Medium Term Unit Planning Progression

This document brings together the national curriculum ambitious end outcomes, with the focused specific substantive and disciplinary knowledge, organised into coherent sequences units with generalisations. The units are organised in a single age format. However, a mixed age sequence can be found at the end of this document and used to rearrange the units appropriately.

Conceptual Headings

The table below is in order of sequence of teaching per curriculum year group and is organised under the main conceptual headings. This supports the focus of the knowledge and the learning sequence that forms the unit to remain focused on the main concepts.

Big Questions:

The document includes suggested big questions for the units intended to support children in thinking about how previous knowledge and newly acquired knowledge fits into their developing schema of science, building a body of knowledge rather than fractured facts. The big questions aim to be appropriate for the stage of learner for example what questions encouraging noticing and identifying in KS1 leading to how questions as expertise develops in KS2. They also aim to refer wherever possible to the main concepts to encourage children to think through this lens.

National curriculum and focused knowledge

The table includes the relevant national curriculum statements to support understanding the overarching aims of the curriculum as well as supporting signposting of possible supporting, materials for example in vehicles. It also contains the focused specific knowledge statements which will form the body of new knowledge to be taught in the unit for both substantive and disciplinary concepts.

Generalisations

The table contains generalisation statements which link the main concepts in science, supporting children to start to make sense of the story of science, linking ideas and concepts together.

Signposting

The table contains some starting points in signposting teachers to possible supporting planning documents through various vehicles available throughout the Trus

Suggested progressive sequential pathway – mixed age

		Autumn		Spring		Summer	
Early	KS1 Year A	Properties/changing materials Compare suitability of materials to their uses and the impact of changing their shape	Alive (Structure and Function) Identify common deciduous trees/ plants and plants their basic parts. Energy - Sun Notice the impact of energy from the sun in Autumn	Alive (Structure and Function) Identify common evergreen trees / plants and their basic parts. Energy - Sun Notice the impact of energy from the sun in Winter	Alive (Structure and Function) Identify common flowering plants / trees and their basic parts. Energy - Sun Notice the impact of energy from the sun in Spring	Properties of materials Identify materials and their properties	Alive (Structure and Function) Identify common wild and garden plants and their basic parts Energy - Sun Notice the impact of energy from the sun in Summer
Novice	KS1 Year B	Alive (Structure and Function) Identify common animals and body parts.	Thrive & Survive Identify what animals need to thrive and survive	Reproduction Notice that animals reproduce	Alive (Structure and Function) Observe how plants grow	Thrive & Survive Identify what plants need to thrive and survive Alive (Structure and Function) Identify the 7 live processes	Thrive & Survive Identify how plants and animals thrive and survive together in habitats
Growing Expertise	LKS2 Year A	Forces: contact & non-contact Notice and compare simple contact and non-contact forces through friction and magnets	Thrive and Survive Explore and investigate nutrition in plants and animals	Thrive and Survive Identify the structure and function of different parts of the digestive system (including teeth)	Thrive and Survive Construct food chains and reason about the impact of environmental change on thrive and survive	Energy - Electricity Explore the impact of an open and closed circuit on electrical energy?	Properties/changing materials Compare rocks and soils and describe fossil formation
	LKS2Year B	Properties/changing materials Observe and measure changes of state	Alive (Structure and Function) Identify the structure and function of human skeleton and muscles and parts of a flowering plant.	Energy - Light Notice light and dark including shadows	Reproduction Explore the function of the flower in pollination and seed dispersal	Diversity Use knowledge of structure of plants and animals to group them	Energy – Sound Explore how sound energy travels in vibration waves
	UKS2Year A	Alive (Structure and Function) Describe how human structure and function changes as they age.	Alive (Structure and Function) Identify the structure and function of main different parts of the human circulatory system	Thrive and Survive Recognise ways in which humans can support or hinder their ability to thrive.	Properties/changing materials Explain the processes and outcomes of some reversible and irreversible changes which include changes of state.	Reproduction Describe and compare the process of sexual reproduction in some animals	Reproduction Describe and compare the process of sexual and asexual reproduction in some plants.
	UKS2Year B	Forces: contact & non-contact Identify and explain the effects of unbalanced forces	Forces: contact & non-contact Describe the orbits of the earth and moon	Alive (Structure and Function) Use knowledge of structure and function of plants and animals to classify them in broad groups	Diversity Identify adaptions and its role in evolution	Energy - Light Explore how light energy travels in straight lines.	Energy – Electricity Explore the impact of varying voltage in a circuit

Year 1	Alive (Structure and Function) Identify common animals and body parts.	Alive (Structure and Function) Identify common deciduous trees/ plants and their basic parts. Energy - Sun Notice the impact of energy from the sun in Autumn	Alive (Structure and Function) Identify common evergreen trees / plants and their basic parts. Energy - Sun Notice the impact of energy from the sun in Winter	Alive (Structure and Function) Identify common flowering plants / trees and their basic parts. Energy - Sun Notice the impact of energy from the sun in Spring	Properties of materials Identify materials and their properties	Alive (Structure and Function) Identify common wild and garden plants and their basic parts Energy - Sun Notice the impact of energy from the sun in Summer
BQ	**How are animals the same and different?**	**What do you notice in our school environment in the autumn?**	**What changes do you notice in the environment in winter?**	**What changes do you notice in the environment in spring?**	**How do we identify different materials?**	**What changes do you notice in the garden in summer?**
NC– Substantive	• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense	• 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	• 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	• 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	• 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	• 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
Essential knowledge	• Know that a fish lives in the water and fins and name some examples e.g.: Mackerel, Bass, Carp, and Trout • Know that a bird has feathers and lays eggs and name some examples e.g.: Gulls, Pigeon, Robin, Barn Owl • Know that a reptile has scaly skin and name some examples • Know that amphibians can live in water and on land and name some examples e.g.: Frog, Toad, Newt • Know that mammals give birth to live young that look like them and name some examples e.g.: Badger, Roe Deer, Hedgehog • Know that carnivores eat only meat and name some examples e.g.: Peregrine Falcon, Atlantic Grey Seal, Stoat • Know that omnivore eat meat and vegetations and name some examples e.g.: Badger, Fox, Wild Boar • Know that herbivores only eat vegetation and name some examples e.g.: Roe Deer, Rabbit, Squirrel • Know that humans have eyes so they can see • Know that humans have ears to hear • Know that humans have a tongue to taste • Know that humans have skin to feel • Know that humans have a nose to smell • Know that humans use their sense to learn about the world.	• Know difference between a plant and a tree • Know the difference between evergreen and deciduous • Know and identify **leaf**, stem, **root**, flower, petal, **branch, trunk, blossom** • Know the names or **deciduous** and **evergreen** trees specifically : Deciduous: English Oak, Ash, Silver Birch Evergreen: Scots Pine, Holly, Yew • To know that the sun is the main source of light energy and heat energy on earth. • To know that there is more daylight in the summer. • To know that the Earth experience least light and heat energy in winter and most in summer. • To notice the impact of changes in light and heat energy through the seasons. • To notice the impact of changes in light and heat energy on the weather.	• Know difference between a plant and a tree • Know the difference between evergreen and deciduous • Know and identify **leaf**, stem, **root**, flower, petal, **branch, trunk, blossom** • Know the names or deciduous and **evergreen** trees specifically: Deciduous: English Oak, Ash, Silver Birch Evergreen: Scots Pine, Holly, Yew • To know that the sun is the main source of light energy and heat energy on earth. • To know that there is more daylight in the summer. • To know that the Earth experience least light and heat energy in winter and most in summer. • To notice the impact of changes in light and heat energy through the seasons. • To notice the impact of changes in light and heat energy on the weather.	• Know the difference between common and wild plants • Know the names of wild and garden plants, specifically: Wild: Wild Garlic, Gorse, Wild Daisy Garden: Hydrangeas, Lavender, Roses • Know and **identify leaf, stem, root, flower, petal,** branch, trunk, blossom • To know that the sun is the main source of light energy and heat energy on earth. • To know that there is more daylight in the summer. • To know that the Earth experience least light and heat energy in winter and most in summer. • To notice the impact of changes in light and heat energy through the seasons. • To notice the impact of changes in light and heat energy on the weather.	• Know that there are different materials which can be identified using observations (including fabric, wood, plastic, glass). • Know that an object is made from / of a material. • Know that properties are the words used to describe what a material is like and what it can do. • Know that different materials have different properties. • Know that a soft material can be twisted and squashed and a hard material cannot. • Know that a stretchy material can be pulled • Know that stiff materials are not easy to bend and flexible materials are. • Know that a shiny material reflects light and a dull material does not. • Know that a rough material has an uneven surface and a smooth material has an even surface. • Know waterproof materials do not let water through and absorbent materials do. • Know that opaque materials do not let light pass through and transparent materials do.	• Know the difference between common and wild plants • Know the names of wild and garden plants, specifically: Wild: Wild Garlic, Gorse, Wild Daisy Garden: Hydrangeas, Lavender, Roses • • Know and **identify leaf, stem, root, flower, petal,** branch, trunk, blossom • To know that the sun is the main source of light energy and heat energy on earth. • To know that there is more daylight in the summer. • To know that the Earth experience least light and heat energy in winter and most in summer. • To notice the impact of changes in light and heat energy through the seasons. • To notice the impact of changes in light and heat energy on the weather.
Generalisation	Animals have different body parts (structure) which allow them to do different things (functions) e.g see, move and eat Animal parts vary and this helps us identify what type of animal they are.	Trees have different parts (structure) e.g. leaves, trunks, blossom. These parts vary and this helps us identify what type of tree it is. The sun is the main source of heat energy and light energy on earth. Energy enables things to happen The amount of heat and light varies through the seasons.		Plants have different parts (structure) e.g. leaves, stems, flowers. These parts vary and this helps us identify what type of plant it is. The sun is the main source of heat energy and light energy on earth. The amount of heat and light varies through the seasons.	Objects are made from materials. Materials have properties (structure) which allow them to do different things (function). These vary and help us to identify what type of material it is.	Some plants and trees grow naturally in an area and some are designed and planted by humans. The sun is the main source of heat energy and light energy on earth. The amount of heat and light varies through the seasons.

Disciplinary Knowledge	**Observing and Measuring** • I know that to observe means to look closely and notice similarities and differences related to my enquiry question **Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I can group things based on given criteria	**Observing and Measuring** • I know observation can be instant or take place over time. • I know that measuring tells the size of something. • I know how to use same sized objects to make measure comparison (rain levels) **Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I know where to place my data on a given simple table • I can add labels to pictures to highlight features I have observed	**Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can add labels to pictures to highlight features I have observed **Asking and exploring Questions** • I know that variables change over time. • I know that scientific questions should be based on something I can observe or measure. **Concluding, prediction, evaluating** • I know that my observations and recordings enable me to answer my question	**Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can group things based on given criteria **Asking and exploring Questions** • I can sort and classify using given criteria • I know that groups and sorting helps us observe similarities and differences. **Concluding, prediction, evaluating** • I know that my observations and recordings enable me to answer my question • I can use my observations and recordings to suggest an answer to my question.	**Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can group things based on given criteria **Asking and exploring Questions** • I can sort and classify using given criteria • I know that groups and sorting helps us observe similarities and differences. **Concluding, prediction, evaluating** • I can use my observations and recordings to suggest an answer to my question. **Communicating** • I know that science has been used and is used to provide solutions **Applications** • I can recognise an application of science.	**Observing and Measuring** • I know how to use a hand lens • I know that a hand lens makes small objects appear bigger **Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can group things based on given criteria **Asking and exploring Questions** • I can sort and classify using given criteria • I know that groups and sorting helps us observe similarities and differences. **Concluding, prediction, evaluating** • I can use my observations and recordings to suggest an answer to my question **Applications** • I can recognise an application of science.
	• Developing Experts - Animals, including humans (All about me) All lessons Plymouth Science – Animals including humans	• Developing Experts - Seasonal Changes – Lesson 1 + 2 (Autumn) AND Plants – Lesson 2 Plymouth Science – Seasonal Changes AND plants	• Developing Experts - Seasonal Changes – Lesson 3 (Winter) AND Plants - Lesson 2 + 4 Plymouth Science – Seasonal Changes AND Plants	• Developing Experts - Seasonal Changes – Lesson 4 (Spring)) AND Plants - Lesson 2 + 4 Plymouth Science – Seasonal Changes AND Plants	• Developing Experts - Exploring Everyday Materials 1 (Lessons 1 –3) Plymouth Science – Materials	• Developing Experts - Seasonal Changes – Lesson 5 (Summer) AND Plants – Lesson 2 + 3 Plymouth Science – Seasonal Changes AND Plants

Year 2

Main concepts	Properties of materials **Compare suitability of materials to their uses and the impact of changing their shape**	Thrive and Survive (Nutrition and growth) **Identify what animals need to thrive and survive**	Reproduction **Notice that animals reproduce**	Alive (Structure and Function) **Observe how plants grow**	Thrive and Survive (Nutrition and growth) **Identify what plants need to thrive and survive** **Alive: Identify the 7 live processes**	Thrive and Survive (Nutrition and growth) **Identify how plants and animals thrive and survive together in habitats**
Big Question	**What can you use different materials for?**	**What do animals need to survive and thrive?**	**What do you notice about animal adults and their offspring?**	**What do you notice about plant adults and their offspring?**	**What do plants need to thrive and survive?**	**How do different habitats help animals and plants to thrive and survive?**
National Curriculum – Substantive	• 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	• 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	• notice that animals, including humans, have offspring which grow into adults	• 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 Alive (Structure and Function) • 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

Essential knowledge	• Know that a material's properties make it suitable for different uses. • Know and apply the properties of plastic to identify objects it is suited and not suited to. • Know and apply the properties of wood to identify objects it is suited and not suited to. • Know and apply the properties of metal to identify objects it is suited and not suited to. • Know and apply the properties of glass to identify objects it is suited and not suited to. • Know and apply the properties of rock to identify objects it is suited and not suited to. • Know and apply the properties of paper to identify objects it is suited and not suited to. • Know and apply the properties of cardboard to identify objects it is suited and not suited to.	• Know that animals need water, food and air to survive. • Know that humans need exercise to maintain their structure and movement. • Know that humans need a balanced diet of carbohydrate, vegetable and protein • Know the importance of hygiene for good health.	• Know that animals have offspring • Know offspring grow into adults • Know the names of common animals and their offspring e.g. egg, chick, chicken, spawn, tadpole, froglet, frog, baby, toddler, teenager, adult.	• Know the difference between a seed and a bulb • Know the difference between a seedling, young plant and mature plant	• Know that plants need water and light and the correct temperature to grow and stay healthy. • Know that the absence of one or more of these will affect the health and growth of the plant. • Know that something that is living has to have 7 life processes (MRS NERG) Movement, Respiration, Sensitivity, Nutrition, Excretion, Reproduction, Growth • Know that a living thing is dead if it no longer has all 7. • Know that it has never been alive If it has never had all 7.	• Know that a habitat is the environment in which an animal or plant usually lives. • Explain why previously studied plants and animals live in their habitats. • Know that a simple food chain starts with a plant and contains one or more animals • Construct a food chain using previously taught animals and plants. • Explain how plants and animals depend on each other.
Generalisation	Materials have properties (structure) which allows them to do different things and therefore impacts how you use them to make objects. If you change the material's properties (structure) you change its use (function)	Animals need energy (food) and materials (air and water) to stay alive. The energy allows their body parts (structure) to do their job (function). Our body parts (structure) works best (functions) when we are healthy (the right conditions).	Adult animal offspring do not always have the same structure and function as their parents but do grow into the same type of adult (species).	Grown plants offspring do not always have the same structure and function as their parents but do grow into the same type of adult (species).	Plants need energy (light), and materials (air and water) to stay alive. The energy allows their parts (structure) to do their job (function). The plants' parts (structure) works best (functions) when they are healthy (have the right conditions). Living things have 7 shared functions (MRS NERG)	Living things live together in habitats. Energy is transferred in habitats through food chains.
Disciplinary Knowledge	**Observing and Measuring** • I know that to observe means to look closely and notice similarities and differences related to my enquiry question **Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I can add labels to pictures to highlight features I have observed • I can group things based on given criteria **Concluding, prediction, evaluating** • I can use my observations and recordings to suggest an answer to my question **Communicating** • I know that science has been used and is used to provide solutions **Applications** • I can recognise an application of science.	**Observing and Measuring** • I know that to observe means to look closely and notice similarities and differences related to my enquiry question **Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I know where to place my data on a given simple table • I know where to place my data on a given bar chart / pictogram/ Venn diagram **Asking and exploring Questions** • I know that scientific questions should be based on something I can observe or measure.	**Observing and Measuring** • I know observation can be instant or take place over time. • I know that measuring tells the size of something. • I know how to use same sized objects to make measure comparison **Performing Tests** • I can follow a modelled investigation in small parts **Recording Data** • I can add labels to pictures to highlight features I have observed **Asking and exploring Questions** • I know that variables change over time. **Concluding, prediction, evaluating** • I know that my observations and recordings enable me to answer my question	**Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I know where to place my data on a given simple table **Asking and exploring Questions** • I know that variables change over time • I know that scientific questions should be based on something I can observe or measure. **Concluding, prediction, evaluating** • I know that my observations and recordings enable me to answer my question **Communicating** • I know that science has been used and is used to provide solutions **Applications** • I can recognise an application of science.	**Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can group things based on given criteria **Asking and exploring Questions** • I can sort and classify using given criteria • I know that groups and sorting helps us observe similarities and differences. **Concluding, prediction, evaluating** • I can use my observations and recordings to suggest an answer to my question. **Communicating** • I know that science has been used and is used to provide solutions **Applications** • I can recognise an application of science.	**Observing and Measuring** • I know how to use a hand lens • I know that a hand lens makes small objects appear bigger **Recording Data** • I know where to place my data on a given bar chart / pictogram/ Venn diagram • I can group things based on given criteria **Asking and exploring Questions** • I can sort and classify using given criteria • I know that groups and sorting helps us observe similarities and differences. **Concluding, prediction, evaluating** • I can use my observations and recordings to suggest an answer to my question **Communicating** • I know that science has been used and is used to provide solutions **Applications** • I can recognise an application of science.
	• Developing Experts - Year 1 Everyday Materials (2) - All lessons AND Year 2 Everyday Materials and their uses Lesson 1, 3, 4, 5 PS – materials	• Developing Experts • PS – Animals including humans AND – Living things and their habitat	PS – Animals including humans	PS – Plants AND Living things and their habitats	PS – Plants AND Living things and their habitat	PS – Living things and their habitat

Year 3	Energy - Light Notice light and dark including shadows	Forces: contact & non-contact Notice and compare simple contact and non-contact forces through friction and magnets	Alive (Structure and Function) Identify the structure and function of human skeleton and muscles and parts of a flowering plant.	Thrive and Survive Explore and investigate nutrition in plants and animals	Reproduction Explore the function of the flower in pollination and seed dispersal	Properties/changing materials Compare rocks and soils and describe fossil formation
Big Question	**How can we control light?**	**How do forces affect objects?**	**How do some plants and animals and plants stand up?**	**What do plants and animals need to thrive and survive?**	**How do flowering plants reproduce?**	**How do rocks and soils change?**
National Curriculum – Substantive	• 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 •	• 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 • notice that some forces need contact between 2 objects • compare how things move on different surfaces	**animals** • identify that humans and some other animals have skeletons and muscles for support, protection and movement Plants • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers •	Animals • 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 Plants • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant • 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	Rocks and Soils • 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
Essential knowledge	• Know that light is needed to see things • Know that dark is the absence of light. • Know that light reflected from surfaces. • Know that looking directly at the sun is dangerous. • Know that an opaque object blocks light. • Know that shadows are forms when light is blocked. • Know that translucent materials allow light through. • Know that the closer an object to the light source the larger the shadow.	• Know that forces describe how objects affect each other. • Know a force is active power • Know that magnetic forces can act at a distance • Know that magnets can attract and repel each other and that these are forces. • Know that some materials are attracted to magnets • Know that metals (except aluminium) are magnetic. • Know that magnets have a north and south pole. • Know that like poles repel and opposite poles attract. • To know that things move further on smoother surfaces. • To know that some forces need contact between two objects.	• Know that humans and animals have skeletons to: ○ protect their vital organs ○ support the structure of their body ○ allow movement • Know that humans and animals have muscles which work in pairs to allow movement • Know that a stem/trunk provides support and transport water • Know that the leaf captures energy from the sun. • Know that flowers attract insects.	• Know the role of carbohydrate, protein, fats and vegetables in maintaining a balanced of diet. • Know that nutrition provides the body with energy. • Know that animals need to source food from another animals or plant. • Know that plants need nutrients from the soil and room to grow • Know that different plants need different conditions • Know that water is transported in plants from the roots to the stem and excreted through the leaves.	• Know that plants mature and create flowers and seeds • Know that the flower attracts pollinators. • Know that pollinators carry pollen from one plant to another causing pollination to occur. • Know that a seed forms as a result of pollination • Know that seeds disperse by wind, explosion, animals and water. • Know that seeds disperse to find room to grow new plants.	• Know that rocks can be grouped based on what they look like and how they feel. • Know that different rocks have different properties. • Know that fossils are found in sedimentary roc ks • Know that sedimentary rocks are formed of layers. • Know that a fossil is the imprint of something that was once living (plants/animals) • Know that the fossil is the imprint of the hardest material in the living thing • Know that fossils are formed when things that have lived are trapped in layers of rock • Know that organic matter is the remains of something that was once living • When organic matter is subjected to large forces (squashed) it forms a soil
Generalisation	*The sun is the main source of heat energy and light energy on earth.* Light travels from a source to an object and can be controlled by changing the journey. Light (energy) gives us the capacity to see (work)	*Materials have properties (structure) which allow them to do different things (function),* this includes being magnetic. Forces describe how contacting and non-contacting objects affect each other. Magnetic forces affect objects at a distance.	Animals and plants have different parts (structure) which enable the 7 life processes (functions). NUTRITION MOVEMENT GROWTH EXCRETION	Animals and plants need nutrition (energy supply and materials from different food types) to survive and grow (function / work). Living things are healthy (thrive) when they have the right conditions. Different food types provide different nutrition as they have different structure and function.	Plants have different parts (structure) which enables the function of reproduction. This allows the species to continue.	Materials and living things have properties which allow them to do different things (structure and function). These vary and help us to identify what type of material it is. Forces describe how objects affect each other. Forces on materials can cause them to change their appearance and properties (structure and function)

Disciplinary Knowledge	**Observing and measuring** • I know that I observe / measure the dependent variable. • I know that a dependent variable is the variable that is changing • I know that systematic observation is one that is controlled. **Asking and exploring Questions** • I know there are different types of scientific enquires. • I know that comparative and fair testing involves exploring cause and effect. • I can identify the control and dependent variables • I can recognise a fair test **Applications** • I can name an application of science and an associated scientist)	**Observing and Measuring** • *I know that systematic observation is one that is controlled.* • I know that force is measures in N using a Newton meter **Asking and exploring Questions** • *I know there are different types of scientific enquires.* • *I know that comparative and fair testing involves exploring cause and effect.* • *I can identify the control and dependent variables* • *I can recognise a fair test* **Recording Data** • I know that the control variable builds the table • I know that the dependent variable data is organised in a table. **Concluding, prediction, evaluating** • I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. **Applications** • I can name an application of science and an associated scientist)	**Recording Data** • I know that the control variable builds the x axis • I know that the dependent variable data is organised on the y axis • I can label and identify features I have observed • I know that a diagram is simplified and contains key features. **Asking and exploring Questions** • I know that researching involves using secondary sources to find answers to questions • I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. **Concluding, prediction, evaluating** • I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. • I know how to use the relationship (cause and effect) or pattern to predict a future change	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Asking and exploring Questions** • I know that classifying involves sorting and grouping according to similarities and differences. • I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Communicating** • I know relevant scientific language and can use that language to discuss and present my ideas	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Asking and exploring Questions** • I know that classifying involves sorting and grouping according to similarities and differences. • I know and give reasons for my choice of enquiry • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** • I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Communicating** • I know relevant scientific language and can use that language to discuss and present my ideas	**Asking and exploring Questions** • I know and give reasons for my choice of enquiry • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Applications** • I can name an application of science and an associated scientist **Communicating** I know relevant scientific language and can use that language to discuss and present my ideas
Sign p	• Plymouth: Year 3 Science Unit Light	• Plymouth: Year 3 Science Unit Forces and Magnets.	• Plymouth: Year 3 Science Unit Animals Including Humans and Plants	• Plymouth: Year 3 Science Unit Animals Including Humans and Plants	• Plymouth: Year 3 Science Unit Plants	• Plymouth: Year 3 Science Unit Rocks

Year 4

Main concepts	Properties/changing materials Observe and measure changes of state	Energy – Sound Explore how sound energy travels in vibration waves	Alive (Structure and Function) Identify the structure and function of different parts of the digestive system (including teeth)	Diversity Use knowledge of structure of plants and animals to group them	Thrive and Survive Construct food chains and reason about the impact of environmental change on thrive and survive	Energy - Electricity Explore the impact of an open and closed circuit on electrical energy?
Big Question	**How can the state of materials change?**	**How do we control sound?**	**What is the function of the digestive system?**	**How can we classify different plants and animals?**	**Why are food chains important?**	**How does electricity travel?**
National Curriculum – Substantive	• 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 •	• 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	• 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 •	• 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 o-f living things in their local and wider environment •	• Food chains recognise that environments can change and that this can sometimes pose dangers to living things construct and interpret a variety of food chains, identifying producers, predators and prey •	• 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
Essential knowledge	• Know that materials are made from matter. • Matter is the building blocks of everything. • Know that the three states of matter are solids, liquid and gas. • Know that a solid is a substance that holds its shape. • Know that liquids form a pool not a pile. • Know that gas escape from an unsealed container. • Know that temperature is a measure of the amount of heat (Celsius) • Know that some materials change state when they are heated or cooled • Know that melting is when a solid changes to a liquid and that freezing is when a liquid changes to a solid • Know that materials all have a melting and freezing point • Know that water freezes at 0 degrees and evaporates at 100 • Know that evaporation is when a liquid changes to a gas and that condensation is when a gas changes to a liquid • Know that the sun's thermal energy evaporates water from the earth's surface. • Know that the water held in clouds cools and condensates back to earth as rain / snow.	• To know that sound is a form of energy. • To know that sound occurs due to an object vibrating. • To know that the vibrations of sound travel through solids, liquids and gases to the ear. • To know that the speed of the vibrations changed the pitch. A high-speed vibration causes a higher pitch. • To know that strength of a vibrations causes a louder volume. • To know that a sound gets fainter as the distance from the sound source increases.	• Know that teeth break down food into small swallowable pieces. • Know the function of the molars is to grind food. • Know the function of the canines is to rip food • Know the function of the incisors is to cut food. • Know the oesophagus transports chewed food and liquid to the stomach • Know that the stomach breaks down the chewed food into a liquid • Know that the small intestine allows nutrients to be absorbed into the body. • Know that the function of the large intestine is to absorb water. • Know that the anus allows the body to store and excrete waste	• Classify plants in flowering and non-flowering plants • Classify vertebrates into fish, amphibians, birds, fish and mammals • Classify non-vertebrates into insects, arachnids, molluscs. • Know invertebrates are animals which do not have a backbone, vertebrates do. • Know that a classification key is a tool for identifying and grouping based on differences	• Know that a food chain starts with a producer • Know that a food chain includes predators who feed on prey. • Construct a food chain containing producers predators and prey • Know that environmental change can endanger living things in a habitat e.g. …	• To know some common appliances that run on electricity. • To know the basic parts of a circuit: bulb, cells, switch wire buzzer. • To Know that a complete circuit is needed to power a component. • To know the impact of a complete and open circuit • To know that a switch completes and opens a circuit. • To know that electrical insulators do not allow electricity to flow through them. • To know that electrical conductors do allow electricity to flow through them. • To know that metal make good conductors. • To know that a series circuit contains elements in a single complete loop

Generalisation	*Materials have properties (**structure**) which enables **function** and therefore a use.* Materials are made from matter. Matter can be structured as solid, liquid or gas. Changing the thermal energy (heating, cooling) can cause a change of state (work done)	Sound (energy) gives us the capacity to hear / feel (work done). Sound travels in waves through a medium from a source vibrating to a receiver.	Animals and plants need nutrition (energy) to survive and thrive (function / work done). The supply of energy (food) travels through digestive system, where different structures perform different functions (work done) allowing the body to survive and thrive.	*The structure and function of living things and materials have similarities and differences. These enable us to group them and identify individual* diversity in species (types).	Animals and plants need nutrition (energy) to survive and thrive (function / work done). Food chains show how energy travels from one source to another.	Electricity (energy) travels in a circuit from the power source to the component to make it work (work done) *Materials have properties (**structure**) which enables **function** and therefore a use,* e.g. electrical conductors and insulators, this impacts the work done.
	Observing and measuring • I know that I observe / measure the dependent variable. • I know that a dependent variable is the variable that is changing • I know that systematic observation is one that is controlled. **Asking and exploring Questions** • I know there are different types of scientific enquires. • I know that comparative and fair testing involves exploring cause and effect. • I can identify the control and dependent variables • I can recognise a fair test **Applications** • I can name an application of science and an associated scientist) •	**Observing and Measuring** • *I know that systematic observation is one that is controlled.* • I know that sound is measure in decibels using dataloggers. **Asking and exploring Questions** • *I know there are different types of scientific enquires.* • *I know that comparative and fair testing involves exploring cause and effect.* • *I can identify the control and dependent variables* • *I can recognise a fair test* **Recording Data** • I know that the control variable builds the table • I know that the dependent variable data is organised in a table. **Concluding, prediction, evaluating** • I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. **Applications** • I can name an application of science and an associated scientist)	**Recording Data** • I know that the control variable builds the x axis • I know that the dependent variable data is organised on the y axis • I can label and identify features I have observed • I know that a diagram is simplified and contains key features. **Asking and exploring Questions** • I know that researching involves using secondary sources to find answers to questions • I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. **Concluding, prediction, evaluating** • I know how to use tables and bar charts to look for patterns and relationships (cause and effect) and describe these in words. • I know how to use the relationship (cause and effect) or pattern to predict a future change	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Asking and exploring Questions** • I know that classifying involves sorting and grouping according to similarities and differences. • I know that 'observations over time' focus on similarities and differences, patterns and change at regular intervals. • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Communicating** • I know relevant scientific language and can use that language to discuss and present my ideas	**Recording Data** • I know how to use my careful observations in a given simple key to identify **Asking and exploring Questions** • I know that classifying involves sorting and grouping according to similarities and differences. • I know and give reasons for my choice of enquiry • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** • I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Communicating** • I know relevant scientific language and can use that language to discuss and present my ideas	**Asking and exploring Questions** • I know and give reasons for my choice of enquiry • I know that my question is based on my variables • I can identify the control and dependent variables **Performing Tests** I can make suggestions as to how to investigate **Concluding, prediction, evaluating** • I know how to describe the similarities and differences or changes in my data • I know how to use the relationship (cause and effect) or pattern to predict a future change • I can use my scientific knowledge to explain my findings **Applications** • I can name an application of science and an associated scientist **Communicating** • I know relevant scientific language and can use that language to discuss and present my ideas
Vehicle signpost	• Plymouth- Year 4 changing state	• Plymouth- year 4 sound	• Plymouth- year 4 animals including humans (I1,2,	• Plymouth- year 4 living things and habitats	• Plymouth- year 4 animals including humans (I5) and living things and habitats	• Plymouth- Year 4 electricity

Year 5

Main concepts	Properties/changing materials Explain the processes and outcomes of some reversible and irreversible changes which include changes of state.	Forces: contact & non-contact Identify and explain the effects of unbalanced forces	Forces: contact & non-contact Describe the orbits of the earth and moon	Alive (Structure and Function) Describe how human structure and function changes as they age.	Reproduction Describe and compare the process of sexual reproduction in some animals	Reproduction Describe and compare the process of sexual and asexual reproduction in some plants.
Big Question	**Are all changes to materials irreversible?**	**How can forces cause a change in an object's movement?**	**How do forces impact planets and moons?**	**How does the structure and function of animals change as they grow?**	**How do different types of animals reproduce?**	**How do different types of plants reproduce?**
National Curriculum – Substantive	• compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	• 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.	• 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. •	• describe the changes as humans develop to old age •	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some animals •	• describe the life process of reproduction in some plants
Essential knowledge	• Know that materials that do not easily change when forces are applied are hard. • Know that materials that allow heat in the form of thermal energy or electrical energy to flow through are conductors. • Know that materials that restrict the flow of energy are called insulators. • To know that some materials are magnetic. • To know that the greater the transparency of the material the more light it lets through. • Know that soluble materials (substance) are able to be dissolved in a liquid. • Know that a solution contains a liquid and a soluble material. • Know that you can recover a substance from a solution by evaporating off the liquid • Know that some changes are reversible • Know that some changes are irreversible as a new material is formed. • Know that burning a substance is an irreversible change • Know that mixtures can be separated in different ways, including filtering, sieving, and evaporating • Know that chemical changes which involve acids are irreversible	• To know that friction is a force acting between two surfaces • To know that friction tries to slow things down or halt them. • To know that the same object will move differently on different surfaces. • To know that water resistance is the force acting between an object and body of water. • To know that air-resistance is the force acting between an object and a body of air.	• Know that gravity is an attractive force which causes unsupported objects fall to earth. • Know that sun is the centre of our solar system. • Know that the sun's gravitational force cause the planets to orbit it. • Know that the moon orbits the earth. • Know that the moon appears differently in the night sky at different points in its orbit. • Know that the time between two full moons is an orbit cycle. • Know that sun is a star. • Name the eight planets in the solar system. • Know that the sun, earth and moon are approximately spheres. • Know that earth spins on its axis. • Know that one spin is 24 hours • Know that this causes the surface of the earth to face towards the sun in the day time and away from the sun at night. • Know that the Earth rotation makes it appear as if the sun is moving across the sky.	• Know that babies are dependent upon an adult • Know that a toddler can move around their world. • Know that children grow rapidly • Know that adolescents experience puberty which enables them to reproduce • Know that adults are fully grown human • Know as humans age, their bodies begin to change	• Know the life cycle of a mammal (human) • Know that mammals require sperm from a male to fertilise an ovary from a female. • Know that a fertilised egg grows in the female's uterus until the offspring is ready to be born. • Know that a bird's embryo is grown outside of the female within a protective egg, until it is ready to be hatched. • Know that an amphibian's embryo is laid as soft spawn in water until they are ready to hatch. • Know that amphibian offspring undergo metamorphosis into a mature adult. • Know that insects have four stages within their life cycles – egg lava, pupa and adult.	• Know that plants that reproduce sexually need pollen from a male and female plant. • Know that asexual plants do not require male and female pollen and therefore do not have flowers. • Know that seeds germinate and grow into mature plants •

Generalisation	*Materials have properties (**structure**) which enables **function** and therefore a use,* e.g. thermal conductors and insulators. *Materials are made from matter.* *Matter can be structured as solid, liquid or gas.* *Changing the thermal energy (heating, cooling) can cause a change of state (work done)* If you change the material's properties through mixing (structure) you change its use (function). Mixing materials can change structure and function. Changes are either reversible or irreversible.	*Materials have properties (structure) which allow them to do different things (function),* this includes being magnetic. Forces describe how contacting and non-contacting objects affect each other. An unbalanced force causes a change in movement e.g. resistance.	Forces describe how contacting and non-contacting objects affect each other. An unbalanced force causes a change in movement e.g. gravity. Forces in balance maintain their movement, e.g. orbit.	Adult animal (humans) offspring do not always have the same structure and function as their parents but do grow into the same type of adult (species). As animals (humans) grow, their structure and function develops and changes (stages / ages) enabling reproduction after a certain age. (link to safeguarding / SRE curriculum)	Animals have different parts (structure) which enables the function of reproduction. This allows the species to thrive and survive. As animals grow, their structure and function develops and changes (stages / ages) enabling reproduction after a certain age. (link to safeguarding / SRE curriculum)	*Plants have different parts (structure) which enables the function of reproduction. This allows the species to thrive and survive.* As plants grow, their structure and function develops and changes (stages) enabling reproduction after a certain stage.
	Observing and measuring • I use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. • I know that systematic observation is based on the control variable **Recording Data** • I know that a line graph represents changes over time. • I know that the x axis is the control variable • I know that the y axis is the dependent variable **Asking and exploring questions** • I can identify how to control variables in different enquiry types - I can design a fair test **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. **Communicating** • I know that relevant scientific language and illustrations can be used to communicate and justify my ideas **Applications** • I can use my knowledge of science to understand its uses and implication •	**Observing and measuring** • I know that repeating measurements and observations increases their reliability **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. • I can design a fair test **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I can use my scientific knowledge to question my findings and decide when further testing is required.	**Observing and measuring** • I use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. • I can design a fair test **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I know that all results allow me to question and predict, however, not all results are reliable **Communicating** • I know how scientific ideas have developed over time.	**Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. • I can explain my choice of enquiry choice **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know that a line graph represents changes over time. • I know that the x axis is the control variable • I know that the y axis is the dependent variable **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. • I can use my scientific knowledge to question my findings and decide when further testing is required. • I know that all results allow me to question and predict, however, not all results are reliable	**Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. • I can explain my choice of enquiry choice **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. • I know that a line graph represents changes over time. • I know that the x axis is the control variable • I know that the y axis is the dependent variable **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave.	**Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. • I can explain my choice of enquiry choice **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. • I can use my scientific knowledge to question my findings and decide when further testing is required. • I know that all results allow me to question and predict, however, not all results are reliable
Vehicle sign post	• Plymouth: Year 5 Science Unit Properties of Materials	• Plymouth: Year 5 Science Unit Forces	• Plymouth: Year 5 Science Unit Space	• Plymouth: Year 5 Science Unit Living things and habitats	• Plymouth: Year 5 Science Unit Living Things and Habitats	• Plymouth: Year 5 Science Unit Living Things and Habitats

Year 6

Main concepts	Alive (Structure and Function) Identify the structure and function of main different parts of the human circulatory system	Alive (Structure and Function) Use knowledge of structure and function of plants and animals to classify them in broad groups	Diversity Recognise ways in which humans can support or hinder their ability to thrive. Identify adaptions and its role in evolution		Energy - Light Explore how light energy travels in straight lines.	Energy – Electricity Explore the impact of varying voltage in a circuit
Big Question	**How can I enable my body to thrive?**	**How does classification help us identify species?**	**How have adaptations helped living things to thrive and survive?**		**How does light allow us to see?**	**How can we control electricity?**

National Curriculum – Substantive	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • describe the ways in which nutrients and water are transported within animals, including humans • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function •	Animals • 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.	• Plants and animals 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.	•	• 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.	• 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. •
Essential knowledge	• Know that the function of the heart is to pump blood around the body. • Know that the function of the lungs is to bring oxygen into the body and excrete carbon dioxide • Know that carbon dioxide is waste product • Know that blood vessels transport the blood to all areas of the body. • Know that blood carries oxygen, CO2, water and nutrients. • Know that an unbalanced diet leads to poor health • Know that exercise leads to greater well-being both physically and mentally • Know that some drugs can be harmful to the human body, e.g. ……	• Know the difference between a plant, micro-organisms and an animal • Know that a microorganism is a bacteria or a virus that can be helpful or harmful • Know the difference between flowering plants and non-flowering plants • Know the difference between vertebrates and invertebrates • Know the 5 classifications of vertebrates: mammals, birds, fish, amphibians and reptiles. • Know that invertebrates can be worms, insects and spiders • 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.	• Know that animal offspring are similar to, but not identical to their parents. • Know that fossils are evidence of the plants and animals alive millions of years ago. • Know that characteristics are passed to offspring from their mother and father. • Know that animals and plants have characteristics that are suited to the habitat in which they live. • Know that overtime, animals and plants adapt to suit their environment. • Know that adaptations can be passed from offspring to offspring over many years. • Know that adaptations passed through many offspring result in permanent change which is called evolution.	•	• To know that light appears to travel in straight lines • To know that light can travel directly to the eye. • To know that light can travels from a source to an object and then to the eye. • To know that light can be reflected into the eye. • To know that shadows are the same shape as objects as light travels in straight lines.	• To know that voltage is an electrical force. • To know that the more volts the bright / louder the component. • To know that a cell is 1.5v • To know that a battery is multiple cells. • To know that in a circuit with a fixed voltage, the more components the quieter, dimmer the component. • To know the recognised circuit symbols for switch, cell, bulb, buzzer and switch.
Generalisation	The body needs oxygen, water and nutrients to function (survive). These travel through the circulatory system where different parts (structures) perform different functions. Lifestyle choices can affect the way the body functions.	The structure and function (characteristics) of living things have similarities and differences. These enable us to classify them into species and identify diversity within species.	Over time species evolve, adapting their structure and functions to better suit their habitats. They develop characteristics that help them to improve their species ability to survive and thrive through generations.		Light appears to travel in straight lines from a source to an object to receiver (eye). Pathways of light can be changed through blocking it or reflecting it.	*Electricity (energy) travels in a circuit from the power source to the component to make it work (work done)* *Materials have properties (**structure**) which enables **function** and therefore a use, e.g. electrical conductors and insulators, this impacts the work done.* Varying the components and voltage in a circuit affects the amount of work done.

	Observing and measuring • I use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. • I know that systematic observation is based on the control variable • I know that repeating measurements and observations increases their reliability **Recording Data** • I know that a line graph represents changes over time. • I know that the x axis is the control variable • I know that the y axis is the dependent variable **Asking and exploring questions** • I can identify how to control variables in different enquiry types - I can design a fair test **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. • I know that all results allow me to question and predict, however, not all results are reliable **Applications** • I can use my knowledge of science to understand its uses and implication	**Observing and measuring** **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to use yes no answers to build a classification key **Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I can use my scientific knowledge to question my findings and decide when further testing is required. **Communicating** • I know that relevant scientific language and illustrations can be used to communicate and justify my ideas	**Observing and measuring** • I use my knowledge of variables and measures to make reasoned decisions about what to observe and measure and which equipment to use. **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Asking and exploring questions** • I know how to use variables to generate an enquiry question for different enquiry types. **Performing Tests** • I can plan and perform part of an investigation independently **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. **Communicating** • I know how scientific ideas have developed over time. **Applications** • I can use my knowledge of science to understand its uses and implication		**Asking and exploring questions** • I can identify how to control variables in different enquiry types - I can design a fair test • I know how to use variables to generate an enquiry question for different enquiry types. • I can explain my choice of enquiry choice **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. • I know that all results allow me to question and predict, however, not all results are reliable • I can use my scientific knowledge to question my findings and decide when further testing is required **Communicating** • I know that relevant scientific language and illustrations can be used to communicate and justify my ideas • I know how scientific ideas have developed over time. **Applications** • I can use my knowledge of science to understand its uses and implication •	**Asking and exploring questions** • I can identify how to control variables in different enquiry types - I can design a fair test • I know how to use variables to generate an enquiry question for different enquiry types. • I can explain my choice of enquiry choice **Recording Data** • I know that scientific diagrams mainly contain labelled features relevant to the variables • I know how to organise data using my knowledge of control and dependent variables in tables, charts and diagrams. **Concluding, prediction, evaluating** • I know that predictions are based on my scientific knowledge of how variables are likely to behave. • I can use my scientific knowledge to question my findings and decide when further testing is required. • I know that all results allow me to question and predict, however, not all results are reliable **Communicating** • I know that relevant scientific language and illustrations can be used to communicate and justify my ideas • I know how scientific ideas have developed over time. **Applications** • I can use my knowledge of science to understand its uses and implication •
Vehicle signpost	• Plymouth: Year 6 Science Unit Animals including humans	• Plymouth: Year 6 Science Unit Living Things and Habitats	• Plymouth: Year 6 Science Unit AND Evolution and inheritance		• Plymouth: Year 6 Science Unit Light	• Plymouth: Year 6 Science Unit Electricity