St Dennis Primary Academy
Science Long Term Plan
"The important thing is to never stop questioning." - Albert Einstein

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Nursery	Pupils will discover people, plants, creatures and objects e.g. Looking at photographs of family members and commenting on shared human features, using different materials to construct and exploring outside to find and name minibeasts Children will use their senses to explore the world around them e.g. Tasting new foods, walks around the village and sensory trays Forces will begin to be explored e.g. Building car ramps and jumping, swinging and climbing in the outside area Pupils begin to learn about life cycles e.g. Observing the process of caterpillars changing into butterflies and then releasing them into the wild					
Reception	Pupils will explore similarities and differences within the natural world e.g. Making observational drawings of plants and humans, noticing and recording changes in weather and categorising animals Children will investigate and understand important processes and changes e.g. Freezing and melting water, the changes of the seasons and noticing how humans grow and change over time Pupils will make observations and be encouraged to ask questions about why things happen and how things work e.g. Ogden investigations, growing plants and exploring vehicles first hand					
Year 1	**Chemistry**: Everyday materials		**Biology**: Animals including humans	**Biology**: Animals including humans	**Biology**: Plants	
Year 2	**Biology**: Animals including humans	**Chemistry**: Use of Everyday materials		**Biology**: Living things and their habitats	**Biology**: Plants	
Year 3	**Chemistry**: Rocks	**Biology**: Animals including humans	**Physics**: Forces and Magnets	**Biology**: Plants	**Physics**: Light	
Year 4	**Biology**: Living things and their habitats	**Biology**: Animals including humans	**Physics**: Sound	**Chemistry**: States of Matter	**Physics**: Electricity	
Year 5	**Physics**: Earth and Space	**Chemistry**: Changes and properties of materials	**Physics**: Forces	**Biology**: Living things and their habitats	**Biology**: Animals including humans	
Year 6	**Physics**: Electricity	**Physics**: Understand light and seeing	**Biology**: Understand evolution and inheritance	**Biology**: Understand animals and humans		**Biology**: Investigate living things

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EYFS – Nursery						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Understanding the World	Discussing family members and their features Exploring how things work. Using senses to explore	Exploring materials both inside and out Discussing what they see	Exploring forces	Noticing differences between people Life cycles	Respecting the environment and living things	Caring for plants
Vocabulary	question, answer, find out, equipment, sort, talk about					

EYFS – Reception						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Builds On	**Nursery** Discussing what they see	**Nursery** Using senses to explore	**Nursery** Respecting the environment and living things Caring for plants			**Nursery** Life cycles
Understanding the World	Exploring the natural world	Describing what they can see, feel and hear outside	Making observations and drawings of animals and plants		Understand the effect of changing seasons	Knowing similarities and differences between the natural world around them and in other places Explore and understand important processes and changes in the natural world
Ogden Trust Investigations		Magic Snow Fizzing Candy Canes	Spider Webs Bubble Snakes	Super Spaghetti Walking on Egg Shells	Magnetic Motors Marble Run	Pendulum Painting Sinking Eggs
Vocabulary	question, answer, observe, equipment, sort, group, talk about, describe, compare, record, investigate					
Working Scientifically Skills	Describe what you see Ask questions about the world around you Predict what you think might happen Measure: Is it bigger or is it smaller? Draw what happened Sort or group items by answering yes or no questions					
Enrichment			Screech Owl sanctuary visit	Aspens Healthy Eating working		Nature walk in the local environment

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			Building animal habitats	Planting herbs		Newquay beach trip

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Year 1				
	Autumn 1	Spring 1	Spring 2	Summer 1
Science Unit	**Chemistry:** Everyday Materials	**Biology:** Animals including humans	**Biology:** Animals including humans	**Biology:** Plants
Builds On	Reception – Autumn Children explored different materials in EYFS. They discussed the textures of different materials and used different materials during model making activities.	Reception – Spring 1 Children have explored different animals during EYFS. They have learnt the names of different animals and their features.	Nursery/Reception – Autumn - Senses Children looked at the similarities and differences between themselves and their classmates.	Nursery/Reception – Spring 2 – Food Children explored different plants during EYFS. They may have learnt the names of different plants and their features. They grew their own plants from seeds and watched the different stages of plant growth. They learnt about food that grows.
Memory Master	Sorting objects according to what they feel like.	Recognition of animals and their similarities or differences	Identification of our five senses	Recognition that some of our food comes from plants
Overview	Learn about different materials and be able to identify objects made from different materials. They will be able to identify the difference between an object and the material from which it is made. Children will group and sort different materials based on their properties. They will also have the opportunity to investigate different materials to see which material would be best to make a waterproof shelter.	Learn about different common animals and be able to discuss their features using scientific language such as feathers, beak, scales, fins etc. They will begin to identify similarities and differences between different animals. Children will also look at the diets of different animals and compare these.	Learn about humans, identifying body parts and linking these to senses as well as discussing the similarities and differences between humans.	Learn about different wild and common plants and label their basic features. They will look for wild plants in their local area and discuss plants that we can eat. Children will then look at trees and their basic features. They will look at the difference between deciduous and evergreen trees before looking at different leaves from trees. Children will plant a seed and keep a plant diary during the rest of the lessons to show how their plant grows and changes.
Unit Vocabulary	**materials** **wood** **plastic** **glass** **metal** **rubber** **rock** **fabric** **hard** **soft** **stretchy** **bumpy**	**animal** – a living thing **herbivore** – an animal that just eats plants **carnivore** – an animal that just eats meat **omnivore** – an animal that eats both plants and animals **mammal** – a type of animal that has hair on its body and drinks milk **bird** – a type of animal with feathers, wings and a beak	**senses** – what we use to gather information about the world around us **sight** – what you can see **sound** – what you can hear **smell** – what you can smell **taste** – what you can taste **touch** – what you can feel	**plant** – a living organism **tree** – a woody plant **deciduous** – a tree that loses its leaves annually **evergreen** – a tree the does not lose its leaves **flower** – the seed-bearing part of a plant that is usually surrounded by brightly coloured petals **roots** – the part of the plant that attaches into the ground for support and nutrient collection **stem** – the main stalk of a plant

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	dull **rough** **smooth** **waterproof** – when water does not soak through a material and runs off **absorbent** – when water is soaked up by a material	**fish** – a type of animal with scales, fins and lives in water **reptile** – a type of animal with scales that lives on land **amphibian** – a type of animal that is born in water but then develops lungs and lives on land		**leaf** – part of a plant that is typically flat and hangs off the stem
Working Scientifically Vocabulary	question, answer, observe, observing, equipment, identify, classify, sort, diagram, chart, map, data, compare, contrast, describe, biology, chemistry, physics, group, record			
Working Scientifically Skills	Make observations using simple equipment Asking simple questions Decide what data you need to record Perform simple tests Gather and record data using tables and photos to help answer your question Identify and classify using what I know			
Lesson Sequence	1. I can identify a variety of everyday materials. 2. I can describe the physical properties of a variety of everyday materials. 3. I can distinguish between an object and the material from which it is made. 4. I can compare and group together a variety of everyday materials on the basis of their simple physical properties. 5. I can investigate the properties of different fabrics.	1. I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. 2. I can compare a variety of common animals including fish, amphibians, reptiles, birds and mammals. 3. I can identify and name a variety of common animals that are carnivores, omnivores and herbivores.	1. I can identify, name, draw and label the basic parts of the human body. 2. I can identify which part of the body is associated with each sense. 3. I can compare humans.	1. I can identify different plants. 2. I can identify and describe the basic structure of plants. 3. I understand that plants can grow. 4. I can name a variety of common wild plants. 5. I can name a variety of common plants that we can eat. 6. I can identify, name and describe the basic structure of deciduous and evergreen trees.
Critical Knowledge and Understanding	• Knows and can identify the material from which an object is made • Can name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • Knows that everyday materials have different physical	• Can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals e.g., cat, robin, adder, frog, salmon	• Can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• Knows and can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. • Can identify and describe the basic structure of a variety of common flowering plants, including trees.

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	properties • Knows how the properties of a material can make it useful for a range of different purposes • Knows that different materials can share the same properties (for example glass and plastic can both be transparent)	• Can identify and name a variety of common animals that are carnivores, herbivores and omnivores • Can describe and compare the structure of a variety of common animals		
Enrichment opportunities			Paradise Park visit	Lost Gardens of Heligan visit

Seasonal Changes (Throughout the whole year)
Vocabulary **spring** – the season in which plants begin to grow **summer** – the warmest season of the year **autumn** – the season in which some trees lose their leaves **winter** – the coldest season of the year **rain** – when water falls from the clouds **sun** – the bright sphere in the sky that provides light and warmth **change** – when something is different
Critical Knowledge and Understanding Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies

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Year 2				
	Autumn 1	Autumn 2	Spring 2	Summer 1
Science Unit	**Biology**: Animals including humans	**Chemistry**: Use of everyday materials	**Biology**: Living things and their habitats	**Biology**: Plants
Builds On	Year 1 Spring 2 Children looked at different parts of the human body and the related sense.	Year 1 Autumn 1 Children looked at different objects and the material from which they are made. They identified a variety of everyday materials and described their properties such as wood, plastic, glass, metal, water and rock. Children compared and grouped together a variety of objects made from different materials.	Year 1 Spring 1 Children studied different animals and grouped them based on their features and diet.	Year 1 Summer 1 Children learnt about different plants and trees and described the basic structure.
Memory Master	Parts of the body and senses	Sort objects and label with correct type of material and properties	Grouping of animals based on their features	Name types of trees (deciduous and evergreen) and parts of a plant
Overview	Learn about the basic needs that all humans need to survive and live. They will study more closely the importance of exercise, a healthy diet and good hygiene as ways to keep us healthy. They will also look at offspring of different animals and how they develop and change into adults as they grow.	Learn about different everyday materials such as wood, metal, plastic, glass, rubber, rock, fabric, paper and brick. They will identify the properties of these materials and conduct investigations to explore how different materials are better suited for different objects. Children will also explore how some of these materials can be changed by squashing, bending, twisting and stretching them.	Learn about living things and their habitats. The will look at whether things are living, dead or have never been alive. Also at microhabitats and larger habitats identifying some animals that may live there. Children will then conduct an investigation to see which type of conditions woodlice prefer in their habitat. After that they will look at how living things are adapted to their environment. They will also look at simple food chains within habitats.	Learn about different seeds and bulbs. Learn about plants we can eat and begin to gather seeds. They will also look at what plants need to grow and what they need to continue to grow and stay healthy.
Unit Vocabulary	**basic needs** – the things humans need to survive **diet** – the food we eat **exercise** – moving our bodies **hygiene** - keeping clean **illness** – when we do not feel well/ feel sick/ have a disease **medicine** – something we might take to feel better **offspring** – the babies of an animal	**waterproof** – when water does not soak through a material and runs off **absorbent** – when water is soaked up by a material **transparent** – something you can see through **materials** **wood** **plastic** **glass** **metal**	**adapted** – how something has adjusted **alive** – something that is living **conditions** – the state of something **dead** – something that was living but is not anymore **living** – something that is alive **habitat** – the place in which a living thing lives **microhabitat** – a small habitat **food chain** – a series of living things that feed from each other	**plant** – a living organism **tree** – a woody plant **flower** – the seed-bearing part of a plant that is usually surrounded by brightly coloured petals **roots** – the part of the plant that attaches into the ground for support and nutrient collection **stem** – the main stalk of a plant **leaf** – part of a plant that is typically flat and hangs off the stem

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	seven basic needs – **movement, respiration, sensitivity, growth, reproduction, excretion** and **nutrition** **survive** – to live	**rubber** **rock** **fabric** **hard** **soft** **stretchy** **bumpy** **dull** **rough** **bend** **stretch** **twist** **squash**	**omnivore** – an animal that eats both plants and meat **herbivore** – an animal that just eats plants **carnivore** – an animal that just eats meat	**seed** – a small part of a plant that can grow another plant **bulb** – a fleshy base of a plant that can grow another plant
Working Scientifically Vocabulary	question, answer, observe, observing, equipment, identify, classify, sort, diagram, chart, map, data, compare, contrast, describe, biology, chemistry, physics, group, record			
Working Scientifically Skills	Make observations and use them to answer my questions Asking simple questions and knowing they can be answered in different Decide what data you need to record Perform simple tests to gather evidence to answer questions Gather and record data or measurements in tables, tally to bar charts			
Lesson Sequence	1. I can find out about and describe the basic needs of animals, including humans, for survival. 2. I notice that animals, including humans, have offspring which grow into adults. 3. I can gather and record data. 4. I can describe the importance for humans to exercise. 5. I can describe the importance for humans to eat the right amounts of different types of food. 6. I can describe the importance for humans to have good hygiene.	1. I can identify a variety of everyday materials. 2. I can distinguish between an object and the material it is made from. 3. I can investigate the properties of different materials and how we can change them (by bending etc). 4. I can investigate the properties of different materials (suitability for purpose).	1. I can explore and compare the differences between things that are living, dead, and things that have never been alive. 2. I can identify and name a variety of plants and animals in their habitats, including microhabitats. 3. I can identify and name a variety of plants and animals in their habitats. 4. I can observe closely and use my observations to answer questions (best conditions for woodlice). 5. I can identify that most living things live in a habitat to which they are suited. 6. I can construct a simple food chain.	1. I can identify that fruit, vegetables and herbs are a type of plant that we eat. 2. I can observe and describe how seeds grow into mature plants. 3. I know what plants need to grow and stay healthy. 4. I can explain the life cycle of plants.

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Critical Knowledge and Understanding	• Knows that animals including humans have offspring which grow into adults, using the appropriate names for the stages • Knows that to survive animals need sunlight, water, air, food and a suitable habitat (including shelter for protection from predators and the environment. • Understands the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	• Knows and can identify the material from which an object is made • Can name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock • Knows that everyday materials have different physical properties • Knows how the properties of a material can make it useful for a range of different purpose • Knows that different materials can share the same properties (for example glass and plastic can both be transparent)	• Knows and can explain the differences between things that are living, dead, and things that have never been alive. • Knows that most living things live in habitats to which they are suited. • Knows and can describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other. • Knows and can name a variety of plants and animals in their habitats, including micro-habitats. • Knows and can describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and make the different sources of food.	• Can describe how seeds and bulbs grow into mature plants. • Can describe how plants need water, light and a suitable temperature to grow and stay healthy.
Enrichment opportunities	Visit from a doctor Pizza Express workshop		School grounds habitat hunt Visit to Newquay Blue Reef Aquarium and Towan beach – sea and rock pool habitat	Planting workshop with ClayTAWC Discovering 4-2 Science Museum visit

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Year 3					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Science Unit	**Chemistry:** Rocks	**Biology:** Animals including humans	**Physics:** Forces and Magnets	**Biology:** Plants	**Physics:** Light
Builds On	Year 2 Autumn 2 Children learnt about soil during plant topics. Children will have also learnt some of the properties of rocks during topics about different materials.	Year 1 Spring 1 Children looked at how to group animals including based on their diet. Year 2 Autumn 1 Children studied animals and their offspring and the basic needs that animals need to survive.	Year 2 Autumn 1 Children investigated how some materials can be changed by bending, squashing, twisting and stretching and link those movements to simple pushes and pulls.	Year 1 Summer 1 Children learnt about different plants and trees and described the basic structure. Year 2 Summer 1 Children studied how plants grow from seeds and bulbs in more detail and what they need to grow and stay healthy.	Year 1 In learning throughout seasonal changes topic, children observed and talked about changes in the weather and the seasons. Year 2 Summer 1 Children observed the effect of light on plant growth.
Memory Master	Can give examples of what materials are suitable for different purposes and why (including vocabulary).	Know what humans need to survive and stay healthy.	Explain what happens to objects when they are stretched, bent, twisted or squashed and whether this is a push or pull force.	Name some types of plants and trees (including deciduous and evergreen). Explain what a plant needs to grow and stay healthy.	Name the seasons and how light changes and affects plants and animals.
Overview	Explore different rocks and soils. They will classify and group together rocks based on their appearance as well as their physical properties. They will learn how the Earth is made up of different rocks and fossils and begin to explain how some of the different rocks are formed. Children will also look at fossils, what they are and how they are formed in rock.	Learn about the structure of the human skeleton and how the muscles also work alongside the skeleton to support and protect the human body. They will then look at how skeletons differ in different animals. Children will look at nutrition and the importance of eating a healthy diet.	Explore simple pushes and pulls as an introduction to forces. They will explore how the texture of an object or the surface it is on can affect how the object moves. They will explore pushes and pulls further by investigating different magnets and how they can pull (attract) and push (repel) at a distance without contact.	Find out what plants need in order to stay healthy once they have grown. They will identify and describe the functions of the different parts of plants. They will explore what plants need for life and growth. Children will then complete an investigation to see how water is transported through plants. Children will also look at seeds and explore the different ways that plants disperse their seeds.	Recognise that they need light in order to see things and that dark is the absence of light. They will learn to identify light sources; explore what happens when light reflects off mirrors or other reflective materials and think of ways to protect themselves from the Sun. They will investigate which materials make the best/worst shadows and conduct an experiment to find out about the relationship between the height of a light source and the length of a shadow. Children will also experience a range of activities to discover how mirrors work.

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Unit Vocabulary	**rock** – a solid material that makes up the surface of the Earth **soil** – a black or dark brown material on the upper layer of the Earth where plants grow **fossil** – the remains of a prehistoric animal embedded in rock **appearance** – what something looks like **physical properties** – a characteristic of an object **permeable** – water can flow through this type of rock **impermeable** - water cannot flow through this type of rock **sedimentary** – rocks formed from sediment that builds up over time **metamorphic** – rocks that have changed their form due to heat and pressure **igneous** – rock formed from molten magma **magma** – rock that is so hot, it has been turned into liquid **bedrock** – hard, solid rock that lies under looser soil	**nutrition** – food or nourishment **skeleton** – the framework of bones that supports the body of an animal **muscles** – a bundle of tissue in the body of an animal that can contract enabling movement **healthy** – good for your health **unhealthy** – not good for your **health diet** – the food that an animal eats **bones** – a solid part of the skeleton **vertebrate** – an animal with a backbone (spine) **invertebrate** - an animal without a backbone (spine)	**force** – a push, pull, twist or turn caused when two objects interact with each other **magnet** – an object or device that attracts iron or another magnetic material contact – touching **non-contact** – not touching **attract** – pull towards **repel** – push away **magnetic**– attracted to a magnet **non-magnetic** – not attracted to a magnet **iron** – a metal that can be made into a magnet **north and south pole** - the two ends of a magnet that have opposite magnetic fields	**plant** – a living organism **tree** – a woody plant **flower** – the seed bearing part of a plant that is usually surrounded by brightly coloured petals **roots** – the part of the plant that attaches into the ground for support and nutrient collection **stem** – the main stalk of a plant **leaf** – part of a plant that is typically flat and hangs off the stem **seed** – a small part of a plant that can grow another plant **bulb** – a fleshy base of a plant that can grow another plant **nutrients** – something that provides nourishment to a living thing **pollination** – the transfer of pollen to allow fertilisation **formation** – to create **dispersal** – to distribute or spread over a wide area	**light source** - something that emits light **dark** - the absence of light **reflect** - a surface (or body) that throws back light without absorbing it **shadow** - an area where direct light from a light source cannot reach due to obstruction by an object **opaque** - opaque materials do not let any light pass through them and they block the light **translucent** - translucent materials let some light through, but scatter the light in all directions so that they cannot see clearly through them **transparent** - transparent materials let light pass through them in straight lines so that you can see clearly through them **luminous** - giving off light, bright or shining
Working Scientifically Vocabulary	**Research**: relevant questions, scientific enquiry, comparative and fair test, systematic, careful observation, accurate measurements **Equipment**: thermometer, data logger **Data**: gather, record, classify, present **Record**: drawings, labelled diagrams, keys, bar charts, tables, **Oral and written explanations**: conclusion, prediction, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret				
Working scientifically skills	Make careful observations and use them to answer my question Ask relevant questions Use my prior knowledge to make predictions				

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	Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables Plan and perform fair tests Using information from the data say what you have found out Take accurate measurements using scientific equipment				
Lesson Sequence	1. I can compare and group together different kinds of rocks on the basis of their appearance. 2. I can compare and group together different kinds of rocks on the basis of their physical properties (investigation about how they are different) - Investigation 1 (hard-wearing). Scratch with a pin and give it a rating. - Investigation 2 (how durable). Rub the rock gently with sandpaper to see how much 'dust' is created. - Investigation 3 (waterproof). Drip water onto the rocks. - Investigation 4 (damaged by acid) Drip vinegar on the rocks 3. I can explain how some rocks are formed. 4. I can explain how the Earth is made up of different layers of rocks and soils. I can describe how fossils are formed when things that have lived are trapped within rock.	1. I can identify that humans have bones for support, protection and movement. 2. I can set up a simple practical enquiry. I can communicate my results. (Do people with longer legs jump further? Do people with longer arms throw further?) 3. I can identify that humans have muscles for support, protection and movement. 4. I can identify that some other animals have bones for support, protection and movement. 5. I understand that animals, including humans, need the right type of nutrition.	1. I can compare how different things move (pushes and pulls). 2. I can plan and conduct a fair test to compare how objects move on different surfaces (fair test). 3. I can explore how magnetic forces act at a distance (investigation about whether objects are repelled or attracted from a distance). 4. I can compare and group various everyday materials based on whether they are attracted to a magnet. 5. I can predict whether two magnets will attract or repel each other, depending on which poles are facing. 6. I can record my findings using simple scientific vocabulary. I can use my results to draw simple conclusions.	1. I can explore the requirements of plants for life and growth. 2. I can identify, locate and describe the function of different parts of flowering plants. 3. I can identify, locate and describe the function of the roots in plants. 4. I can investigate the way in which water is transported within plants. 5. I can explore the part that flowers play in the life cycle of flowering plants, including pollination. 6. I can explore the part that flowers play in the life cycle of flowering plants, including seed formation and seed dispersal.	1. I can recognise that there needs to be light in order to see things and that darkness is the absence of light. 2. I can notice that light is reflected from surfaces. 3. I can recognise that light from the Sun can be dangerous and that there are ways to protect your eyes from the Sun. 4. I recognise that shadows are formed when a light source is blocked by an opaque object. 5. I know that shadows take on the shape of the opaque object. I can predict where a shadow will form in relation to an opaque object and a light source. I can find patterns in the way that the length of shadows change. 6. I know that light is reflected from surfaces (mirrors).

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Critical Knowledge and Understanding	• Can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • Can describe in simple terms how fossils are formed when things that have lived are trapped within rock • Know that soils are made from rocks and organic matter	• Know 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	• Recognise how things move on different surfaces • Notice that some forces need contact between two objects, but magnetic forces can act at a distance • Can explain how magnets attract or repel each other and attract some materials and not others • Can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic material • Know that magnets have two poles	• Can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • Know 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 • Recognise the way in which water is transported within plants • Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.	• Know that light is needed to see things and that dark is the absence of light • Know that light is reflected from surfaces • Know that light from the sun can be dangerous and that there are ways to protect their eyes • Know that shadows are formed when the light from a light source is blocked by an opaque object • Recognise patterns in the way that the size of shadows change
Enrichment opportunities			Dartmoor Zoo visit (Y3/4)		Eden Project visit – Rainforest (Y3/4)

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Year 4					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Science Unit	**Biology:** Living things and their habitats	**Biology:** Understand animals and humans	**Physics:** Sound	**Chemistry:** States of Matter	**Physics:** Electricity
Builds On	Year 1 Summer 1 Learnt to describe the basic structure of a variety of common flowering plants. They will have compared differences between living and non-living things. Year 2 Spring 2 Learnt differences between living and non-living things; identified that most living things live in habitats that they are suited to and understand how living things in that habitat depend on each other. They constructed basic food chains.	Year 1 Spring 1 Year 2 Spring 2 Learnt common animals that are carnivores, omnivores and herbivores. Compared animals such as birds, fish, reptiles, amphibians and mammals. Named basic parts of the body and which part is associated with each sense. Learnt that most living things live in habitats and constructed simple food chains. Year 3 Autumn 1 Learnt about healthy diets and nutrition and how the skeleton protects and supports.	Not taught previously in science. Children will have some knowledge of pitch and volume through their music lessons.	Year 1 Autumn 1 Year 2 Autumn 2 Learnt to compare and group materials on the basis of their simple properties. They explored how to change the shape of solids by bending, twisting, squashing and stretching.	Not taught as a discrete topic, however children may have looked at which items use electricity in other curriculum areas (e.g. Toys topic in history in Year 1)
Memory Master	Name habitats and animals which live there. Make a food chain for one of the habitats.	Name parts of the body/bones and explain the function of bones and muscles.	New learning about sound so assess knowledge of pitch and volume. Revisit vocabulary from light unit from Year 3.	Revisit types of rocks and their properties using vocabulary: permeable, impermeable, sedimentary, metamorphic, igneous.	New learning about electricity. Revisit vocabulary from sound unit.
Overview	Learn to recognise the seven life processes common to all living things. Learn to sort living things using a variety of criteria and extend their use of scientific vocabulary to describe features and characteristics of animals and plants. They will conduct a local habitat search and learn to identify unknown living things	Learn about the importance of the digestive system. They will learn the names and functions of each part of the system and be able to identify the different types of teeth in humans and their purpose. The children will plan and conduct an investigation to answer the question: which drink causes the	Learn that vibrations cause sounds and how sounds travel through different mediums at different speeds. Explore how sounds can change in pitch and loudness and be able to explain this using scientific language. They will develop their scientific skills by planning a fair test investigation to answer the	Learn to compare and group materials according to whether they are solids, liquids or gases. Learn that some materials change state when they are heated or cooled and be able to identify and name these processes as melting, freezing, evaporating or condensing.	Learn to sort common electrical appliances into battery and mains powered. Construct simple series circuits containing a variety of components and understand the difference between complete and incomplete circuits. They will be able to identify whether or not a bulb will light in a simple series

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	using a classification key. Children will consider how environmental change impacts the local area and suggest ways in which humans can prevent further damage.	most tooth decay? They will extend their knowledge of food chains by constructing and interpreting a variety of food chains, identifying producers, predators and prey.	question: Does the size of the pinnae affect the volume of the sound? Learn what happens to sound vibrations when they reach the ear.	Learn about the water cycle and be able to identify the part played by evaporation and condensation in the water cycle. Children work scientifically to plan and conduct investigations involving melting and evaporation. They will learn to associate the rate of evaporation with temperature.	circuit and put forward ideas to fix incomplete circuits. The children will plan and conduct an investigation to discover which materials make good insulators and design, construct and test their own switches.
Unit Vocabulary	**environment** – the conditions (both living and non-living) that surround an organism **classify** – to arrange a group of people or things in classes or categories according to shared qualities or characteristics **vertebrate** – an animal that has a backbone **invertebrate** – an animal without a backbone **bird** – a type of animal with feathers, wings and a beak **fish** – a type of animal with scales, fins and lives in water reptile – a type of animal with scales that lives on land **amphibian** – a type of animal that is born in water but then develops lungs and lives on land **mammal** – an animal that breathes air, has a backbone, and grows hair **reptile** - an air-breathing cold-blooded egg-laying vertebrate with an outer covering of scales or plates and a bony skeleton	**canines** – ripping teeth **carnivore** – animals that only eat other animals **digestion** – the process of breaking down food into simple chemicals for the body to absorb **herbivore** – animals that only eat plants **incisor** – cutting teeth large intestines – where water is absorbed into the blood **molars** – grinding teeth oesophagus – food and water pipe **omnivore** – animals that eat both plants and animals **peristalsis** – muscular action to move food along the digestive tubes **predator** – an animal that hunts, kills and eats other animals for food **prey** – a term used to describe organisms that predators kill for food **producer** – a plant in a food chain	**vibrate/vibrations** - forward and backward movement of an object (usually rapidly). **volume** - how loud or quiet a sound is. **pitch** - how high or low a sound is. **pinna** - the outer portion of the ear (ear flap). **cochlea** - the sound reception part of the inner ear. **ear drum** - the membrane which collects sound from the pinna and passes it to the inner ear	**change** - to make different **collection** - when water flows back into rivers, streams and lakes and gets carried back to sea **condensation** - when water vapour cools and turns back into **water evaporation** - when water is heated and turns into water **vapour freeze** - when something is put at a very low temperature **gas** - a state of matter that has no defined shape or volume **heat** - when something is put at a hot temperature **liquid** - a state of matter that flows freely but keeps the same volume **precipitation** - when water falls from the clouds in the sky **property** - a characteristic **solid** - a state of matter that is firm and stable **temperature** - how hot or cold something is **thermometer** - an instrument used for measuring temperature	**appliance** – a device or piece of equipment that has been made to perform a specific task **battery** – a small item used to power small appliances **circuit** – a route through which electricity flows **components** – the parts of a circuit **conductor** – allows electricity to flow through it **current** – the rate of flow of electricity measured in amps **electrical** – something that uses electricity to work **insulator** – doesn't allow electricity to flow through it **mains power** – electricity provided by power stations **portable** – can be easily carried around **pylon** – a tower used for keeping electrical wires above the ground **switch** – a device for controlling the flow of electricity in a circuit

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	exoskeleton – a rigid external covering for the body in some invertebrate animals **key** – a questioning device that allows the progressive narrowing down of the classification of an unknown living thing based on observable or testable features **adaptation** – the way in which an organism is particularly suited to its environment **pollution** – the introduction into the environment of a substance which has harmful effects **movement** – to move in position **respiration** – breath in oxygen and breath out carbon dioxide **sensitivity** – the way organisms respond to their environment **growth** – how humans and adults change as they become older **reproduction** - creation of a living thing from an existing organism **excretion** – get rid of waste from the body **nutrition** – food or nourishment	**saliva** – a lubricating digestive juice produced in the mouth **small intestines** – where food is broken down and nutrients are absorbed into the blood **stomach** – a rounded vessel in the body where acid and digestive juices break down food			
Working Scientifically Vocabulary	**Research**: relevant questions, scientific enquiry, comparative and fair test, systematic, careful observation, accurate measurements **Equipment**: thermometer, data logger **Data**: gather, record, classify, present **Record**: drawings, labelled diagrams, keys, bar charts, tables, **Oral and written explanations**: conclusion, prediction, differences, similarities, changes, evidence, improve, secondary sources, guides, keys, construct, interpret				
Working Scientifically Skills	Make careful observations and use them to answer my questions Ask relevant questions Use my prior knowledge to make predictions Record findings using simple scientific language, drawings, labelled diagrams, key, bar charts and tables				

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	Plan and perform fair tests and explain how the test is fair Use information from the data to answer my question Take accurate measurements using scientific equipment and standard units of measure				
Lesson Sequence	1. I can develop descriptions using relevant scientific language and vocabulary (7 Life Processes MRS GREN) 2. I can recognise that living things can be grouped in a variety of ways (5 main animal groups/herbivore, omnivore, carnivore) 3. I can recognise that living things can be grouped in a variety of ways (vertebrates / invertebrates) 4. I can explore and name a variety of living things in my local environment. 5. I can explore and use classification keys to help group, identify and name a variety of living things in my local environment. I can recognise that environments can change and that this can sometimes pose dangers to living things.	1. I can name the basic parts of the digestive system and describe their functions. 2. I can identify the different teeth and describe their functions. 3. I can plan and carry out an investigation. 4. I can communicate my results. 5. I can construct and interpret a variety of food chains. 6. I understand what producers, predators and prey are.	1. I can identify how sounds are made, associating some of them with something vibrating. 2. I can recognise that vibrations from sounds travel through a medium to the ear. 3. I can recognise that vibrations from sounds travel to the ear. 4. I can investigate if the size of the pinna affects the volume of the sound. I can report my findings from enquiries. 5. I can find patterns between the pitch of a sound and features of the object thatproduced it (panpipes and lengths to see relationship with pitch) 6. I can find patterns between the volume of a sound and the strength of the vibrations that produced it (data logger to record volume)	1. I can identify solids, liquids and gases. 2. I can take accurate measurements using thermometers (different places in school). 3. I can observe that some materials change state when they are heated or cooled. 4. I can identify the part played by evaporation and condensation in the water cycle. 5. I can plan and carry outa fair test (evaporation from water in on clothes) I can associate the rateof evaporation with temperature.	1. I can identify common appliances that use electricity. 2. I can construct a simple circuit and name the parts of the circuit. 3. I can identify if a bulb will light up in a circuit. 4. I can recognise common conductors and insulators (investigation). 5. I can investigate switches.
Critical Knowledge and Understanding	• Know that living things can be grouped in a variety of ways • Can use classification keys to help group, identify and name a variety of living things in their local and	• Know the simple functions of the basic parts of the digestive system in humans • Know the different types of teeth in humans and their simple functions	• Know how sounds are made, associating some of them with something vibrating • Know that vibrations from sounds travel through a medium to the ear	• Know how to group materials together, according to whether they are solids, liquids or gases • Know that some materials change state when they are heated or cooled, and	• Know 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

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	wider environment • Understand that environments can change and that this can sometimes pose dangers to living things	Can construct and interpret a variety of food chains, identifying producers, predators and prey	• Can find patterns between the pitch of a sound and features of the object that produced it • Can find patterns between the volume of a sound and the strength of the vibrations that produced it • Know that sounds get fainter as the distance from the sound source increases.	measure or research the temperature at which this happens in degrees Celsius (°C) • Know the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Know 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 • Understand that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • Know some common conductors and insulators, and associate metals with being good conductors
Enrichment opportunities		Climate zones workshop at Eden (Y4/5)	Dartmoor Zoo visit (Y3/4) Geevor Tin Mine visit (Year 4/5)		Eden Project visit – Rainforest (Y3/4)

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Year 5					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Science Unit	**Physics:** Earth and Space	**Chemistry**: Properties and changes of materials	**Physics:** Forces	**Biology:** Investigate living things	**Biology:** Animals including humans
Builds On	Year 1 As part of the seasonal change learning, children may have observed changes across the seasons and observed/described weather changes. Year 3 Summer 1 Learnt about the Sun as a light source and observed that shadows are formed when an opaque object blocks out light and that the Sun's position in the sky appears to change through the day.	Year 2 Autumn 2 Children consolidated knowledge gained in Year 1 and learnt to identify and compare the use of a various materials for particular uses. They investigated how the shape of solid materials can be changed by squashing, bending, twisting and stretching. Year 4 Summer 1 Children learnt to compare and group materials according to whether they are solids, liquids or gases. They observed that some materials change state when heated or cooled and measured or researched the temperature at which this happens in degrees Celsius. They identified the part played by evaporation and condensation in the water cycle and associated the evaporation rate with temperature.	Year 2 Autumn 2 Explored different materials and discovered which ones can change shape when they are squashed, bent, twisted or stretched. They made link between those movements and simple pushes and pulls. Year 3 Spring 1 Explored simple pushes and pulls as an introduction to forces. They explored how the texture of an object, or the surface it is on, can affect the way the object moves. They investigated pushes and pulls by experimenting with different magnets and exploring how they can pull (attract) and push (repel) too, but at a distance with no contact.	Year 1 Summer 1 Year 2 Summer 1 Learnt to describe the basic structure of a variety of common flowering plants. They will have compared differences between living and non-living things. Year 3 Spring 2 Learnt to identify and describe the function of various parts of a plant. Explored the part flowers play in the life cycle including pollination, seed fertilisation and seed dispersal.	Year 2 Spring 2 Children studied humans and other animals and their young. They studied life cycles such as butterfly or frog to show how animals change as they grow. Year 3 Spring 2 Children studied life cycles of plants which could be linked to the life cycle of humans.
Memory Master	How are shadows formed?	What are solids, liquids and gases? Water cycle – evaporation.	Explanation of magnets, poles, attract and repel along with what materials are magnetic.	How can we group or classify a set of animals or plants?	Produce life cycles of butterfly or frog and plant.
Overview	Learn that the Earth is part of the solar system and that the Sun is at the centre of that system. Learn the names of the other planets (based on their	During this unit of work, children will consolidate previous learning by revisiting the properties of solids, liquids and gases; learn to describe the	Children consolidate and extend their knowledge of forces by naming individual forces (e.g. gravity, friction, upthrust). They will extend their knowledge of	Learn the seven life processes that distinguish living from non-living things. They will consolidate and extend previous learning on the life cycles of	Learn about the different stages of the human life cycle. They will discuss a simple timeline first before going into more depth about what happens in the

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	distance from the Sun) and be able to describe the movement of Earth (and other planets) in relation to the Sun. Children will discover why there is day and night on Earth and relate this to time. They will plan an investigation to answer the question - what happens to the Sun during the daytime? Children will also gain an understanding of the phases of the Moon and be able to describe the Moon's movement in relation to the Earth.	properties of materials using scientific language; investigate which materials make the best thermal insulators; and which materials are magnetic. Children will be introduced to key scientific vocabulary to describe the properties of materials (e.g. soluble and insoluble) and investigate how to separate materials using these properties. They will be able to name separation methods (filtering, sieving, evaporation, magnets) and decide on the most efficient method for separating a mixture of materials. They will be able to describe change as reversible or irreversible.	frictional forces (air resistance and water resistance) and plan fair test investigations to discover which shoe has the greatest friction and which shapes offer the most water resistance. They will learn how forces can be helpful and unhelpful in various scenarios and identify the forces involved in each scenario. They will learn what a mechanism is and how pulleys, levers and gears are used to allow a smaller force to have a greater effect.	plants and animals, comparing and describing differences in the life cycles of mammals, amphibians, reptiles, birds and insects. They will learn how animals and plants reproduce; comparing differences and similarities between five different animal groups.	womb, during puberty and when you are older.
Unit Vocabulary	**orbit** – the rotation that one body in space takes around another when under gravitational influence **axis** – an imaginary line going through a central body that most bodies in space rotate around **day** – length of time the Earth takes to rotate on its axis once **month** – the length of time the Moon takes to complete one orbit around the Earth (not exactly equal to a calendar month) **planet** – a non-luminous body that orbits a star	**soluble** - a substance that will dissolve in water **insoluble** - a substance that will not dissolve in water **saturation** - the point at which no more solute can be dissolved **solution** - a soluble solid is dissolved in liquid to form a solution **filtration** - the collection of larger particles in a mixture **boiling** - the process by which molecules of a liquid change to vapour (much faster change than evaporation) **condensing** - the change of vapour into a liquid	**force** – a push or pull that acts upon an object that can cause it to move, change shape or change direction **friction** – the force that acts upon one surface when it moves against another **gravity** – a pull force that acts at a distance **pull** – to move something towards **push** –– to move something away **repel** – to push away. **resistance** – an opposing or slowing force **drag** – the frictional force experienced by an object moving through a fluid or air	**fertilisation** – the point at which the sperm from the pollen meets the egg in the ovary **pollination** – the process by which the pollen reaches the stigma **pollen** – granule that delivers the male genetic material to the female seed **stamen** – the male part of the flower, comprising of the anther and filament **pistil** – the female part of the flower consisting of the stigma, style and ovary **seed dispersal** – the method used by a plant to spread out its seeds	**birth** – when your life starts as a physically separate being **conception/fertilisation** – when the egg and the sperm meet to begin the development of a foetus **death** – when the life cycle ends **develop** – to grow to become more mature or advanced **egg** – the female sex cell **foetus** – a baby that is still developing in the womb **puberty** – a time in the human life cycle when the body goes through changes to become an adult **sperm** – the male sex cell **womb** – an organ in which the foetus grows and develops

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	solar system – the name given to the Sun and all the bodies orbiting around it **year** – the period the Earth takes to complete one orbit of the Sun **gravity** – the force of attraction between two masses	**conductor** – allows electricity to flow through it **evaporation** - change from a liquid to a vapour freezing - the change of a liquid to a solid **melting point** - the point at which a solid substance liquefies **chemical change** - one where the molecular structures of the combined substances are broken down and recombined to make a new substance **physical change** - where the molecular structures of the combined substance stay separate, allowing separation to occur **reversible change** - a physical change that we can undo **irreversible change** - a physical change that we cannot undo **transparent** – can see through it	**streamlined** – a shape which minimises the profile presented by an object in order to minimise the resistance it encounters when moving through a liquid or gas **upthrust** or **buoyancy** – the upward force exerted on a body by a fluid that surrounds it, equal and opposite to the weight of the water displaced **Newton (N)** – the unit used to measure force. **gear** –two wheels with serrated or notched rims that mesh together to transfer movement **lever** – usually a rigid bar with a pivot point close to one end, allowing movement at one end of the lever to be converted into a smaller movement at the other, which effectively magnifies the force applied. **pulley** – a wheel with a grooved rim that allows the transfer of movement via a belt or band.	(usually by wind, water or animals) **reproduction** – the combining of genetic material from two individuals to produce new life	
Working Scientifically Vocabulary	plan, variables, measurements, accuracy, precision, repeat, readings **Record Data:** scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs, predictions, further comparative and fair test, report and present conclusions, causal relationships, explanations, degree of trust, oral and written display and presentation **Evidence:** support, refute ideas or arguments identify, classify and describe, patterns, systematic, quantitative, measurements				
Working Scientifically Skills	Decide what observations to make in practical investigations Make observations over time Ask a range of questions and identify the type of enquiry that will help answer it Make predictions and justify why using scientific vocabulary Recording findings using tables, scientific diagrams, bar charts and scatter graphs Plan a range of scientific experiments using scientific equipment in both fair and comparative tests Being able to spot and explain patterns in my results Take accurate and precise measurements using scientific equipment				

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Lesson Sequence	1. I can describe the planets in the solar system. 2. I can describe the Sun, Earth and Moon as approximately spherical bodies. 3. I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. 4. I can describe the movement of the Moon relative to the Earth. 5. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	1. I can compare and group materials according to whether they are solids, liquids or gases and name their properties. 2. I can investigate the thermal insulation of different materials. 3. I can compare and group materials based on their response to magnets. 4. I know that some materials dissolve in a liquid to make a solution. 5. I can predict how I could separate mixtures. 6. I can explain why some changes are irreversible.	1. I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and falling objects. 2. I can identify the effect of friction between moving surfaces. 3. I can plan different types of scientific enquiries to answer questions, including recognising and controlling variables. I can take measurements using a range of scientific equipment. (Whose shoe has the greatest friction) 4. I can identify the effect of air resistance (investigation – best aeroplane and why). 5. I can identify the effect of water resistance (investigation – shapes in water) 6. I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect.	1. I can discuss the seven life processes. 2. I can explain how mammals reproduce. 3. I can explain how animals reproduce. 4. I can describe the differences in the life cycles of mammals, amphibians, reptiles, insects and birds. 5. I understand reproduction in plants. 6. I can explain the life cycle of plants.	1. I can describe the human life cycle. 2. I understand how a foetus develops in the womb. 3. I can describe what happens when I am a teenager. 4. I can describe what happens when I am a senior.
Critical Knowledge and Understanding	• Can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Can describe the movement	• Understand you can group everyday materials based on their properties, including their hardness, solubility, transparency, conductivity	• Can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling objects.	• Can describe the differences in the life cycles of a mammal, an amphibian, a reptile, an insect and a bird,	• Can describe the changes as humans develop to old age.

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	of the Moon relative to the Earth. • Can describe the Sun, Earth and Moon as approximately spherical bodies. • Can use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.	(electrical and thermal), and response to magnets. • Know that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how we might separate mixtures, 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. • Know that dissolving, mixing and changes of state are reversible changes. • Can explain that some changes result in the formation of new materials and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on the bicarbonate of soda.	• Can identify the effects of air resistance, water resistance and friction, that act between moving surfaces. • Know that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	• Can describe the life process of reproduction in some plants and animals.	
Enrichment opportunities		Climate zones workshop at Eden (Y4/5)	Geevor Tin Mine visit (Year 4/5)		

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Year 6					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 2
Science Unit	**Physics:** Electricity	**Physics:** Light	**Biology:** Evolution and inheritance	**Biology:** Animals including humans	**Biology:** Living things and their habitats
Builds On	Year 4 Summer 1 Learnt to sort common electrical appliances into battery and mains powered; construct simple series circuits containing a variety of components. They identified whether or not a bulb will light in a simple series circuit and put forward ideas to fix incomplete circuits. The children conducted investigations to test their own switches.	Year 1 Through seasonal changes learning, children observed and talked about changes in the weather and the seasons and will have talked about the dangers of looking at the Sun directly. Year 2 Summer 1 Observed the effect of light on plant growth. Year 3 Summer 1 Learnt they need light in order to see things and that dark is the absence of light. They will have learnt to identify light sources; explore what happens when light reflects off mirrors or other reflective materials and know that the Sun can be damaging to our eyes. They may have investigated patterns in the way the size of shadows changes.	Year 2 Spring 2 Learnt that most living things live in habitats to which they are suited and be able to describe how different habitats provide the basic needs of different kinds of animals and plants. Learnt to identify animals and plants from a variety of environments. They may have noticed that animals have offspring that grow into adults. Year 3 Autumn 1 Learnt how fossils are formed.	Year 3 Autumn 2 Year 4 Autumn 2 Learnt about keeping healthy and about the digestive system which briefly introduces how nutrients are absorbed into the body.	Year 1 Summer 1 Learnt that plants are living things and have had experience naming and sorting plants using a variety of criteria. Learnt the basic structure of plants and conducted experiments to determine what plants need to grow well. Year 2 Spring 2 / Summer 1 Extended their knowledge of plants to include the life cycle of a plant and learnt about seeds. Learnt about habitats (including microhabitats) and that animals and plants live in habitats that suit them. Also learnt about simple food chains. Year 3 Spring 2 Learnt about flowers, pollination and seed dispersal. Year 4 Autumn 1 Consolidated their understanding of habitats and learnt how to use a basic classification key.

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Memory Masters	Make and label a circuit explaining how switches work.	How is a shadow formed and how can they change?	What animals are suited to that habitat and how? Fossils – how they are formed	Label digestive system. Food groups and why they are all needed	Seed dispersal and lifecycle of a plant
Overview	Consolidate and extend previous learning from Year 4 by constructing simple series circuits and drawing them using scientific symbols. They will conduct investigations to determine how the voltage in a circuit affects the brightness of a bulb. They will use their 'working scientifically' skills to plan an experiment to investigate variations in how components function and use the results to write a clear and concise conclusion. They will use the internet to research information about renewable and non-renewable energy sources.	Consolidate previous learning by exploring the way that light behaves, including light sources, reflection and shadows. Make predictions and investigate the relationship between light sources, objects and shadows and understand how the eye works. Children will extend their experience of light by looking at rainbows, prisms and bending light in water (although they don't need to explain why these phenomena).	Explore how animals and plants are adapted to the environment in which they live. They will learn that adaptations occur over time and that may lead to a species evolving. Children will conduct an experiment to answer the question; which beak is best adapted to pick up a seed? They will consider how certain adaptations occur in response to environmental conditions. They will learn about natural selection and how this links to inheritance and how some characteristics are inherited from parents and some are not. Children will consolidate previous learning on fossilisation and understand how studying fossils has helped explain the theory of evolution.	Learn about the importance of the circulatory system and how it transports oxygen around our body. They will learn about the heart and how it is an important muscle in our bodies. Children will learn about their heart rate and different activities that can increase the heart rate. Children will learn about being healthy and things they can do to lead a healthy lifestyle as well as learning about things that people do that can cause them to be unhealthy.	Learn about classification of living things, including microorganisms. They will learn the names and characteristics of the main groups used to classify animals, plants and microorganisms. Children will learn to use a classification key and create their own key using yes/no questions. Children will investigate the question; Is yeast a microorganism? and conduct an experiment involving the respiration of yeast. They will learn about the life and work of Carolus Linnaeus and understand the importance of his standard classification system.
Unit Vocabulary	**appliance** – a device or piece of equipment that has been made to perform a specific task **battery** – a small item used to power small appliances	**dark** – the absence of light **reflect** – a surface (or body) that throws back light without absorbing it **shadow** – an area where direct light from a light	**adaptation** - When a plant or animal has changed in some way, usually over a long period of time, to be better suited to the environment in which they live.	**absorb** – take in or soak up **aorta** - the main artery in the human circulatory system **atriums** - the upper chambers of the heart	**classify** – to arrange a group of people or things in classes or categories according to shared qualities or characteristics

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	circuit – a route through which electricity flows **components** – the parts of a circuit **conductor** – allows electricity to flow through it electrical – something that uses electricity to work **insulator** – doesn't allow electricity to flow through it **mains power** – electricity provided by power stations **pylon** – a tower used for keeping electrical wires above the ground **renewable energy** – energy from a source that is not depleted when used, such as wind or solar power **non-renewable energy** – energy from a source that is depleted when used, such as coal, gas and oil	source cannot reach due to obstruction by an object **opaque** – opaque materials do not let any light pass through them and they block the light **translucent** – translucent materials let some light through, but scatter the light in all directions so that they cannot see clearly through them **transparent** – transparent materials let light pass through them in straight lines so that you can see clearly through them **luminous** – giving off light, bright or shining **scattering** – when light is returned from a surface **absorption** – when light strikes a surface and is retained within it. **refraction** – the 'bending' of light when it passes from one transparent material to another.	**environment** - the conditions that surround an organism. **evolution** - the process by which different kinds of living organisms are believed to have developed from earlier forms during the history of the Earth. **gene** - A unit of heredity which is transferred from a parent to offspring and is held to determine some characteristics of the offspring. **natural selection** - When the fittest, most adapted organisms survive and multiply whilst the least adapted die out. **inheritance** - the reception of genetic qualities by transmission from parent to offspring. **organism** - an individual animal, plant or single-celled life form. **species** - a group of similar organisms that are able to reproduce.	**blood vessels** - tubes that carry blood around the body **heart** – a muscle that pumps blood around the body **lungs** – spongy air filled organs that provide oxygen to the blood **blood** – a liquid that carries oxygen, water and nutrients around the body **veins** – carry deoxygenated blood to the heart **arteries** – carry oxygenated blood away from the heart **heart rate** – the number of times our heart beats per minute **deoxygenated** - blood that is not carrying oxygen **heart** – a muscle that pumps blood around the body **oxygenated** - blood that is carrying oxygen **nutrients** - substance that provides nourishment essential for the maintenance of life and for growth **vena cava** – a large vein that carries deoxygenated blood into the heart. **ventricles** - the main chambers of the heart	**vertebrate** – an animal that has a backbone **invertebrate** – an animal without a backbone **exoskeleton** – a rigid external covering for the body in some invertebrate animals **vascular** – plants that use roots and stems to take in water and nutrients **non-vascular** – plants that do not use roots and stems to take in water and nutrients **taxonomy** – the scientific process of grouping or classifying living organisms Also explain the terms; **herbivore, carnivore, omnivore**; the five main **animal classification groups** (**mammals, birds, fish, reptiles** and **amphibians**) and the five main **microorganism groups** (**bacteria, viruses, protozoa, algae** and **fungi**).

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				villi – finger-like structures that line the small intestine to absorb water and nutrients	
Working Scientifically Vocabulary	plan, variables, measurements, accuracy, precision, repeat, readings **Record Data**: scientific diagrams, labels, classification keys, tables, scatter graphs, bar graph and line graphs, predictions, further comparative and fair test, report and present conclusions, causal relationships, explanations, degree of trust, oral and written display and presentation **Evidence:** support, refute ideas or arguments identify, classify and describe, patterns, systematic, quantitative, measurements				
Working Scientifically Skills	Decide what observations to make in practical investigations Making observations over time Ask a range of questions and recognise and control variables To use your findings to make predictions and set up further enquiries Recording findings using tables, scientific diagram, bar charts, scatter graphs, line graphs and classification keys Plan a range of scientific experiments using scientific equipment in both fair and comparative tests. Being able to spot and explain patters in my results Identify anomalies that do not fit the overall pattern Take accurate and precise measurements using scientific equipment. Make decisions whether to repeat readings or adjust frequency.				
Lesson Sequence	1. I can use symbols when drawing a simple circuit diagram 2. I can associate the brightness of a lamp with the number and voltage of cells used in the circuit. 3. I can investigate variations in how components function. 4. I can investigate variations in how components function and write a conclusion.	1. I can recognise that light appears to travel in straight lines. 2. I can 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. I can predict which materials make good reflectors. 3. I can use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect	1. I can identify how animals are adapted to their environment. 2. I can explain natural selection and how it may lead to evolution. 3. I can explain how adaptations may lead to evolution. 4. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. 5. I can recognise that living	1. I can identify and name the main parts of the human circulatory system. 2. I can identify and name the main parts of the heart. 3. I can investigate which activity increases my heart rate the most. 4. I can describe how water and nutrients are transported in humans. 5. I can identify how humans can live a healthy lifestyle.	1. I can describe how living things can be classified into broad groups. (e,g, nutrition – omnivore, carnivore, herbivore; animal group – fish, amphibian etc; vertebrate/invertebrate) 2. I understand how I can use classification keys to help group, identify and name a variety of living things (key for yes/no) 3. I can describe how living things can be classified into broad group (sort

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	5. I can name renewable and non-renewable sources of energy.	light into the eye. I can explain how the eye works. 4. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. I can explain how shadows change during the day (investigation) 5. I can use the idea that light travels in straight lines to explain that we can see objects because they give out or reflect light into the eye (reflection and refraction) 6. I can 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 (mirrors).	things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago		plants). 4. I understand that microorganisms are also living things (experiment to prove yeast respires and is therefore a living organism) 5. I can describe how living things can be classified into broad groups (5 main groups giving examples of characteristics). 6. I know that scientists have developed different ways to classify living things (Carl Linnaeus).
Critical Knowledge and Understanding	• Can make the association of the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit	• Know that light appears to travel in straight lines • Know that objects are seen because they give out or reflect light into the eye • Can explain that we see things because light	• Know that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago	• Know names of the main parts of the human circulatory system, and can describe the functions of the heart, blood vessels and blood	• Can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including

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	• Can give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • Can use recognised symbols when representing a simple circuit in a diagram	travels from light sources to our eyes or from light sources to objects and then to our eyes • Knows that light travels in straight lines and uses this to explain why shadows have the same shape as the objects that cast them	• Know that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • Understand how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution	• Understands the impact of diet, exercise, drugs and lifestyle on the way their bodies function • Can describe the ways in which nutrients and water are transported within animals, including humans.	microorganisms, plants and animals • Can give reasons for classifying plants and animals based on specific characteristics
Enrichment opportunities			Eden Project visit – Darwin workshop		