<table>
<tr><td>Sycamore Year A Autumn 1</td><td>Prior Knowledge</td><td>Knowledge to be explicitly taught</td><td>How the knowledge will be built on</td></tr>
<tr><td>Substantive Knowledge</td><td rowspan="3">In Willow
• 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 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.</td><td>Plan different types of scientific enquires to answer given questions decided together.
Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment e.g.
Group and classify things and recognise patterns using appropriate ways of presenting e.g. classification keys template plants/ animals</td><td rowspan="3">In Oak:
• 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</td></tr>
<tr><td>Disciplinary Knowledge</td><td>Living things and their habitats, classify plant Effects of ecology parks and deforestation Year 4
• 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.</td></tr>
<tr><td>VOCAB</td><td>Environment, habitat, classification key kingdom species seed spore predator prey producer consumer</td></tr>
<tr><td>Learning Objective</td><td colspan="3">To interpret and construct food chains in our local environment
To identify how environments might change and the effects of this (deforestation, building new houses etc).
To group animals in a variety of different ways (habitat, food, predator/prey, species etc.)
To explore and use classification keys
To classify plants in our school grounds (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.)- field
To classify plants in our school grounds (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.)- forest school</td></tr>
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<tr><td>Sycamore Year A
Autumn 2</td><td>Prior Knowledge</td><td>Knowledge to be explicitly taught</td><td>How the knowledge will be built on</td></tr>
<tr><td>Substantive Knowledge</td><td rowspan="3">Neither of these topics are covered before.
This may be mentioned in music.</td><td>Plan different types of scientific enquires to answer given questions decided together.</td><td rowspan="3">This will next be built on in secondary school</td></tr>
<tr><td>Disciplinary Knowledge</td><td>Digestive system (Year 4)
• Describe the simple functions of the basic parts of the digestive system in humans

Sound wind instruments (Year 4)
• 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</td></tr>
<tr><td>VOCAB</td><td>vibration, wave, volume, pitch, tone, insulation
oesophagus, stomach, small intestine, large intestine, nutrients, absorb
Describe the simple functions of the basic parts of the digestive system in humans</td></tr>
<tr><td>Learning Objective</td><td colspan="3">1. LO: to describe the simple functions of the basic parts of the digestive system in humans
2. LO: to identify how sounds are made, associating some of them with something vibrating
3. LO: to recognise that vibrations from sounds travel through a medium to the ear
4. LO: to find patterns between the pitch of a sound and features of the object that produced it
5. LO: to find patterns between the volume of a sound and the strength of the vibrations that produced it
6. LO: to recognise that sounds get fainter as the distance from the sound source increases</td></tr>
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Sycamore Year A Spring 1	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	Electricity is not covered until year 4	Set up an enquiry based investigation when it is appropriate e.g. Which of two instruments make the highest or lowest sound and does a glass of ice weigh more than a glass of water. Set up a fair test with more than one variable e.g. using different materials to cut out sound. Can explain to others why a test is fair Begin to suggest improvements to my method and give reasons. To make predictions drawing on scientific knowledge as evidence e.g. I think the bulb will be brighter with the paperclip because it is made of metal just like the wire. Plan different types of scientific enquires to answer given questions decided together. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment Gather, record, classify and present data in a variety of ways to help in answering questions drawings, labelled diagrams, classification keys, and child constructed bar charts and tables. To recognise where secondary sources are reliable Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Use more than 1 piece of scientific evidence to answer questions or to support findings.	In Oak: • 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		Electricity buzzers • 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	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 buzzer bets louder 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 A Spring 2	Prior Knowledge	Knowledge to be explicitly taught	How the knowledge will be built on
Substantive Knowledge	In Willow: • 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.	Set up an enquiry based investigation when it is appropriate e.g. Which of two instruments make the highest or lowest sound and does a glass of ice weigh more than a glass of water. Set up a fair test with more than one variable e.g. using different materials to cut out sound. Can explain to others why a test is fair Begin to suggest improvements to my method and give reasons. To make predictions drawing on scientific knowledge as evidence e.g. I think the bulb will be brighter with the paperclip because it is made of metal just like the wire. Plan different types of scientific enquires to answer given questions decided together. Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment Gather, record, classify and present data in a variety of ways to help in answering questions drawings, labelled diagrams, classification keys, and child constructed bar charts and tables. To recognise where secondary sources are reliable Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions Use more than 1 piece of scientific evidence to answer questions or to support findings.	In Oak Class they will go onto look at light and electricity so states of matters and properties of materials will not be covered until KS3: Physical changes ♣ 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. Properties of materials ♣ 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		States of matter (Year 4) Properties of materials (Year 5) Melting sieving Dissolving Rusting Compare and gp materials Ruth Benerito • 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		Solid, liquid, gas, evaporation, condensation, particle, temperature, dissolve rust reversible irreversible	
Learning Objective	1. To know who Ruth Benerito was 2. To understand what solids, liquids and gases are (Grouping and classifying a variety of different materials) 3. To observe that some materials change state when they are heated or cooled 4. To observe melting and to know the temperature this happens at 5. To observe and compare changes that take place when dissolving 6. To understand the parts of evaporation and condensation in the water cycle		

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<tr><td>Substantive Knowledge</td><td rowspan="3">Plants year 2 – what plants need to grow how seeds grow into plants
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.</td><td>Plan different types of scientific enquires to answer given questions decided together.
Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment e.g.
Group and classify things and recognise patterns using appropriate ways of presenting e.g. classification keys template plants/ animals</td><td rowspan="3">Living things and their habitats, classify plant Effects of ecology parks and deforestation Year 4
• 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.</td></tr>
<tr><td>Disciplinary Knowledge</td><td>Plants year 3 – review year 1 and 2 learning. How water is transported, seeds.
Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
• Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant
• Investigate the way in which water is transported within plants
• Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</td></tr>
<tr><td>VOCAB</td><td>air, water, transportation, nutrients, soil, reproduction, seed formation, seed dispersal, pollination environment,</td></tr>
<tr><td>Learning Objective</td><td colspan="3">1. LO: to know how water is transported, seeds.
2. LO: to identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
3. LO: to 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
4. LO: to investigate the way in which water is transported within plants
5. LO: to explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.
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<tr><td>Substantive Knowledge</td><td rowspan="3">Earth and space is not covered before year 5. Forces is covered in owls:
Forces and magnets year 3
• 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.</td><td>Plan different types of scientific enquires to answer given questions decided together.</td><td rowspan="3">Neither subject is covered again until KS3:
gravity force, weight = mass x gravitational field strength (g), on Earth g=10 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</td></tr>
<tr><td>Disciplinary Knowledge</td><td>Earth and space (Year 5) +forces
Day and night
Ext make shadow clocks / sundial- Ext moons on other planets- Ext research Ptolemy

• 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</td></tr>
<tr><td>VOCAB</td><td>Earth, sun, moon, solar system, axis of rotation, day, night, phases of the moon, star, constellation, gravity, friction, water resistance, air resistance</td></tr>
<tr><td>Learning Objective</td><td colspan="3">1. To describe the movement of the Earth, and other planets, relative to the Sun in the solar system creating simple models of the solar system
2. To describe the movement of the Moon relative to the Earth
3. To describe the Sun, Earth and Moon as approximately spherical bodies
4. 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) 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.
5. 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)
6. To identify the effects of air resistance, water resistance and friction, that act between moving surfaces</td></tr>
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