

Sycamore Year B Autumn 1 (and 2 - sound)	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	<p>By Sycamore they know what different animals eat but they have not yet thought about teeth. They know how to look after their teeth.</p> <p>They will have a good understanding of pitch and volume because of their music lessons.</p>	<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 	<p>These will not be taught explicitly again until KS3:</p> <p>Sound</p> <p>Frequencies of sound waves, measured in hertz (hz); echoes, reflection and absorption of sound</p> <p>Sound needs a medium to travel, the speed of sound in air, in water, in solids</p> <p>Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal auditory range of humans and animals.</p>
Disciplinary Knowledge		<p>Animals inc humans teeth (Year 4)</p> <ul style="list-style-type: none"> • Identify the different types of teeth in humans and their simple functions <p>Sound stringed instruments (year 4)</p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <ul style="list-style-type: none"> • 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 	<p>Teeth is not explicitly in the KS3 areas of study</p>
VOCAB		<p>Canine, incisor, molar vibration, wave, volume, pitch, tone, insulation</p>	
Learning Objective			<ol style="list-style-type: none"> 1. To identify different teeth in humans 2. To identify teeth in different animals (Comparing the teeth of carnivores and herbivores and suggesting reasons for differences; finding out what damages teeth and how to look after them.) 3. To know how we hear sounds 4. To find patterns between the pitch of a sound and features of the object that produced it 5. To find patterns between the volume of a sound and the strength of the vibrations that produced it 6. To recognise that sounds get fainter as the distance from the sound source increases <p><i>Finding patterns in the sounds that are made by different objects such as elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.</i></p>

Sycamore Year B Autumn 2 continued	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	<p>In Maple and Willow Living things and their habitats year 2 – use diff animals and micro habitats to Maple Class</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. • Identifying scientific evidence that has been used to support or refute ideas or arguments 	<p>In Oak: Living things and their habitats Plants (Year 6)</p> <ul style="list-style-type: none"> • 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
Disciplinary Knowledge	<ul style="list-style-type: none"> • Identify and name a variety of plants and animals in their habitats, including micro-habitats • 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. 	<p>Habitats (year 5)</p> <ul style="list-style-type: none"> • 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. 	
VOCAB		<p>life process, reproduction, offspring, characteristic, classification, organism, micro-organism</p>	
Learning Objective	<ol style="list-style-type: none"> 1. To know the life cycle of a mammal and an amphibian 2. To know the life cycle of an insect and of a bird 3. To describe the life process of reproduction in some animals*<i>check this one (RHE)</i> <p><i>Observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences. They might try to grow new plants from different parts of the parent plant, for example, seeds, stem and root cuttings, tubers, bulbs. They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow</i></p>		

Sycamore Year B Spring 1	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	<p>In Willow:</p> <ul style="list-style-type: none"> 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. 	<ul style="list-style-type: none"> Asking relevant questions and using different types of scientific enquiries to answer them Setting up simple practical enquiries, comparative and fair tests Making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Identifying differences, similarities or changes related to simple scientific ideas and processes Using straightforward scientific evidence to answer questions or to support their findings Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 	<p>In Oak they will go onto look at light and electricity so states of matters and properties of materials will not be covered until KS3:</p> <p>Physical changes</p> <ul style="list-style-type: none"> conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving similarities and differences, including density differences, between solids, liquids and gases Brownian motion in gases diffusion in liquids and gases driven by differences in concentration the difference between chemical and physical changes. <p>Properties of materials</p> <ul style="list-style-type: none"> the order of metals and carbon in the reactivity series the use of carbon in obtaining metals from metal oxides properties of ceramics, polymers and composites (qualitative)
Disciplinary Knowledge		<p>States of matter (year 4) Properties of materials (year 5) Evaporating filtering Burning Spencer Silver,</p> <ul style="list-style-type: none"> 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. 	
VOCAB		<p>Solid, liquid, gas, evaporation, condensation, particle, temperature, dissolve rust reversible irreversible</p>	
Learning Objective	<ol style="list-style-type: none"> To know who Spencer Silver was To understand what solids, liquids and gases are (Grouping and classifying a variety of different materials) To observe that some materials change state when they are heated or cooled To observe evaporation and to know the temperature this happens at (They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.) To observe and compare changes that take place when burning (They could observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes. They might research and discuss how chemical changes have an impact on our lives, for example, cooking) To understand the parts of evaporation and condensation in the water cycle 		

Sycamore Year B Spring 2	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	Electricity is not covered until year 4	<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Setting up simple practical enquiries, comparative and fair tests • Making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. 	<p>In Oak:</p> <ul style="list-style-type: none"> • 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.
Disciplinary Knowledge		<p>Electricity light bulbs</p> <ul style="list-style-type: none"> • 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. 	
VOCAB		Appliance, battery power, main power, circuit, series, cell, battery, wire, bulb, switch, break in circuit conductor, insulator	
Learning Objective	<ol style="list-style-type: none"> 1. To identify common appliances that run on electricity 2. To identify and name the basic parts of a series circuit 3. To construct a simple series electrical circuit (Observing patterns, for example, that bulbs get brighter if more cells are added) 4. To identify if a circuit is complete or not (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) 5. To understand the role of a switch in a circuit (Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit They might compare materials in order to make a switch in a circuit) 6. To recognise some common conductors and insulators (associate metals with being good conductors) 		

Sycamore Year B Summer 1	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	Earth and space is not covered before year 5. Forces is covered in o/ws:	<ul style="list-style-type: none"> Identifying scientific evidence that has been used to support or refute ideas or arguments 	Neither subject is covered again until KS3:
Disciplinary Knowledge	Forces and magnets year 3 <ul style="list-style-type: none"> Compare how things move on different surfaces Notice that some forces need contact between two objects, but magnetic forces can act at a distance Observe how magnets attract or repel each other and attract some materials and not others Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing. 	Earth and space (Year 5) +forces Day and night Ext make shadow clocks / sundial- Ext moons on other planets- Ext research Ptolemy <ul style="list-style-type: none"> 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. 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 	gravity force, weight = mass x gravitational field strength (g), on Earth $g=10 \text{ N/kg}$, different on other planets and stars; gravity forces between Earth and Moon, and between Earth and Sun (qualitative only) our Sun as a star, other stars in our galaxy, other galaxies the seasons and the Earth's tilt, day length at different times of year, in different hemispheres the light year as a unit of astronomical distance
VOCAB		Earth, sun, moon, solar system, axis of rotation, day, night, phases of the moon, star, constellation, gravity, friction, water resistance, air resistance	
Learning Objective			<ol style="list-style-type: none"> To describe the movement of the Earth, and other planets, relative to the Sun in the solar system <i>creating simple models of the solar system</i> To describe the movement of the Moon relative to the Earth To describe the Sun, Earth and Moon as approximately spherical bodies To understand how day and night occurs (use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky) <i>Comparing the time of day at different places on the Earth through internet links and direct communication constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day; finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</i> To understand gravity (explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object) To identify the effects of air resistance, water resistance and friction, that act between moving surfaces

Sycamore Year B - Summer 2	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	<p>In Willow:</p> <ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Making systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings 	<p>In Oak:</p> <ul style="list-style-type: none"> • 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
Disciplinary Knowledge	<ul style="list-style-type: none"> • Identify and name a variety of plants and animals in their habitats, including micro-habitats • 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. 	<p>Living things and their habitats, classify plant Effects of ecology parks and deforestation Year 4</p> <ul style="list-style-type: none"> • Construct and interpret a variety of food chains, identifying producers, predators and prey. • Recognise that living things can be grouped in a variety of ways • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment • Recognise that environments can change and that this can sometimes pose dangers to living things. 	
VOCAB		Environment, habitat, classification key kingdom domain species	
Learning Objective	<p>1-To interpret and construct food chains in our local environment</p> <p>2-To identify how environments might change and the effects of this (<i>deforestation, building new houses etc</i>).</p> <p>3-To group animals in a variety of different ways (<i>habitat, food, predator/prey, species etc.</i>)</p> <p>4-To explore and use classification keys</p> <p>5-To classify plants in our school grounds (<i>Using and making simple guides or keys to explore and identify local animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</i>)- field</p> <p>6-To classify plants in our school grounds (<i>Using and making simple guides or keys to explore and identify local animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.</i>)- forest school</p>		

