describe the main functions of a skeleton; • To state that movement depends on both muscles and skeleton; • To describe advantages of having an internal skeleton over no skeleton.	• To describe why healthy roots and a healthy stem are needed for plants to grow; • To know that fertilisers contain minerals; • To understand that plants absorb minerals from the soil; • To describe how the Stem has a role in support and nutrition; • To describe why plants need flowers; • To describe the role of Bees and Insects in pollination; • To describe how pollen and seeds are dispersed.	• To be able to describe and compare light sources; • To state that light sources are seen when light from them enters the eye; • To explain that places are dark because this is no light; • To identify suitable reflective surfaces; • To explain that shadows are similar in shape to the objects forming them; • To explain shadows are formed when light is blocked; • To describe how the length of a shadow changes throughout the day as the sun moves across the sky.
	Visits/trips/ workshops				Extracting DNA from strawberries – parent scientist workshop.	

	Vocab	***Sedimentary, Igneous, Metamorphic, form, formation,*** volcano, seabed, natural, ***human-made, compression, properties, permeable, buoyance, durability, coprolite, fossilisation, palaeontologist, transformations, translocations,*** soil, ***sub-soil,***	Push, Pull, ***Gravity,*** Force, Magnet, ***North Pole, South Pole, Attract, Repel, Friction, Magnetic Field,*** Strength, Compass	Survival, protection, shelter, exercise, movement, nutrition, balanced diet, ***digest, carbohydrates, proteins, fat, fibre, dairy***, water, ***vitamins, minerals***, fruits, vegetables, meat, skeleton, bones, protect, support, move, muscles, ***joints,*** ribs, heart, skull, brain, spine, collarbone, ***humerus, ulna, tibia, fibula, hand bones, phalange, mandible, carpals, hips, metatarsals, sternum, invertebrate, vertebrate, endoskeleton, exoskeleton, hydrostatic skeleton, bone marrow, calcium***	Roots, Stem, Flower, Leaves, Trunk, anchor, nutrients, ***transportation***, seeds, ***carbon dioxide,*** sunlight, absorb, air, light, water, soil, ***evaporate,*** temperature, petals, sepal, stamen, ***anther, filament, stigma, style, ovary, ovule, pollen tube, pollen, pollination, fertilisation, dispersal,*** germination, life cycle, stages, formation, seedling, reproduce	Light, dark, reflect, see***, illuminate***, visible, reflective material, mirror, rough, smooth, shiny, rays, scatter, reverse, beam, sun***, beneficial***, dangerous, glare, bright, damage, ***UV Light, UV Rating, Visible Spectrum, pupil, retina,*** protect, direct, sunglasses, hat, brim, energy, beam, travel, straight, ***opaque, translucent, transparent***, block, shadow
Weekly learning objectives specific to St. Michael' s (progression of skills) key questions		To observe, group and describe different rocks. What are rocks? How do rocks form? What rocks are natural? What rocks are man-made?	To identify the forces acting on objects. What is a force? How can we identify a force on an object?	To identify what Humans need to survive. Why do living things need food? What is vital for survival?	To identify the different parts of a plant. What are different part of a plant and their functions? (Art – Plants and Georgia O'Keffee)	To recognise that we need light to be able to see. What is light? What is dark? How does light allow us to see?
		To discover how different types of rocks are formed. What are the three types of rocks? How are they formed?	To compare how objects move on different surfaces. How do the different surfaces effect an object's movements? What is friction? What surfaces create a lot of friction? What surfaces create only a small amount of friction (Maths – Measurement/Length)	To classify food and understand a balanced diet. What is the difference between food groups and types of nutrition? What kind of foods do humans eat? What do nutrients do for us?	To explore the requirements plants need to grow. What do plants need to grow well? How can we investigate?	To investigate which surfaces reflect light. What does it look like if material reflects light? What colours reflect the most light? What are reflective materials used for?

		To compare and group rocks based on their properties. What are the properties of rocks? How can we test these properties? (Cross Curricular Link – Stone Age Weapons)	To sort magnetic and non-magnetic materials. What is a magnet? What is a magnetic field? What materials are magnetic?	To design a balanced diet for an adventurer. What makes a balanced diet? What are vitamins, minerals and fibres?	To investigate water transportation. Why is the Stem so important? How does water travel around a plant?	To investigate mirrors. What happens to light when it hits a mirror? Why are mirrors good reflectors?
		To research the life of Mary Anning. Who is Mary Anning? What is a palaeontologist? Why is this job important? (Computing – Stop Motion Videos)	To investigate the strength of magnets. How can we investigate the strength of a magnet? Do different shapes and sizes of magnets have different strengths	To identify the three functions of the skeleton. What are the bones protecting? How does the skeleton help us move? What do the bones produce for our bodies?	To name the different parts of a flower. What is a flower? What is its job? What are all the different parts and their jobs?	To understand that light that comes from the Sun is harmful. What are the benefits to sun? What are the dangers? What colours make up UV light? What parts of the eye can be damaged? (Geography – Weather) (National Sun Awareness Week)
		To investigate how fossils are formed. What is the difference between bones and fossils? What is the fossilisation process?	To explore magnetic poles. What are magnetic poles? Why do they attract or repel each other?	To explore the similarities and differences between skeletons. What is the difference between vertebrates and invertebrates? What are the different types of skeleton?	To explain the role of pollination and fertilisation. What is the process of pollination and fertilisation?	To explore how shadows are formed. How does light travel? How are shadows created? Can you think of materials which are opaque, translucent and transparent? (English – Shadow Puppet Theatres to recreate an alternative fairy tale)
		To understand that soils are made from rocks and organic matter. What is soil? What is soil made of? How many layers are there to soil?	To design a game using magnetic materials. Which magnetic materials will you use? How strong does the magnet need to be?	To identify different muscles in the body and what they do. What are muscles? What are they composed of? How do muscles help us move? Why do we need them to move?	To research the life cycle of a plant. How many stages are there in the life cycle? How are seeds dispersed?	To find patterns in the way that shadows change throughout the day. How do shadows change? How does the sun change a shadows pattern?

Y4		Autumn		Spring		Summer	
Topic		Materials States of Matter	Electricity **(Cross-curricular link – D&T light up Christmas cards).**	Sound	Animals including humans Digestive system	Living things and their habitats - Classification	Living things and their habitats – Adaptation **(Cross-curricular link – Geography Rainforests).**
Working Scientifically		**During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **asking relevant questions and using different types of scientific enquiries to answer them** • **setting up simple practical enquiries, comparative and fair tests** • **making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** • **gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** • **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** • **reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** • **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** • **identifying differences, similarities or changes related to simple scientific ideas and processes** • **using straightforward scientific evidence to answer questions or to support their findings.**				

National Curriculum objectives		Pupils should be taught to: • 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** **(Cross curricular link – Geography Volcanoes and Rainforests).**	Pupils should be taught to: • 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.**	Pupils should be taught to: • 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.	Pupils should be taught to: • 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.	Pupils should be taught to: • 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; • select, use and combine a variety of software (including internet services) that can accomplish given goals, including collecting, analysing, evaluating and presenting data **(Computing cross curricular objective).**	Pupils should be taught to: • identify features of animals and plants, which make them suited to their habitat; • recognise that environments can change and that this can sometimes pose dangers to living things; • recognise that changes to an environment can be dangerous to living things and to begin to understand what can be done to reverse some of the changes. **(Cross curricular link – Geography Rainforests).**

Whole unit	Expected outcomes	• Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool; gases escape from an unsealed container). **(Cross-curricular link – Geography Volcanoes).** • Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled. **(Cross-curricular link – Geography Rainforests).**	• Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. **(Cross-curricular link – D&T light up Christmas cards).** • Pupils should draw the circuits pictorially as well as diagrams; • Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.	• Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways; • Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses; • They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.	• Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions; • Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after them; • They might draw and discuss their ideas about the digestive system and compare them with models or images.	• Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat; • They should identify how the habitat changes throughout the year; • Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants; • Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.	• Pupils should be able to describe how animals local and rainforest habitats are suited to the conditions; • Pupils could explore what the impact of some local environmental changes are, both positive and negative; • They should look at the potential impact of deforestation in the rainforest regions of the world; • Pupils should understand what they can do to help minimise the impact of climate change. **(Cross-curricular link – Geography Rainforests).**
	Visits/trips/ workshops			PHC sound workshop morning		Fieldwork using school grounds. Link with Geography field trip to London Zoo Rainforest Experience to study habitats and animal adaptation.	

	Vocab	**State**, solid, liquid, gas, **change of state**, **water cycle, condense, condensation, evaporate, evaporation**, melt, melting, freeze, freezing, **solidify, solidification**, boiling, temperature, water, ice, **vapour , steam, reverse, reversible conditions**, cool, heat, invisible	Battery**, circuit, component,** bulb, electricity, **device**, buzzer, **current**, matched, motor, wires, **break, switch**, complete, brightness, **electrical conductor, electrical insulator**, metal, non-metal, plastic, **voltage**, plug, **volts, series circuit, parallel circuit**	Sound, noise, produced, quiet, soft, loud, harsh, volume, loudness, **pitch**, high, low, **vibration, vibrating, muffle, tuning,** length, thickness, tension, travel, material, **medium**, solid, liquid, gas, instrument, object	human **digestive system** mouth tongue- mixes, **moistens, saliva** teeth: **incisors-** cutting, slicing **canines**- ripping, tearing **molars**- chewing, grinding **oesophagus** transports **stomach acid** enzymes small intestine large intestine carnivore herbivore omnivore brush floss food chain sun **producers prey predators**	alive, dead, never been alive, movement, **reproduction, sensitivity, nutrition, excretion, respiration,** growth, habitat, living thing, animal, insect, local, **natural, man-made, observation, record, vertebrate, invertebrate, arachnid**, question, **classify**, sort, group, similar, different, **branching database**, explore, key, identify, teach	suited, plant food, produces, identify**, life processes**, habitats, **interdependence & adaptation**, plant growth, **fertiliser, producer, predator, prey, food chain, nutrients, consumer, key**
		States of Matter	Electricity	Sound	Animals including humans – The Digestive System	Living things and their habitats - Classification	Living things and their habitats - Adaptation
Weekly learning objectives specific to St. Michael' s (progression of skills) key questions		To understand that materials can be classified into different states and begin to use simple practical enquiries and scientific evidence to support their findings Can pupils discuss and explore the properties that make a material a solid, liquid or gas? Can they apply this knowledge to classify different materials?	To explore electrical games and resources, identifying what they know and what they need to know about electricity. What do pupils already know about electricity? Do they understand that electrical items in our homes are powered from mains electricity or batteries and can they identify some of these appliances and devices?	To ask and answer questions about the sounds that can be heard and to begin to consider how sounds are made. Can pupils predict which areas of the school will be quiet, which will be loud and which will have no sound at all? Can the children identify any other factors influencing the volume of sounds around the school site? Do they understand the term 'noise pollution'?	To use straightforward evidence to answer questions about the functions of human teeth. Can pupils discuss what they know about how to keep our teeth healthy? Do they understand why our teeth are different shapes and that they have different functions? Can they compare the teeth of a herbivore and a carnivore and consider why they are different?	To understand the characteristics of a living thing and to begin to consider that living things can be grouped in a variety of ways. Do the children understand the 7 characteristics of a living thing? Can they discuss which living things they would expect to find in their local environment and which living things they would definitely not find locally, and why? Do they understand that living things can be grouped in a variety of ways?	To determine various ways that an animal could adapt to a specific habitat i) local ii)rainforest Do the children understand the difference between physical and behavioural adaptations? Do they recognise that species adaptations match the landforms and climate of the habitat? **(Cross curricular link – Geography Rainforests).**

		To answer questions about gas using evidence from scientific enquiries and to record findings using drawings To explain to others, the evidence for gases and to describe how gases move Can pupils ask and begin to answer questions about the evidence of gases around us? Do they use their practical enquires and scientific evidence to demonstrate to others the evidence for gases?	To identify the dangers associated with electricity in the home and begin to recognise that the dangers are often associated with materials that are good conductors. To design and make an electrical safety poster, carefully considering the language used. Do children understand the dangers of electricity? Can pupils create safety posters to highlight the dangers to others? Do they understand that electrical dangers are often associated with materials that are good conductors?	To explain that sounds are made when an object vibrates and to begin to understand that we hear sounds when the vibrations travel from a source through a medium to our ears. To use this knowledge to recognise why sounds get fainter when you are further from the source of the sound. Can children explain that there are many kinds of sound and that there are many ways of making sound? Do pupils understand that sound is made through vibrations from a source? Are pupils able to devise experiments to research how sound travels? Do pupils know that sound travels through different mediums, including air, water and solids? Can they recognise that sounds get fainter as the distance from the sound source increases?	To use a simple practical enquiry to answer questions about the basic parts of the digestive system. Can they think about what they know about our digestive systems, and consider what they want to know? Do they know the basic parts of the digestive system? Can they explain the simple functions of the basic parts of the digestive system?	To ask questions about the local habitats and to carefully observe and record the living things in the local area. Can pupils ask questions about local habitats and consider how to answer them? Do the children carefully observe the micro-habitats they can see around them? Can pupils select a method to record different living things they can see ?(animals and plants)	To consider some of the natural changes that could happen to an environment and to understand what some living things can do to survive such changes. Do pupils understand how species adapt to natural changes such as tides and seasons? Do they understand whether changes are natural or man-made? Can they design a living thing that could withstand a huge range of changes to their environment?

		To understand, through practical tasks, that materials change state when they are heated or cooled and to describe this process using scientific language. To read the temperature from a thermometer, including those below zero. Can pupils accurately use a thermometer? Do they use scientific language to describe to another what happens to the particles when a substance changes state? Do pupils understand that liquids have a solidifying point (to become solid) and a boiling point (to change to gas)?	To construct a simple circuit, identifying the basic parts and to label a diagram of the circuit. To predict if different 'circuit' layouts will light a bulb, and then test their predictions. Can pupils identify electrical materials and components required for a buzzer to sound or a bulb to light? Can they create their own series of enquiries that explore electrical circuits and various effects? Can the children identify what the symbols represent on a circuit diagram?	To notice patterns between the pitch and volume of a sound and the features of the object that produced it. To use understanding of pitch and volume to answer questions about soundwaves. To begin to understand that sounds can vary by pitch and volume, and to explore how to change the sound that an instrument can produce. Do children understand that sound is a form of energy and will know that the more energy that is put into creating a sound, the louder the sound that is made? Can pupils look for patterns between the pitch of a sound and features of the object that produced it? Do the children see a pattern between the pitch and volume of a sound and the shape of the wave it produces?	To answer questions about what different parts of the digestive system do. To use physical movements to demonstrate an understanding of the digestive system. Do they know the basic parts of the digestive system? Can they explain what our digestive system might or might not do when we are unwell? Did they demonstrate an understanding of the functions of each part of the digestive system?	To observe features of living things and sort them into different groups. To use a computer program to create a branching database. Do pupils understand why it is useful to classify living things? Can they answer questions about the features of insects, arachnids and plants found in the local area? Can they use ICT or a sorting method to create a branching database/ dichotomous key to sort and identify local invertebrates? Do they understand why it is important to make accurate observations when describing features of living things?	To begin to consider how the rainforest environment has changed and why these changes may have happened. To discuss the positives and negatives of changes to the natural environment. Can the pupils understand why indigenous and regional groups would want to change this environment? Do they see how changes have caused plants and creatures to adapt, or become endangered? Are they able to suggest solutions to this problem?

		To ask a question about evaporation and set up a practical enquiry that will provide the scientific evidence to answer it. Can pupils identify the main elements of the water cycle? Do they use scientific language and annotated diagrams to explain evaporation and condensation to others? Can they suggest factors that speed up evaporation?	To open and close a circuit with a switch and to predict and test which other materials could be used to conduct electricity. To record findings and draw conclusions about materials used to make electrical circuits, and materials used to keep us safe from electrical circuits. Can pupils introduce a switch to their circuit and understand that a break in the circuit will stop the flow of electricity? Are they able to predict and explain which materials are good conductors of electricity, and which are not?	To use what they know about the world to ask and answer questions about the hearing of humans and other animals. To understand that sound travels slower than light. Can the children begin to understand some of the workings of the human ear? Can they suggest some of the ways we try to reduce the sounds that we hear? Do pupils understand that we hear because sound waves (vibrations) enter our ears? Can they explain why we see lightning before we hear thunder?	To compare the diets of different animals, and to use the evidence of the food they eat to answer questions. To use websites to research the diets of different animals. **(Computing cross curricular link)** Can pupils compare the diets of other animals to that of a human? Can they explain the different diets of carnivores, herbivores and omnivores? Are they able to research information using the Internet (and/or information books)?	To know that scientists are able to classify living things by closely observing them. To look at the work of artist Levon Biss and to record the details of local living things using close observational drawings. **(Art cross curricular link)** Can children use a branching database /dichotomous classification key? Do pupils make careful and accurate observational drawings of an invertebrate found in the local environment and annotate species specific features?	To begin to consider how the local environment has changed and why these changes may have happened. To discuss with others the positives and negatives of a proposed change to the local environment. Can the pupils consider how the area around the school and school grounds might have changed over time? Do they understand why the changes have happened? Are they able to debate about a proposed change to an area in the school environment? **(Fieldwork / mapping link Geography)**

		To know that water moves in a cycle due to changes in temperature causing the water to change from one state to another. Can pupils explain the water cycle and changes to water during the evaporation and condensation process? Do they recognise evidence of condensation and evaporation within a simple practical task?	To make a circuit with a buzzer and a switch and record the circuit in a labelled diagram To answer questions using scientific evidence to support them To use tools and equipment to make a light up card that uses electricity, and selecting materials for their functional properties, (for example being able to conduct electricity). Can children draw a scientific diagram of their circuit? Can pupils use their understanding of electrical circuits to consider how electrical gadgets work? **Did they create an effective and well finished light up Christmas card?**	To investigate sound-proofing materials by planning and conducting a fair test, considering all the variables and how to record the results. To design functional and appealing ear-defenders for young people to wear at music concerts. Can the children consider reasons needed to reduce sounds and reasons for not reducing sounds? Do they consider the different variables of their test and plan how to ensure their investigation is fair? Can they record the results of an investigation and use the results to draw a conclusion?	To use their understanding of producers, predators and prey to answer questions about the impact of changes to a food chain. Can children define 'predator', 'prey' and 'producer'? Do they make links between plants and animals in the form of food chains? Can pupils discuss with others the impact a break in the food chain may have?	To notice the tiny details that will help scientists to further classify living things and to record these details in a careful drawing of insects. Do pupils understand that it is the tiny details that will help scientists further classify living things? Can pupils demonstrate their knowledge of the classification of living things by playing a game?	To recognise that changes to an environment can be dangerous to living things and to begin to understand what can be done to reverse some of the changes. Can they explain what the impacts of some environmental changes are, both positive and negative? Do they understand the potential impact of deforestation? Can pupils explain what they can do to help minimise the impact of climate change? Are they able to suggest (and implement) positive changes to their own environment to support plants and animals as well as humans?

		To replicate some of the simple practical enquiries and use them to provide evidence to support their learning about States of Matter. To present their learning in the role of a science expert, to visitors of the 'Science Fair'. Can pupils demonstrate their scientific expertise about states of matter to others? Do they use scientific evidence to answer questions and to support their learning about states of matter?	To demonstrate an understanding of electrical circuits, including naming its basic parts and drawing a labelled diagram. To answer questions about conductors and insulators. Can pupils create a buzz wire game? Are they able to explain the scientific rationale behind their circuits?	To answer questions about the results of the investigation into sound reduction and to demonstrate an understanding of sound, including how it is made and how it travels. To describe the features of their sound-reducing product and to explain how they chose to test the different materials. To evaluate their product and consider what improvements they could make. Do pupils provide evidence to show that the results of their product testing came from a fair test? Can they evaluate their product against the original criteria?	To explain to others what they know about teeth and digestion and food chains. To create a PowerPoint presentation or online quiz to demonstrate their understanding of the concepts. **(Computing cross curricular link)** Can children include scientific language when explaining concepts? Did they explain facts clearly and accurately? Were they able to use PowerPoint and try to identify how to change the slide transitions, background design and include images, text boxes and hyperlinks to convey information effectively?	To create and use a classification key to name a variety of living things in the wider environment. To explain to a younger audience how to group living things and to lead them in a questioning game. **(English cross curricular link)** Can pupils write a branching database for a variety of living things from the wider world? Are children able to demonstrate an understanding of their learning by explaining it to others?	To know that if an environment changes it can be dangerous to living things and to explain why. To plan positive changes to a local environment and use evidence to answer questions about why they are making the changes. Can pupils devise a plan of how they would change a local environment for the better? Did they work effectively in a group to plan how to make positive changes to a small local area? (school based or wider community if possible) Can pupils describe the changes they are making and explain to others, which living things will benefit from the changes they are making? **(Fieldwork / mapping link Geography)**

Y5		Autumn		Spring	Summer	
Topic		Materials and their Properties (Cross-curricular links - DT: making Irish soda bread, making a model of a boat. Art: designing topic front covers)	Living things and their habitats – Life Cycles	Earth and Space (English biography - famous scientists, writing up investigations. History - Copernicus, Ptolomy, Galileo, Sir Isaac Newton (forces) scientific theories from the past. Geography - Northern/Southern hemisphere. RE/PSHE human body)	Forces DT: making models, History English– biography of famous scientists from the past	Animals including humans - Human Life Cycles PSHE – RSE
Working Scientifically		**During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** • **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** • **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** • **using test results to make predictions to set up further comparative and fair tests** • **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations** • **identifying scientific evidence that has been used to support or refute ideas or arguments**			

National Curriculum objectives		Pupils should be taught to: • compare and group everyday materials on the basis of properties, including hardness, solubility, transparency, conductivity (electrical, thermal), and response to magnets; • know that some materials 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 this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	Pupils should be taught to: • describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.	Pupils should be taught to: • 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; • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	Pupils should be taught to: • 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.	Pupils should be taught to: • describe the changes as humans develop to old age.

Whole unit	Expected outcomes	• To devise ways of testing different material's properties; • To xplain the uses of a material according to its properties; • To explain and investigate the process of dissolving; • To explain and investigate how to separate different materials; • To identify new materials created during an irreversible change in the context of burning; • To identify the variables in investigations; • To make observations and draw conclusions; • To ask and answer questions based on their learning.	• To be able to explain the function of different parts of a flower; • To show differences between sexual and asexual reproduction; • To identify features of plants that are pollinated by insects or the wind; • To identify stages of sexual reproduction and explain the classification of different types of mammal; • To know about the life and work of Jane Goodall and other naturalist scientists; • To compare the stages of the lifecycles of plants, mammals, amphibians, insects and birds.	• To describe the Earth, Sun and Moon as spherical; • To identify scientific evidence to support and refute ideas over the centuries; • To name and describe features of the planets of the solar system and to place them in the correct order; • To distinguish between geocentric and heliocentric planetary movement; • To explain with the help of labelled diagrams how night and day occur; • To show with evidence how different places on earth experience night and day at different times; • To report and represent findings through diagrams and explanations; • To explain how the earth and moon move relative to the sun.	• To describe what weight is, and how the impact caused by falling objects can vary, depending on their size, shape, mass, and the height they fall from; • To describe what friction is and some ways in which it can be measured; • To be able to identify instances of high and low friction and conduct friction investigations; • To be able to explain ways in which air resistance and water resistance affects moving objects; • To show how simple machines can make it easier to move objects; • To explain how gears work together in transmissions and look at a variety of transmissions; • To make models to explore in greater depth how gears work.	• To describe the main stages in the life cycle of humans; • To describe factors which may affect the rate of growth in humans; • To understand about sexual reproduction, fertilisation and pregnancy for humans; • To compare the gestation periods of humans with other animals; • To look at changes during infancy and childhood; • To look at how the needs of children change over time as they develop; • To explain the roles of some hormones in the body, and how they affect changes in boys and girls at the start of puberty; • To Identify and describe changes that occur inside and outside the body during puberty and adolescence, including sperm production and menstruation; • To describe how children can stay fit and healthy during puberty; • To describe changes in the body that occur

							during adulthood and old age; • To consider how the elderly can stay fit and healthy.
	Visits/trips/ Workshops	Materials workshop – Mrs Knowles				Forces workshop – Mill Green BBC live lesson – balloon powered cars	Mrs Stewart – school nurse
	Vocab	Dissolve, solution, *transparent, opaque, reversible, irreversible*, material, hard, soft, *durable, flexible*, heating, cooling, substance, filtering, sieving, evaporation, properties, conductor, insulator, magnetic, mixture, separate	Mammal, insect, amphibian, *reproduction, sexual, asexual, pollination, gestation, stamen, anther, filament, pollen, petal, stigma, style, ovary, ovule, sepal, stem*, natural scientist, research, protection, species, endangered.	Spherical, scientific evidence, planets, Mercury, Venus, Earth, Jupiter, Saturn, Uranus, Neptune, *orbit, rotate, axis*, seasons, time line, Pluto, dwarf planet, telescope, satellite, hemisphere		Force, gravity, pushes, pull, earth's gravitational pull, *levers, pulleys, weight, mass, friction*, gravity, air resistance, water resistance, *buoyancy*, mechanism, streamlined	*Puberty, gestation, hormones, menstruation, sperm, reproduction, development, pubic hair, adolescence,*
Weekly learning objectives specific to St. Michael's (progression of skills) key questions		To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. What happens to some materials if you mix them with water? What do dissolve, solution, react and soluble mean? Is dissolving a reversible or irreversible change?	To investigate the best material for making a boat Which sort of materials float? How can you make something waterproof? Does your boat need to be streamlined? How could you test your boat?	To explore Jane Goodall's work with chimpanzees Why was Jane Goodall's work so important? What do naturalists do? Why is the work of naturalists so important? Why can't secondary sources of scientific always be trusted?	To investigate night and day How does the rotation of the earth on its axis create day and night? Why does the sun appear to move across the sky? How long does it take for the Earth to make a full rotation?	To explain and understand that gravity is a force Why do objects fall towards the centre of the Earth? What is the link between the mass of an object and the amount of force with which gravity acts on it?	To recognise growth and development in humans What are the main stages in the lifecycles of humans? What are the age ranges for each of the stages? What are the physical changes that occur at each stage?

		To test different materials to see if they are thermal conductors or insulators What is a conductor? Insulator? Which materials are conductors/insulators? What sort of material would be good for creating a lunch box? How will we test the different materials?	End of unit assessment independent task– To plan and carry out an investigation of the dissolving of colour from a skittle How will I make my investigation a fair test? What stages of an investigation do I need to carry out? What criteria should I use for my investigation?	To identify the stages of a bird's lifecycle What are the stages in the life cycle of a bird? How does the life cycle of a bird differ from other animals that we have studied?	To explain night and day and the seasons in different parts of the earth What are the differences between the seasons? How does the tilt of the Earth's axis explain the seasons? How are the seasons different in different hemispheres? How can it be day in one part of the earth and night in another?	To identify the effects of friction acting between moving surfaces What is friction? How can friction be useful and why?	To know the gestation period of humans What are the main stages of gestation in humans? How do embryos and foetuses grow and develop in the womb?
		To investigate irreversible changes. What is a reversible or irreversible change? How can heating or cooling cause an irreversible change? Can some materials when mixed together be separated again? How?	To describe the different parts of a flower and how plants reproduce. Can you describe the functions of different parts of a flower? Can you describe sexual reproduction in flowering plants? Can you identify and label the parts of a flower?	End of unit assessment – to investigate the gestation and life span of different mammals. What is gestation? Why do some animals have a longer gestation than others?	To find out what stars are and investigate different constellations. How is a star created? What is a star made up of? What is a constellation? Can you draw a constellation?	To identify and explain the effects of air resistance. What is air resistance? Can you investigate air resistance? Can you draw conclusions from your investigation?	To know about puberty and the changes that take place in our bodies (2weeks). What changes occur inside and outside of the body during puberty? Which parts of the body change during puberty? What role do hormones play in the growth of humans? How do boys and girls differ during puberty? How can teenagers look after themselves during puberty?
		To explain that some changes form new materials, and that these changes are not usually reversible. Which materials when mixed together cannot be separated again? Can some materials when mixed together create a new substance? What different substances can be created?	To explore asexual reproduction in plants. What is asexual reproduction? How do plants reproduce asexually? Can you describe the lifecycle of an asexually reproducing plant?	To explain why we know that the Sun, Earth and Moon are spherical. Can you describe the shape of the sun, earth and moon? Can you define what orbit means? Can you describe the movement of the sun, earth and moon?	To describe the movement of the moon. Can you name and order the phases of the moon? How are the phases of the moon created?	To identify and explain the effects of water resistance. What is water resistance? How does it affect an object moving through water? Can you plan and carry out an investigation making sure it is a fair test?	

		To explain that burning can form new materials and that it is irrerversible. What happens when a material is burned? What materials are formed after burning? What hazards occur when you burn something?	To describe the life cycle of a mammal. What are the stages in the life cycle of a mammal? How do different mammals reproduce?	To name and describe the features of the planets in our solar system. Can you name the planets of the solar system? Can you name the planets in order from the nearest to farthest away from the sun?	L.O: To design a planet using prior knowledge of earth and space. What features will your planet have? Will it sustain life? How far away from the sun will it be?	To recognise that levers and pulleys allow a smaller force to have a greater effect. How do leavers and pulleys allow a smaller force to have a greater effect? Can you make and improve a model using a lever and or a pulley?	To recognise stages of development during childhood. What are the needs of a new born baby? How are human babies different from other mammals? What are the stages of development that occur during childhood?
		To compare and group together everyday materials on the basis of their properties Can you describe materials according to their properties? Can you sort materials according to their properties? How might certain properties of materials be useful?	To describe the life cycle of an amphibian and an insect What are the stages in the life cycle of an amphibian and an insect? How does their lifecycle compare to a mammal?	LO: To explain how planets move within our solar system What is the difference between geocentric and heliocentric models of the solar system? What is a solar system? What are the differences between current theories and those of Copernicus and Ptolomy?	End of unit assessment: To draw diagrams to support their explanation of the solar system Can you use labelled diagrams to help you explain our solar system?	To recognise that gears allow a smaller force to have a greater effect. Does the size of a gear effect the amount of force? Can you make 2 or more gears work together?	To understand how the body changes during adulthood and old age How do the needs of humans change during their life cycle? How can older people look after themselves? How does the human body change in old age?

Y6		Autumn		Spring		Summer
Topic		Light (Cross-curricular link with Maths – Measurement and graphs)	Electricity (Cross-curricular link with D&T – Electronic quiz game and Moving vehicle)	Living things and their habitats – Classification (Cross-curricular link to History – Famous scientists)	Animals including humans – The Circulatory System (Cross-curricular link to PE and exercise)	Living things and their habitats- Evolution and Inheritance (Cross-curricular link to History – Famous scientists)
Working Scientifically		**During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:** • **planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** • **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** • **recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** • **using test results to make predictions to set up further comparative and fair tests** • **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations** • **identifying scientific evidence that has been used to support or refute ideas or arguments**				
National Curriculum objectives		Pupils should be taught to: • 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	Pupils should be taught to: • 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	Pupils should be taught to: • 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	Pupils should be taught to: • 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	Pupils should be taught to: • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • 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

Whole unit	Expected outcomes	• To explain how light travels to enable us to see; • To understand that all objects reflect light; • To identify the angles of incidence and reflection; • To understand refraction as light bending or changing direction; • To explain how a prism allows us to see the visible spectrum; • To understand how shadow change size; • To understand that shadows are the same shape as the object that casts them; • To make observations and draw conclusions from investigations using mathematical representations.	• To explain how our understanding of electricity has changed over time; • To draw circuit diagrams using the correct symbols and label the voltage correctly; • To explain the effect of increasing or decreasing the voltage on different parts of a circuit; • To decide which variables to control while planning an investigation; • To decide how to report their findings; • To make new predictions based on the previous results; • To select an appropriate scientific enquiry.	• To give reasons for the classification of animals, using examples as a guide; • To classify living things using the Linnaean system; • To match groups of animals to their characteristics; • To classify creatures based on their characteristics; • To design a creature that has a specific set of characteristics, using prompts; • To describe the useful and harmful effects of different microorganisms; • To identify the variables in an investigation into harmful microorganisms; • To draw conclusions; • To describe characteristics of different microorganisms; • To describe characteristics of groups of organisms, using images as prompts.	• To demonstrate prior knowledge of systems within the human body; • To explain the specific functions of the lungs in the circulatory system; • To understand the processes of how water and nutrients are transported in the body; • To state the beneficial impact of a healthy diet and exercise on the human body; • To describe how smoking cigarettes impacts negatively on the body; • To decide on the most appropriate type of investigation for their question; • To take repeat readings if necessary; • To report the degree of trust they have in their results.	• To develop an understanding of the development of evolutionary ideas and theories over time; • To explain how human evolution has occurred and compare modern humans with those of the same genus and family; • To understand that adaptation and evolution is not a uniform process for all living things; • To give examples of selective and crossbreeding.
	Trips/visits/ workshops		Visit from Setpoint to build electronic games.	Microorganisms workshop run by a parent scientist.		

	Vocab	Light, ***source,*** travel, ***straight line, waves, ray, beam, wave, photon, energy,*** reflection, ***angle, incidence, normal, periscope, refraction, bend, lens, focus, focal point,*** transparent, spectrum, ***wavelength,*** colour, ***prism, visible, transparent, rainbow.***	Electricity, ***Thomas Edison, Nikola Tesla, Alessandro Volta, Michael Faraday,*** home, ***alternating current,*** direct current, battery, ***cell,*** Bulb, wires, switch, motor, buzzer, scientific, ***informal,*** circuit, diagram, Voltage, buzzer, circuit diagram, brightness, loudness, ***increase, decrease,*** investigation, plan, fair test, ***comparative test,*** practical enquiry, wire, length,	Classify, sort, group, similarities, differences, compare, ***Carl Linnaeus, Linnaean, classification, standard, domain, kingdom, phylum, class, order, family, genus, species, microorganism, fungus, bacteria, virus, microscopic, mould, cell, eukaryote, nucleus, DNA, bacteria, organism,*** vertebrates, invertebrates, mammals, birds, amphibians, reptiles, fish, insects, ***arachnids, molluscs, crustaceans, annelids,*** plants, flowering, non-flowering.	System, ***circulatory, circulation, skeletal, muscular, digestive, organs, heart, lungs, blood vessels, aorta, atrium, ventricle, artery, vein, pulmonary, superior vena cava, inferior, pulmonic, aortic valve, trachea, bronchus, bronchiole, diaphragms, air sacs, alveoli, capillary, intercostal muscles and ribs, nutrients, nutrition, heart, lungs, stomach, gall bladder, liver, small intestine, large intestine, pancreas, liver, kidneys, rectum, bladder, healthy, lifestyle,*** diet, exercise, nutrition, nutrients, food, water, ***cells,*** vitamins, minerals, protein, fats, carbohydrates, fibre, fitness, healthy, unhealthy, ***pulse, heart rate,*** results, evidence, ***smoking, drugs, legal, illegal, alcohol, kidneys, air sacs (alveoli), brain,*** mouth, fingers, toes, ***blood vessels.***	***Inheritance,*** animals, plants, humans, parent, offspring, similarities, differences, characteristics, ***variation,*** adaptation, environment, habitat, ***DNA, genes, adaptive traits, mutation, replication, accidental, evolution, theory of evolution,*** fossil, fossil records, evidence, complete, incomplete, ***ancestor, common ancestor, apes,*** mammals, ***homo sapiens***, family, ***genus, species, taxonomy, human intervention, selective breeding,*** environment, ***inherited traits, genetic, modification.***

Weekly learning objectives specific to St. Michael's (progression of skills), key questions		To recognise that light appears to travel in straight lines. To explore how a shadow is formed. To represent and report on findings. How does light travel? How do we know? How are shadows formed?	To explain the importance of the major discoveries in electricity. What are the main influential discoveries for the development of electricity? Which scientists were instrumental in these discoveries?	To give reasons for classifying animals based on their similarities and differences. What is classification? How can animals be classified based on their similarities and differences?	I can identify and name the parts of the human circulatory system. What is the human circulatory system? What are the parts of the human circulatory system?	To explain the scientific concept of inheritance. What is meant by evolution and inheritance? What are cells, chromosomes, DNA and genes. What is meant by variation? What are inherited characteristics?
		To explore how to change the size of a shadow. To take accurate measurements. To identify and manage variables in an investigation. How can we change the size of a shadow? How can we plan an investigation and represent our finding mathematically? Cross-curricular link with Maths – measurement and graphs	To observe and explain the effects of differing volts in a circuit. How do differing volts affect the performance of components within a circuit?	To describe how living things are classified into groups. Who was Carl Linnaeus? What is the Linnaeus classification system? How does it work? Cross-curricular link with History – Carl Linnaeus, famous scientist.	I can describe the functions of the main parts of the circulatory system. What are the functions of the main parts of the human circulatory system?	To demonstrate understanding of the scientific meaning of adaptation. What is an environment? What is a habitat? What different types are there? What does adapted mean? What is adaptation?
		To explore how light behaves at reflective surfaces. To present findings and conclusions. What happens to light when it reaches a reflective surface? How could we investigate how light behaves when it reaches a reflective surface?	To observe and explain the effects of differing volts in a circuit. How do differing volts affect the performance of components within a circuit?	To identify the characteristics of different types of animals. To classify a creature based on its characteristics. How can characteristics be matched with their correct animal class?	I can explain how water and nutrients are transported within the body. What are nutrients? How do we get nutrients? How are nutrients transported around the body?	To identify the key ideas of the theory of evolution. What is meant by evolution? What is meant by inheritance? Cross-curricular link with History – Charles Darwin, famous scientist.

		To apply the ideas of how light travels to explain how we see things. To use secondary sources to answer questions. How is light involved in how we see things?	To use a range of tools/equip to build circuits to produce an electronic quiz game. *Working scientifically-* To make predictions & observations. How are components used within a circuit in real life situations? Cross-curricular link with D&T – designing and making an electronic quiz game.	To describe and investigate helpful and harmful microorganisms. To plan an investigation. To set up an investigation and make observations at regular intervals. To record results. What are microorganisms? What is the difference between helpful and harmful microorganisms?	I can describe how diet and exercise impact on human bodies. What is meant by a healthy lifestyle? What is necessary for a healthy lifestyle? What is the impact of diet and exercise on the body?	To identify evidence for evolution from fossil records. How can fossils be used as evidence of evolution? Why is Charles Darwin important?
		To explore how light can be reflected and bent in various ways. To make observations. How can we reflect and bend light?	To design and make a fully operational circuit for a moving vehicle. How are components assembled for real life uses? Cross-curricular link with D&T – designing and making a moving vehicle.	To identify the characteristics of different types of micro-organisms. To draw conclusions from investigations. What conditions cause mould to grow? What conclusions can I draw conclusions from investigation?	I can plan a scientific enquiry. I can record, report & present results appropriately. What is the impact of exercise on keeping healthy? How can this be measured? Cross-curricular link with PE – Exercise and heartrate investigation.	To understand how human beings have evolved. Why was the theory of human evolution controversial? What evidence is there to support the theory of evolution?
		To explore how white light can be split up. To make observations and raise further questions to investigate. To recognise that light is made up for more than one colour. How is white light made up? How can it be split into different colours? What is refraction?	To consider the impact of various ways of making electricity on the environment. To consider alternative forms of electricity production. To use results to make predictions and suggest further tests to conduct. What impact does electricity have on the environment? What alternative forms of electricity production are available?	To classify organisms found in my local habitat. To explain the classification of organisms found in my local habitat. What living things/organisms can I find in the school habitat? What observations can I make?	I can explain the impact of drugs and alcohol on the body. I can describe how scientific evidence highlighted the dangers of smoking. What impact do drugs and alcohol have on the body?	To explain how adaptations can result in both advantages and disadvantages. To explain how human intervention affects evolution. What are the advantages and disadvantages of adaptation? What is selective breeding? What is cross breeding? What is genetic modification?