# Lacewood Primary School
# Knowledge and Skills Progression Plan for Science

**Golden Threads**

The core knowledge for science has been chosen to aid pupil's understanding in physics, chemistry, biology and earth science. Threads of scientific enquiry skills and knowledge have also been selected to ensure knowledge and skills are interrelated. These threads include: Physics, Chemistry, Biology and Working Scientifically. By carefully mapping out the sequence of knowledge and concepts, as well as the threads of working scientifically, pupils at Lacewood have the opportunity to learn subject content in depth and develop their scientific enquiry skills.

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| Working Scientifically – **Threaded throughout** |
| Biology |
| Physics |
| Chemistry |

## EYFS

### EYFS Science Knowledge and Understanding and Composite Questions for Exploration

**Knowledge and Understanding Core Strands from the Curriculum**

| FS1 | FS2 |
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| To learn about the ways in which we take care of ourselves e.g. hand washing, toileting, dressing ourselves, diet, etc. (PSED MS) | To learn the importance of healthy practises including managing our physical, hygiene, dietary and mental needs. (PSED MS) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • How can I manage my own toileting needs with increasing independence?<br>• What are the key skills for managing dressing and undressing independently? How do I put on and fasten my coat? What do I do if my clothing is inside out? Etc.<br>• When must I wash my hands?<br>• Why should I drink water instead of pop/eat fruit instead of sweets? Etc. Why do we only eat and drink healthy foods when we are at school?<br>• Why am I tired/hot/cold/thirsty/poorly? Etc. | • What steps do I take everyday to stay fit and healthy?<br>• Why is it important to stay clean and to follow hygiene procedures?<br>• How do exercise, sleep, a good diet and relaxation help me to stay fit and well?<br>• What does a healthy diet look like? What simple changes can I make to improve my diet?<br>• What makes me feel happy, safe, healthy, good inside, loved, settled and strong? How can I keep these feelings growing?<br>• What makes me feel, weak, sad, unwell, lonely, anxious, worried, scared etc? What can I do and how do I take steps to overcome these difficult feelings? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To understand how a human grows and changes over time. (UTW PP) | To talk about past and present events in their own lives and those of people familiar to them, with an awareness of how they, and the things around them, have grown and changed (UTW PP) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • How have we physically grown and changed so far? (Hist link)<br>• How will I grow and change as I get older? (Hist link)<br>• What can I do now, that I couldn't when I was a baby?<br>• What will happen to me as I get older – age of 5, 10, 15, 20, 50, 70 etc.?<br>• Why are the people in my family all different sizes and can do different things? | • How have I grown and changed compared to my peers? (Hist link)<br>• What are the important life events of people familiar to me? (Hist link)<br>• What am I good at, what have I got better at and what do I want to be better at in the future? (Hist link)<br>• What changes will I see in my body when I am 10, 15, 20, 40, 60, 100?<br>• What skills will I be able to develop as I grow older? What does my body need to be able to do to reach that goal?<br>• How am I similar and different to the people in my class, in my school, in my family?<br>• How have people who are familiar to me grown and changed? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To sort materials (natural and man-made) and talk about how they are similar and how they are different, using an increasingly wide range of vocabulary.(UTW NW) | To use their senses to explore and describe the natural world around them using new vocabulary. .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • What is this made from? What other things can I find that are made from the same material?<br>• Why do these materials belong together? How are they the same? | • How would I describe what I notice about how this feels/smells/tastes/looks/sounds?<br>• What can I find that is – strong, transparent, bumpy, ridged, rigid, flexible, stiff, huge, tiny, etc?<br>• How can I sort these materials? Can I find a different way to sort them? (Maths link) |

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| • Can I find things that are hard/soft, rough/smooth, big/small, heavy/light etc? (link to concept cat, smooth/not smooth, rough/not rough etc.)<br>• What words describe how this feels/smells/tastes/looks/sounds?<br>• What is the same/different about these things? | • Which is the odd one out/why?<br>• Which material is the most suitable for my project, why? What do I need to help me complete this project/solve this problem?<br>• Is this material natural or man-made? How can I tell? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To find out how some materials can be changed and develop vocabulary to describe the changes. (UTW NW) | To observe and describe similarities, differences, patterns and change in nature. .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • What does this feel/look like? When we mix this in/mix these together? What do you notice? What has changed?<br>• Why did that happen? When you did that, what did you notice happen?<br>• Can we change it back to how it was?<br>• What words describe how this feels/smells/tastes/looks/sounds?<br>• What can you do to this? | • Can I find something that is the same? How are these the same? What is the same?<br>• Can I find something that is different? How are these different? What is different?<br>• What do I notice? What has changed? How has it changed? Why has it changed? Can it/will it change back?<br>• How does this remind me of ….? How is it the same? How is it different? E.g. butterfly - remind me of symmetry, ladybird life cycle – butterfly life cycle, colours-Autumn etc. Have I seen this before? When/How?<br>• What is this pattern? What do Notice about this pattern? What does this pattern remind me of? (Maths link) |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To talk about, ask questions and comment about the features of the plants, animals and natural materials they observe using an increasingly wide range of vocabulary. .(UTW NW) | To observe and describe similarities and differences in relation to objects, places, materials and living things. .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • What does this…. look like? How would I describe it? What do I notice? Is it like anything else that I have seen or know about – how?<br>• Where would I find/see it? When might I see it?<br>• Is it something I would see in my everyday life/locally?<br>• Animals – how does it move? What does it eat? What sounds does it make? Where does it live? What other animals are similar to it/how? (also different)<br>• Plants – where does it grow? How does it grow? How do we look after it – what does it need?<br>• Materials – what does this feel/look/smell/sound/taste (f appropriate) like? Where did it come from? How did it get there? What could it be used for? | • Does this grow and change – how/why?<br>• What other animals look similar? What other animals live in the same habitat? How does it stay alive – what does it need?<br>• How are these plants/animals/materials the same/different?<br>• Which other animals/plats/materials - move/grow/eat/habituate in the same way?<br>• Why do these belong together?<br>• What different ways can we group/sort these?<br>• What do I notice and how would I describe these? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To understand the key features of the life cycle of plants and some animals. .(UTW NW) | To make observations of plants and animals, consider why some things occur and describe the changes they notice. (life cycles, endangered etc.) .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • How does a caterpillar grow and change?<br>• How do humans grow and change overtime (History link)<br>• What happens to these plants/animals over time? How do they change? What is different? | • What do I notice about this plant/animal?<br>• How would I describe the life cycle of a chicken, butterfly, frog, ladybird, plant etc?<br>• Why has this happened? Why has this changed? What made this change?<br>• How will this grow and change? What might alter/affect how it grows or changes?<br>• What does the word extinct mean? Why are some plants/animals in danger? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To understand the need to respect and care for the natural environment and all living things. .(UTW NW) | To understand the effect the changing seasons has on the environment around them. .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • What steps can I take to look after the areas around my school/home/street?<br>• Why must I check with an adult before picking plants?<br>• Why do I need to make sure I put minibeasts back where I find them?<br>• How do we take care of living things? | • How has the environment immediately around me changed in the past 2 weeks/month/since ..?<br>• What differences can I see in the plant life when I look out of the window or walk around the playground?<br>• What wildlife is around me just now? What is it doing/how is it behaving? Why?<br>• Why has my clothing changed recently? What do I need to wear outside today – why? |
| **Knowledge and Understanding Core Strands from the Curriculum** | |
| To begin to understand the effect their behaviour can have on the environment. .(UTW NW) | To find out about some of the impact humans can have on the environment. .(UTW NW) |
| Composite Questions/Lines of Enquiry | Composite Questions/Lines of Enquiry |
| • Why is it important to put litter into the bins? What happens to litter when it is on the floor?<br>• Why do we have recycling bins? What can we do to help the wildlife around us survive and live in safety? | • What do I notice in the area immediately around me? What do I like? What would I change/improve? How and why? (Geog link)<br>• What does re-use/recycle/reduce mean? Why is it important? What effect can plastics have on the wildlife around school and in the wider world?<br>•<br>• Why are some animals at risk of extinction? How have humans impacted this? |

| End Point FS1 | End Point FS2 |
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| I can talk about and describe the features of different materials that I handle – what they feel, look, taste, smell, sound like. (as appropriate)<br>I can sort object according to characteristics e.g. same – not the same (hard/not hard)<br>I can describe how some materials change as I explore them. (e.g. baking)<br>I know that some changes cannot be reversed.<br>I know that I am different now to when I was a baby.<br>I know what a baby/toddler/child/adult is.<br>I can describe the changes I see happening around me – e.g. seasonal, plant growth, caterpillars etc.<br>I know that some animals have a different life cycle to humans.<br>I can describe the key stages of the life cycle of a butterfly.<br>I know that it is important to look after the environment around me.<br>I know how to take care of the area immediately around me.<br>I can name at least 5 minibeasts.<br>I know that some materials can be recycled. | I can name the 5 senses – smell, taste, sight, touch, hearing.<br>I can sort and classify materials according to similarities and differences.<br>I can name and identify a range of different materials.<br>I can test out materials to find out about their properties.<br>I can select an appropriate material from a selection to achieve a purpose.<br>I can describe the changes I see happening around me during Autumn time.<br>I know what simple steps I take to look after my own health and hygiene.<br>I know that having a healthy diet and doing exercise is important.<br>I can name and identify a wider range of feelings – excited, anxious, frightened, calm, worried etc.<br>I recognise what has made me feel a particular feeling.<br>I can describe how I have grown and changed.<br>I can describe how a human grows and changes throughout their life.<br>I can describe the life cycle of animals such as chickens, butterflies and frogs.<br>I can describe how a simple plant grows and changes as I observe it.<br>I know what I want to be good at and some of the steps I need to take to achieve my goal.<br>I can describe my observations of plants and animals.<br>I know what the term “Extinct” means and why some animals are endangered.<br>I can sort or group living things and objects according to their similarities and differences.<br>I can describe why a living thing or object belongs in a particular group.<br>I can describe my local environment, what I like and what I would like to change and why.<br>I know that humans can have a negative or positive impact on our whole environment.<br>I know some of the steps we need to take to help to protect our planet.<br>I know what the terms “recycle”, “Reduce”, “re-use” mean.<br>I can describe the changes I observe in the environment around me.<br>I can describe the weather/climate around me and what I need to do to prepare for it. |
| **End of EYFS - ELG** | |
| • Explore the natural world around them, making observations and drawing pictures of animals and plants. (UTW NW)<br>• Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. (UTW NW)<br>• Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (UTW NW)<br>• Manage their own basic hygiene and personal need, including dressing, going to the toilet and understanding the importance of healthy food choices. (PSED MS) | |

## Using Our Lacewood Learning Buddies in Science

- Investigating lines of enquiry – continuous questioning- planning the experiment.
- Having the opportunities to test theories and to take risks.
- Testing the properties of various materials/energies/forces.
- Develop an understanding through questioning- What happened during the experiment/test/investigation? What was the cause and effect?

- The learning skills required to become independent (e.g. what equipment is needed to carry out the investigation/test/experiment).
- Selecting the appropriate equipment to carry out fair tests.
- Understand how to use equipment safely and appropriately to conduct successful investigations.
- Justify your conclusions/results and outcomes of the above investigations.

- Presenting your results to others.
- Collaborating with others to explore and complete investigations.
- Exploring the properties of materials/energies/forces.
- Share resources during investigations.
- Exploring patterns and relationship of the results of investigations.

- Working scientifically – thinking about investigations and the questions needed (Testing those questions)
- Make connections between theories and results.
- Develop your own lines of enquiry/hypothesis.
- Evaluating investigations and experiments.

| Science | Key Stage 1 | | Key Stage 2 | | | |
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| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| NC | The national curriculum for science aims to ensure that all pupils:  develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics  develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them  are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future | | | | | |
| **Working Scientifically**<br><br>**WS1: Working Scientifically Skills** | **Working Scientifically**<br>• To ask questions and know they can be answered in different ways<br>• To look closely, using equipment<br>• To do tests<br>• To name and group | **Working Scientifically**<br>• To ask questions and know they can be answered in different ways.<br>• To watch closely using equipment. • To do tests.<br>• To name and group. | **Working Scientifically**<br>• To ask questions and use different types of scientific enquiries to answer them.<br>• To set up simple practical enquiries, comparative and fair tests. | **Working Scientifically**<br>• To ask questions and use different types of scientific enquiries to answer them.<br>• To set up simple practical enquiries, comparative and fair tests. | **Working Scientifically**<br>• To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.<br>• To take measurements, using a range of scientific | **Working Scientifically**<br>• To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.<br>• To take accurate measurements, using a range of scientific |

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| **Purple: Teachers' notes.** | • To use my observations and ideas to suggest answers to questions<br>• To collect and record data to help answer questions | • To use my observations and ideas to suggest answers to questions<br>• To collect and record data to help answer questions. | • To make observations and take measurements using standard units, using a range of equipment, including thermometers and data loggers.<br>• To gather, record, classify and present data in a variety of ways to help with answering questions.<br>• To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.<br>• To report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions. can use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.<br>•To explain differences, similarities or changes related to simple scientific ideas and processes.<br>• To use straightforward scientific evidence to answer questions or to support my findings | • To make observations and take measurements using standard units, using a range of equipment, including thermometers and data loggers.<br>• To gather, record, classify and present data in a variety of ways to help with answering questions.<br>• To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.<br>• To report on findings from enquiries, including spoken and written explanations, displays or presentations of results and conclusions can use results to draw simple conclusions, make predictions for new values, suggest improvements, and raise further questions.<br>•To explain differences, similarities or changes related to simple scientific ideas and processes.<br>• To use straightforward scientific evidence to answer questions or to support my findings. | equipment, with increasing accuracy and precision, taking repeat readings when appropriate.<br>• To record data and results of increasing complexity, using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.<br>• To use test results to make predictions to set up further comparative and fair tests.<br>• To talk about and present findings from enquiries, including conclusions, causal relationships and explanations of how reliable the information is. •To identify scientific evidence that has been used to support or refute ideas or arguments. | equipment, taking repeat readings when appropriate.<br>• To record complex data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.<br>• To use test results to make predictions to set up further comparative and fair tests.<br>• To report and present 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.<br>• To identify scientific evidence that has been used to support or refute ideas or argument. |
| | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Biology - Plants** | | | | | | |

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| **Key Questions** | What do plants need to grow?<br><br>What are the names of the parts of a plant/ tree?<br><br>What are the signs that a plant is growing? What stages can we see?<br><br>What are the names of some garden plants? What do they look like? Where do they grow?<br><br>What are the names of some wild plants? What do they look like? Where do they grow? | What should I do to grow a healthy plant?<br><br>What types of plants can I find in the school grounds?<br><br>What do sunflower/bean seeds need to grow?<br><br>What's Inside a Seed?<br><br>What is inside a bulb?<br><br>How are bulbs and seeds different?<br><br>How do seeds and bulbs grow into a plant?<br><br>What is the life cycle of a plant like?<br><br>What Do Plants Need to Stay Healthy? | How do plants reproduce?<br>Do all flowers look the same?<br>How do insects know which flowers to pollinate?<br><br>Why do flowers smell?<br><br>What do plants need to grow well?<br><br>What conditions are perfect for a seed to grow?<br><br>What are the names of the parts of a plant and what are their functions?<br><br>How do plants make their food?<br><br>How is water transported to the parts of the plant?<br><br>Can you explain the life cycle of a plant? | | | |
| **Biology (plants)** | *(Plant a bean plant in week 1)*<br>**(Linked to WS standards over the half term)**<br><br>I can identify and describe the basic structure of a variety of flowering plants.<br><br>I can identify and name a variety of common wild plants. | I can observe plants in the local area and record what is seen.<br><br>I can observe and describe how seeds and bulbs grow into mature plants. *(plant sunflower seeds/ paperwhite narcissus bulbs/fast germinating test seeds)* | I can identify and describe the functions of different parts of flowering plants (*including –Roots, Stem/trunk, Flowers, Leaves)*<br>**WS1: To investigate what small plants need to grow well.** | | | |

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| | **(WS1 skill: to gather and record data)**<br><br>I can identify and name a variety of common garden plants **(WS1 skill: to gather and record data)**<br><br>I can identify and name a variety of wild and garden plants, including deciduous and evergreen trees *(Deciduous trees Evergreen trees)*<br><br>I can identify and describe the basic structure of a variety of plants, including trees.<br>**WS1: How do plants grow?**<br><br>I can observe closely, using simple equipment in the context of observing the growth of bean plants.<br><br>I can use observations to suggest answers to questions about what plants need to grow. | **WS1: A comparative test to understand what plants need to germinate and grow**<br><br>I can perform a simple test and make a prediction<br><br>I can observe and describe how seed and bulbs grow into mature plants explaining the life cycle of plants.<br><br>I can investigate and describe how plants need water, light and a suitable temperature to grow and stay healthy.<br>**WS1: What do plants need to germinate and grow?**<br>I can record data<br>I can compare the growth of seeds and bulbs. | *(Small plants such as tomato, bean and sunflower seedlings)*<br>*air, light, water, nutrients from soil, and room to grow*<br><br>I can record findings, label diagrams, keys and tables and report on the findings using written explanations, results and conclusions.<br><br>I can investigate how water is transported within plants (*food colouring through a flower stem)*<br><br>I can explore the part that flowers play in the life cycle of flowering plants by exploring pollination and fertilisation (*including – Pollination, Seed formation, Seed dispersal*<br><br>I can order and describe the stages of the life cycle of a flowering plant | | | |
| **Substantive Knowledge** | Know the names of some plants, trees and flowers.<br><br>Know that plants grow from seeds and bulbs.<br><br>Know that plants need light and water to grow and survive. | Know that lots of plants can be found in our school environment and observe and record some examples e.g. different trees grass flowering, plants shrubs.<br>Know that seeds and bulbs need water and warmth to germinate. | Know plants are producers, they make their own food.<br><br>Know the functions of different parts of the plant.<br><br>Know flowering plants have specific adaptations | | | |

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| | Know that plants are important.<br><br>Know the difference between wild and garden plants.<br><br>Know that we can eat lots of plants.<br><br>Know what an 'evergreen tree' is and why it has its name.<br><br>Know what a root is and its function in a plant. | Know that plants need light carbon dioxide and water to grow<br><br>Know that inside a seed is a food source and a baby plant with roots and shoot.<br><br>Know what a bulb is and how it is different to a seed.<br><br>Know the stages of a simple lifecycle of a plant from seed to seed creation.<br><br>Know that plants need water light suitable temperature sunlight and nutrients to flourish.<br><br>Know what happens to the plant when these needs are removed | which help it carry out pollination, fertilisation and seed production.<br><br>Know plants have roots, which provide support and draw water from the soil.<br><br>Know how the plant life cycle works.<br><br>Know the order of the stages of a life cycle of a plant.<br><br>Know seed dispersal improves a plant's chances of successful reproduction.<br><br>Know what plants need to grow well. | | | |
| **Vocabulary** | Deciduous, evergreen, stem, root, trunk, seed, bulb, flower, petal, light. | Leaves<br>Trunk<br>Stem<br>roots<br>flower<br>grow<br>germinate<br>warmth,<br>temperature,<br>sunlight,<br>observe,<br>compare,<br>record,<br>bulb<br>seed,<br>shrubs | Air<br>Light<br>water<br>absorb<br>fair test<br>pollination<br>dispersal<br>prediction<br>stem<br>leaf<br>petal<br>roots<br>nutrients<br>support<br>anchor<br>transportation | | | |

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| **Biology – Animals (including humans)** | | | | | | |
| **Key Questions** | What is an amphibian?<br><br>What is a reptile?<br><br>What is a mammal?<br><br>What does warm-blooded and cold-blooded mean?<br><br>What is an omnivore, herbivore, carnivore?<br><br>Where do mammals/ amphibians/ birds and reptiles live? Why do they live in different places?<br><br>Do all animals hunt?<br><br>Why do animals look differently?<br><br>How can we group animals?<br>What are the names of the main parts of our bodies?<br><br>What is the function of the different parts of the human body?<br><br>How do our bodies change as we grow?<br>How do we take care of our pets? What do pets need to survive?<br><br>Is it appropriate to keep all types of animal as a pet?<br>Are there any animals that | Do All Animal Offspring Look like Their Adult When They Are Born?<br><br>How do animals change as the grow?<br><br>How do humans change as they grow?<br><br>What do animals and humans need to survive?<br><br>What types of foods do humans need to be healthy?<br><br>Why is exercise important?<br><br>Why is good hygiene important? | What is nutrition?<br><br>Why is nutrition important to animals and humans?<br><br>What is the job of the skeleton in humans and animals?<br><br>What are the major bones within the human body?<br><br>What is the job of the muscles for humans and some other animals?<br><br>What are the 4 types of human teeth?<br><br>What are the different jobs of the teeth? | Do all organisms eat the same food?<br><br>What is our digestive system?<br><br>Why do we need a variety of foods?<br><br>What happens to our food?<br><br>Why do some people need different diets? (Weightlifter vs Marathon runner)<br><br>How does our food turn into urine and excrement? | How can we keep our heart and body healthy?<br><br>How does our heart work?<br><br>Why do we have blood?<br><br>How do humans change throughout their lives?<br><br>What causes puberty?<br><br>Are there any patterns between vertebrate animals and their gestational periods? | |

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| | would not make a good pet? Why?<br><br>What parts of our bodies are responsible for each of our 5 senses?<br><br>What are our 5 senses? | | | | | |
| **Animals including humans** | I can identify and name a variety of common animals *including (Fish, Amphibians, Reptiles, Birds and Mammals)*<br><br>I can identify and name a variety of animals, *including: (Carnivores, Herbivores Omnivores*<br><br>I can describe and compare the structure of a variety of common animals:*(Fish, Amphibians, Reptiles, Birds, Mammals (including pets)*<br><br>**<u>Animals Including Humans; Human Element</u>**<br>I can Identify, name, draw and label the basic parts of the human body<br><br>I can identify which part of the body is associated with each sense<br>**WS1: Senses Investigation**<br><br>I can perform simple tests in the context of investigating each of the five senses. | I can notice that animals have offspring which grow into adults and to describe the changes as they grow.<br><br>I can notice that humans have offspring which grow into adults and to describe the changes as they grow.<br><br>**WS1: Do children get faster as they get older?**<br>LO: To perform a simple test and record data in an investigation.<br><br>I can investigate and describe the basic needs of animals, including humans, for survival: *Water Food Air*<br><br>I can describe the importance for humans of eating the right amounts of different types of food.<br><br>I can describe the importance for humans to exercise<br>I can describe the importance for humans to practise good hygiene. | I can identify that animals including humans need the right type and amount of nutrition.<br><br>I can identify that animals including humans have skeletons<br><br>I can identify and name bones<br><br>I can identify that humans and some animals have skeletons for support, protection and movement.<br><br>I can identify that humans and some other animals have muscles for movement. | I can identify and name the basic parts of the digestive system in humans<br><br>I can explain the functions of the different parts of the digestive system<br><br>I can identify that animals including humans need the right type and amount of nutrition.<br><br>I can distinguish between scientific and non-scientific questions.<br>I can set up simple practical enquiries, comparative and fair tests.<br><br>I can draw up simple observations and conclusions | I can describe the changes as humans develop to old age.<br><br>I can explore how babies grow and develop.<br><br>I can explain how the circulatory system works.<br><br>I can describe how nutrients are transported around the body.<br><br>I can explain how to keep the heart and body healthy.<br><br>I can describe and explain the main changes during puberty.<br><br>I can identify the changes that take place in old age.<br><br>I can compare gestation periods and life expectancies of animals. | |

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| | I can gather and record data to help in answering questions. | | | | | |
| **Substantive Knowledge** | Know that amphibians are cold-blooded vertebrate, such as frogs, toads, newts and salamanders.<br><br>Know that amphibians use gills to breathe when younger and then lungs when they have matured.<br><br>Know that mammals provide milk for their young.<br><br>Know that we are mammals.<br><br>Know that animals need food to survive.<br><br>Know that animals have senses and can respond.<br><br>Know that animals need a variety of food to be healthy and to grow.<br><br>Know that carnivores eat meat, herbivores eat plants and omnivores eat both.<br><br>Know that birds are warm blooded egg-laying vertebrates.<br><br>Know that birds have feathers, wings, a beak and can fly. | Know that different animals have different types of offspring and that some are live births and some are born from eggs.<br>Know that some animals look like the adult and some do not and change e.g. butterfly<br><br>Know the stages that a butterfly goes through as it moves through its life cycle<br><br>Know the stages of Human lifecycle: baby, toddler, child, teenager, adult.<br><br>Know that animals and humans need air water and food to survive<br><br>Know that humans need a balanced diet to be healthy including different food groups.<br><br>Know that humans need exercise to have healthy bones heart muscles.<br>Know that hygiene is important to prevent diseases. | Know what nutrition is and why it is important for humans and animals.<br><br>Know the skeleton is for support, protection and movement.<br><br>Know the names of the basic bones in the human skeleton -<br><br>Know that muscles help us to move.<br><br>Know the names of the 4 types of human teeth.<br><br>Know that food is broken down by the teeth.<br><br>Know different teeth do different jobs. | Know different organisms have different diets.<br><br>Know the digestive system is made up of the mouth, the tongue, the oesophagus, stomach, large intestine and small intestine.<br><br>Know the mouth is where food is chewed by the teeth.<br><br>Know the tongue rolls the food into a ball to be swallowed.<br><br>Know food is swallowed in the oesophagus and passes to the stomach.<br>I know food is digested in the stomach.<br><br>Know the small intestine is where food continues to be digested and also absorbed into the bloodstream.<br><br>Know that the large intestine is where water moves back into the blood and faeces are formed.<br><br>Know what nutrition is needed for animals and humans to be healthy. | Know that the heart is the main organ in the circulatory system.<br><br>Know how the heart, blood vessels and blood works. (atriums and ventricles)<br><br>Know that nutrients are transported around the body.<br><br>Know that to keep the heart and body healthy you need to have a balanced diet and exercise.<br><br>Know that drugs, alcohol and smoking has a negative impact on the heart and body.<br><br>Know about how our bodies will change and develop from birth to old age. For example: height, physical abilities<br><br>Know that puberty is something that happens to us all. For example: Sexual organs develop<br><br>Know that life expectancy is different across species. | |

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| | Know that amphibians need to live in a wet or moist habitat.<br><br>Know that birds can live in different habitats (deserts, mountains, wetlands etc).<br><br>Know that fish need to live in water to survive.<br><br>Know that mammals live on land.<br><br>Know the names of the main outer parts of the human body (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth).<br><br>Know about animals that are kept as pets (dogs, cats, hamsters, mice, rabbits etc).<br><br>Know that pets need feeding, cleaning, shelter, walking.<br><br>Know that we smell with our noses, see with our eyes, touch and feel with our skin and hands, hear with our ears and taste with our tongues.<br><br>Know how to explore different materials appropriately (e.g. we smell lemons with our noses, listen to music with our | | | | Know that gestation periods vary across species. | |

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| | ears, taste sugar with our tongue). | | | | | |
| **Vocabulary** | Amphibian, mammal, reptile, cold blooded, warm blooded, carnivore, herbivore, omnivore, senses, taste, hearing, smell, sight, touch, elbow, shoulder, knee. | Adult,<br>develop,<br>young,<br>offspring,<br>live young,<br>hatchling,<br>hatch,<br>larvae,<br>eggs,<br>protein<br>carbohydrates<br>dairy<br>fats<br>vegetables<br>fruit<br>sugars<br>vitamins<br>balanced diet<br>hygiene<br>disease<br>germs<br>exercise | Skeleton<br>muscles<br>nutrition<br>tooth decay<br>enamel | nutrition<br>digestive system<br>tongue<br>mouth<br>oesophagus<br>muscles<br>intestine<br>gall bladder<br>pancreas | oxygenated<br>deoxygenated<br>circulatory System<br>artery<br>veins<br><br>gestation<br>puberty<br>life Expectancy<br>hormone<br>foetus | |
| **Biology – Living things and their habitat** | | | | | | |
| **Key Questions** | | How do we know when something is alive, dead or never been alive?<br><br>What is a habitat?<br><br>What are the different types of Habitats?<br><br>What type of plants and animals live in the different habitats? | | What is food chain?<br>What are the different relationships within food chains?<br>What food chains and webs are in our local habitat?<br>How does energy move through the food chain?<br>How does removal of one species from an environment affect others? | | What is a life cycle?<br>What types of life cycles are there?<br>Do plants reproduce the same way as us?<br>How do plants spread their seeds?<br>How do animals change over time?<br>Why does variation exist?<br>What happens if animals of different species breed?<br>What happens to house plants outside? |

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| | | Why do these plants and animals live in these habitats?<br><br>How have plants and animals adapted to live in their habitat?<br><br>What type of habitats can we find in our local area?<br><br>What is a food chain?<br><br>What are consumers and producers?<br><br>How are animals ordered in food chains? | | How does human activity affect our environment?<br>How can we group living things?<br>What is a classification key?<br>How do they help us group, identify and name living things?<br>What are vertebrates and invertebrates? | | What are microorganisms?<br>How can we prevent the spread of disease?<br>Why do animals and plants compete?<br><br>**Spring B**<br>How do mammals produce offspring?<br>What happens during the gestation period of a mammal?<br>How are placentals born?<br>What is a monotreme and how are they born?<br>How are marsupials born?<br>What is metamorphosis?<br>What are the stages of an insect's life cycle?<br>What are the stages of a mammal's life cycle?<br>What are the stages of a bird's life cycle?<br>What are the stages of an amphibian's life cycle? |
| **Living things and their habitat** | | I can explore and compare the differences between things that are living, dead, and things that have never been alive.<br><br>I can identify and name a variety of plants and animals in their habitats *(could visit a local habitat, woodland etc.)*<br><br>I can identify and name a variety of plants and animals in their habitats, including microhabitats. | | I can construct and interpret a variety of food chains identifying Producers,<br>Predators and Prey.<br><br>I can recognise that living things can be grouped in a variety of ways.<br><br>I can classify vertebrates and use classification keys to help group, identify and name a variety of living things.<br>*-In the local environment*<br>*-In the wider environment* | COMPLETED IN Y6 | I can classify animals based on their similarities and differences.<br><br>I can describe how living things are classified into broad groups according to common characteristics *(to include micro-organisms, plants and animals by finding out about the Linnaean System of classification)*<br><br>I can identify the characteristics of different types of animals. |

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| | | I can identify that most living things live in habitats to which they are suited.<br><br>I can describe how different habitats provide for the basic needs of different kinds of animals and plants.<br><br>I can identify that most living things live in habitats to which they are suited and describe how they depend on each other<br><br>I can describe how animals obtain their food from plants and other animals (*The ideas of a simple food chain -Identify and name different sources of food)* | | I can identify vertebrates by their similarities and differences.<br><br>I can identify invertebrates.<br><br>I can classify invertebrates and use classification keys to help group, identify and name a variety of living things.<br>*-In the local environment*<br>*-In the wider environment*<br><br>I can recognise that environments can change and that this can sometimes pose dangers to living things *(in a local habitat)* | | *(mammals, birds, insects, reptiles, amphibians, fish, arachnids, annelids, crustaceans, echinoderms and molluscs)*<br><br>I can describe and investigate helpful and harmful microorganisms<br>**WS1: Mould investigation**<br>I can identify the characteristics of different types of microorganisms.<br><br>I can classify organisms found in the local habitat.<br><br>I can describe the life process of reproduction in some plants and animals.<br><br>I can describe sexual reproduction in mammals.<br><br>I can describe the life cycle of a mammal.<br><br>I can compare the differences in the life cycles of an amphibian and an insect.<br><br>I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. |
| **Substantive Knowledge** | | Know some of the life processes.<br><br>Know how life processes can tell us if something is | | Know a food chain consists of producers and consumers. | | Know that scientists sort and group living things according to their similarities and differences (classification). |

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| | | living, dead or has never been alive.<br><br>Know if something is living, dead or has never been alive.<br><br>Know identify and name a variety of plants and animals in tour local habitats, by mapping a habitat and identifying its inhabitants.<br><br>Know and name different habitats<br><br>Know that different habitats have different conditions<br><br>Know that plants and animals have adaptations to allow them to survive in different habitats.<br>Know some features of animals that allow them to live in particular habitats.<br><br>Know what a carnivore, herbivore, omnivores are Know what a food source is know and name producers and consumers<br><br>Know what a food chain is and order animals and plants into simple food chains. | | Know predators hunt prey.<br><br>Know that there is a specific order of consumers: Primary, Secondary, Tertiary, Quadatory.<br><br>Know decomposers are bacteria that breaks down dead plants and animals into liquid for food.<br><br>Know detritivores are animals that eat decomposing plants and animals.<br><br>Know vertebrates have a spine / backbone and invertebrates do not.<br><br>Know how a classification tree can help sort different species.<br><br>Know how to interpret and create a classification tree.<br><br>Know that if one species is removed from a food chain it can have a negative impact on how the food chain works and the habitat it is found. | | Know that scientists who classify information are called taxonomists.<br><br>Know how to sort animals based on their similarities and differences (2 legs/4 legs, fly/not fly etc).<br><br>Know that Carl Linnaeus was a Swedish scientist who published 10 editions of his book 'Systema Naturae' which described his system for classifying living things.<br><br>Know all the levels of the Linnean System (Domain, Kingdom, Phylum, Class, Order, Family, Genus and Species).<br><br>Know that all animals and plants are all eukaryotes.<br><br>Know that some microorganisms are helpful (bacteria – milk, yoghurt; yeast – wine, bread; fungi – antibiotics).<br><br>Know that some microorganisms are harmful (bacteria – food poisoning, plaque; virus – chicken pox, influenza; fungi – mould, athletes' foot).<br><br>Know that some animals and plants are |

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| | | | | | | microorganisms (dust mites, plankton).<br><br>Know that mould, penicillium and yeast are a type of microorganism (fungi).<br><br>Know that bacteria is a type of microorganism (staphylococcus epidermis).<br><br>Know that mammals use sexual reproduction to produce offspring.<br><br>Know the male sperm will travels down the male's penis and enters the female's body through the vagina.<br><br>Know that a sperm cell will fuse with the ovum, the female gamete, which causes fertilisation.<br><br>Know the cell splits split in half and continue to divide each time until a baby is formed and the heart starts to beat.<br><br>Know placentals grow their offspring inside the female body and are born fully developed. (bats, dogs, humans).<br><br>Know monotremes hatch from eggs (platypus). |

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| | | | | | | Know marsupials' young are born incompletely developed. They are then carried and fed in a pouch on the female's stomach until they are fully developed.<br><br>Know that metamorphosis is a process by which animals undergo change in the structure of their body (newt, butterflies, dragonflies).<br><br>Know the stages of an insect's life cycle – complete metamorphosis (egg, larva, pupa, adults).<br><br>Know the stages of an insects life cycle – incomplete metamorphosis (egg, nymph, adult).<br><br>Know the stages of a mammal's life cycle (embryo, young, adult).<br><br>Know the stages of a bird's life cycle (egg, young, adult).<br><br>Know the stages of an amphibian's life cycle (egg mass, tadpole, tadpole with legs, young frog, adult). |
| **Vocabulary** | | Life process,<br>living,<br>non-living,<br>dead, | | classification<br>pollution<br>human impact<br>vertebrates | | Variables, Kingdom, Linnaean, Organism, Microbes |

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| | | never alive,<br>movement,<br>respiration,<br>sensitivity,<br>growth,<br>reproduction,<br>excretion,<br>nutrition<br>Habitat<br>Microhabitat<br>Food chain,<br>consumer,<br>producer,<br>predator,<br>prey,<br>herbivore,<br>carnivore, omnivore | | invertebrates<br>environment<br>carnivores<br>omnivores<br>herbivores<br>amphibians<br>reptiles | | |
| **Biology – Evolution and Inheritance** | | | | | | |
| **Key Questions** | | | | | | How do fossils provide information about living things from millions of years ago?<br>Why do living things produce offspring of the same kind?<br>Why do offspring vary and are not identical to parents?<br>How are plants and animals adapted to suit their environment?<br>Why may adaptation lead to evolution?<br>What theory did Charles Darwin develop about evolution? |
| **Evolution and inheritance** | | | | | | I can explain the concept of inheritance *(living things produce offspring of the* |

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| | | | | | | *same kind, but normally offspring vary and are not identical to their parents)*<br><br>I can identify how animals and plants are adapted to suit their environment in different ways.<br>**WS1: Beak investigation – linked to Darwin's theory of evolution.**<br><br>I can identify the key ideas of the theory of evolution *(adaptation may lead to evolution)*<br><br>I can identify evidence of evolution from fossil records *(living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago).*<br><br>I can explore how human beings have evolved.<br><br>I can identify how adaptation can result in both advantages and disadvantages.<br><br>I can explain how human intervention affects evolution. |
| **Knowledge** | | | | | | Know that fossils provide archaeologists with information about living things from the past. |

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| | | | | | | Know why offspring inherit characteristics (such as eye, hair and skin colour) from their biological parents.<br><br>Know that some characteristics are not inherited from their parents.<br><br>Know that plants and animals are adapted to suit their environment.<br><br>Know that plants and animals that are best suited to their environment are more likely to survive long enough to reproduce.<br><br>Know that Charles Darwin went on a 5-year voyage and visited many places across the world.<br><br>Know that Charles Darwin discovered finches in the Galapagos Islands and that they had different beaks dependant on their environment.<br><br>Know that Charles Darwin wrote a book called 'On the Origin of Species'.<br>Know that Charles Darwin's book was not widely accepted at first. |
| **Vocabulary** | | | | | | Inheritance, species, genes, evolution, adaptation, variation, inherited, survival of the fittest, evidence. |

| Physics - Light | | | | | | |
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| **Key Questions** | | | What is light?<br><br>What kind of surfaces reflect light?<br><br>Why can the light from the sun be dangerous for us?<br><br>How are shadows formed?<br><br>What happens to a shadow when you change the distance between the object and the light source? | | | How do we see?<br>What is a light source?<br>What does transparent mean?<br>What does opaque mean?<br>What does translucent mean?<br>How does the size of an object affect the size of a shadow?<br>How does the distance between the light and the object affect the size of the shadow?<br>Does all shadow have the same shape of the object that cast them?<br>How does a periscope work? (WW2) |
| **Physics (Light)** | | | I can recognise that I need light in order to see things. *(dark is the absence of light).*<br><br>I notice that light is reflected from surfaces.<br>**WS1: Which surfaces reflect light?**<br><br>I recognise that light is reflected from surfaces.<br><br>I recognise that light from the sun can be dangerous and that there are ways to protect the eyes.<br><br>I recognise that shadows are formed when the | | | I recognise that light appears to travel in straight lines<br><br>I can explain that how we see things.<br><br>I can investigate the angles of incidence and reflection.<br><br>I can create a periscope and explain how it works.<br><br>I can investigate how refraction changes the direction in which light travels.<br><br>I can investigate how a prism changes a ray of light. |

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| | | | light from a light source is blocked by a solid object.<br>**WS1: To investigate what happens when you change the distance between the object and the light source.**<br>*(Find patterns in the way that the sizes of shadows change)* | | | I can investigate how light enables us to see colours.<br><br>I can explain why shadows have the same shape as the object that cast them. |
| **Knowledge** | | | Know that we need light to see things.<br><br>Know some types of light sources – e.g – sun, lightbulb.<br><br>Know that light is reflected from surfaces such as the moon or a mirror.<br><br>Know that the light from the can cause damage to our eyes and skin.<br><br>Know that shadows are formed when a light source is blocked or partly blocked.<br><br>Know that placing an object in front of a light source creates a larger or smaller shadow. | | | Know that light appears to travel in straight lines<br><br>Know that light travels from a light source, bounces off an object and into our eyes.<br><br>Know different materials and objects all different amounts of light to pass through.<br><br>Know that a shadow will increase in size when the light source is further away.<br><br>Know that a periscope worked by rays of light reflecting through a mirror. |
| **Vocabulary** | | | Absence of light<br>shadow<br>reflect<br>light source<br>translucent<br>emit | | | Refraction, prism, optics, pupil, periscope.<br>Absence of light<br>shadow<br>reflect<br>light source<br>translucent |

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| **Physics - Sound** | | | | | | |
| **Key Questions** | | | | How does sound travel from a source to our ears?<br>What happens during this process?<br>How can you change the volume of a sound?<br>How does the strength of vibrations relate to the volume of the sound?<br>How does the type of material affect how well it blocks the sound?<br>What is the correlation between pitch and the object producing the sound? | | |
| **Sound** | | | | I can identify how sounds are made, associating some of them with something vibrating.<br><br>I can explore how sound travels.<br><br>I can find patterns between the volume of a sound and the strength of the vibrations that produced it.<br><br>I recognise that vibrations from sounds travel through a medium to the ear by exploring how high and low sounds are created. | | |

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| | | | | I can find patterns between the pitch of a sound and features of the object that produced it.<br><br>I can recognise that sounds get fainter as the distance from the sound source increases<br>**WS1: To investigate ways to absorb sound and recognise that vibrations from sound travels through the medium to the ear.** *(by making string telephones)*<br>**WS1: To investigate the best material for absorbing sound**. | | |
| **Substantive Knowledge** | | | | Know sound travels from its source in all directions and we hear it when it travels to our ears.<br><br>Know sound can be blocked.<br><br>Know sound spreads out as it travels.<br><br>Know the change in size, shape, and material of an object will change the sound it produces.<br><br>Know sound is produced when an object vibrates.<br>Know sound moves through all materials by making them vibrate. | | |

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| | | | | Know changing the way an object vibrates changes its sound.<br><br>Know bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds.<br><br>Know faster vibrations (higher frequencies) produced higher pitched sounds.<br><br>Know the further away from the source you are the quitter the sound. | | |
| **Vocabulary** | | | | vibration<br>sound wave<br>frequency<br>pitch<br>auditory<br>amplitude<br>high<br>low<br>loud<br>quiet | | |
| **Physics - Forces** | | | | | | |
| **Key Questions** | | | What is friction?<br><br>Why do magnets only attract some objects?<br><br>Which of these objects are magnetic? How do you know?<br><br>Which poles attract or | | What is gravity?<br>How was gravity discovered?<br>How do we measure a force?<br>Why does the length of a piece of paper affect the time it takes to fall?<br>How does the saltiness of the water affect the water resistance? | |

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| | | | repel in magnets? | | ---------- What is the most effective way to move an object? How can we use levers to lift heavy objects?<br><br>How can we use pulleys to lift heavy loads? | |
| **Forces** | | | **Forces and magnets**<br>I notice that some forces need contact between two objects.<br>**WS1: To investigate how a car moves over different surfaces**<br><br>I notice that magnetic forces can act at a distance and attract some materials and not others.<br><br>I can observe how magnets:<br>-Attract or repel each other<br>-Attract some materials and not others.<br><br>I can identify some magnetic materials.<br><br>I can predict whether two magnets will attract or repel each other. | | **Forces**<br>I can identify forces acting on objects *(explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object).*<br><br>I can explore the effects that gravity has on objects and how gravity was discovered<br>**WS1: To investigate the effects of air resistance** *(by investigating the best parachute to slow a person down).*<br><br>I can identify the effects of water resistance *(create and race streamline boats)*<br><br>I can identify the effects of friction.<br>**WS1: To investigate the effects of friction** *(investigate brakes on different materials)* | |

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| | | | | | I can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.<br><br>I can explore and design mechanisms. | |
| **Substantive Knowledge** | | | Know that friction is the resistance an object has when moving over a surface.<br><br>Know that a magnet will only attract objects which are magnetic.<br><br>Know that only some metals are magnetic.<br><br>Know how to sort magnetic materials from non-magnetic materials using a magnet to help me.<br><br>Know which poles in a magnet will attract and which will repel. | | Know that Gravity is a force that attracts objects towards earth.<br><br>Know how Gravity was discovered (Isaac Newton)<br><br>Know that other forces can act against gravity to slow or quicken an objects movement. (air resistance, water resistance)<br><br>Know the effects of water resistance (Balloon Push)<br><br>---<br><br>Know that some objects require large forces to make them move.<br><br>Know that some mechanisms can reduce the force needed to make things move. (gears, levers and pulleys) | |

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| **Vocabulary** | | | Attract/ repel<br>contract<br>friction<br>magnetic poles<br>contact force | | Air Resistance<br>Water Resistance<br>Gravity<br>Newton Metre<br>Balanced/Unbalanced<br>---<br>Levers<br>Gears<br>Pulleys<br>Mechanism<br>Machine | |
| **Physics – Seasonal Change** | | | | | | |
| **Key Questions** | What are the 4 main seasons?<br><br>What is the weather like in Summer, Autumn, Winter and Spring?<br><br>What is the weather like today?<br><br>How has the weather changed since last half term?<br><br>Why has it changed?<br><br>What are the signs of the seasons changing? | | | | | |
| **Seasonal Change** | **Seasonal Changes Autumn/Winter/Spring and Summer (to be delivered across the year)**<br>I can observe changes across the four seasons.<br><br>I can observe and describe weather associated with the seasons and how day length varies. | | | | | |

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| **Substantive Knowledge** | Know that there are 4 seasons; Summer, Autumn, Winter and Spring.<br><br>Know that the weather is hot in Summer.<br><br>Know that it is mostly sunny in Summer with few rain showers or rainclouds.<br><br>Know that the leaves turn brown and fall from the trees in Autumn.<br><br>Know that the weather is cooler in Autumn and it can often be cloudy.<br><br>Know that the weather is colder in Winter.<br><br>Know that snow and icy temperatures are common in winter.<br><br>Know that the temperature increases in Spring and the weather is warmer than winter.<br><br>Know that it often rains in Spring but is also sunny more frequently than in Winter.<br><br>Know that it is not safe to look directly into the sun.<br><br>Know how to record weather patterns and | | | | | |

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| | observations; e.g. on a weather chart. | | | | | |
| **Vocabulary** | Summer, Autumn, Winter, Spring, temperature, cloudy, rainy, hot, cold, icy, snow, sunshine, seasons, changes. | | | | | |
| **Physics - Electricity** | | | | | | |
| **Key Questions** | | | | What would life be like without electricity?<br>What sorts of things use/need electricity?<br>What electricity do we use?<br>In which ways can we get electricity? (mains/plugs/ batteries/wireless)<br>How do we make electricity?<br>How do batteries work?<br>How quickly can batteries run out? Does this make a difference depending on number of components?<br>How does the number of batteries added to the circuit affect a device?<br>What materials can carry electricity? (conductors/insulators) | | Who invented electricity and when was it discovered? (Greek's link)<br>What is static electricity?<br>What happens to the brightness of a bulb or buzzer when the voltage of cells is increased?<br>What are the recognised scientific symbols when representing a simple circuit in a diagram?<br>What happens to the components of a circuit when the length of the wire is changed? |
| **Electricity** | | | | I can identify common appliances that run on electricity.<br><br>I can identify a complete and incomplete circuit.<br><br>I can construct a simple series electrical circuit, identifying and naming its basic parts *including: Cells Wires Bulbs* | | I can explain the importance of the major discoveries in electricity.<br>I can explain and observe the effects of differing volts in a circuit.<br><br>I can associate the brightness of a lamp or the volume of the buzzer with the number and voltage of cells used in the circuit. |

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| | | | | *Buzzers Switches*<br><br>I can recognise some common conductors and insulators and associate metals with being good conductors.<br><br>I can recognise a switch opens and closes a simple series circuit and associate this with whether or not a lamp lights in a simple series circuit.<br><br>I can identify whether or not a lamp will light in a simple series of circuits, based on whether or not the lamp is part of a complete loop with a battery | **WS1: Electricity Investigation – investigate the relationship between the wire length and the brightness of the bulbs or the loudness of the buzzers** (*Compare and give reasons for variations in how components function including -*<br>*Brightness of bulbs*<br>*Loudness of buzzers*<br>*On/off position of Switches)* |
| **Substantive Knowledge** | | | | Know a source of electricity (mains or battery) is needed for electrical devices to work.<br><br>Know electricity sources push electricity round a circuit.<br><br>Know more batteries will push the electricity round the circuit faster.<br><br>Know devices work harder when more electricity goes through them. | | Know that the Greeks discovered static electricity.<br><br>Know that static electricity is a form of electricity that can be created without electrical equipment.<br><br>Know what a neutron, proton and electron is.<br><br>Know what an atom is.<br>Know that a bulb gets brighter and a buzzer gets louder when more voltage is added to a circuit. |

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| | | | | Know a complete circuit is needed for electricity to flow and devices to work.<br><br>Know some materials allow electricity to flow easily and these are called conductors. I know materials that don't allow electricity to easily through are called insulators. | | Know the scientific symbols used when representing a simple circuit in a diagram.<br><br>Know that bulbs will be dimmer and buzzers will be quieter if the wire length is increased. |
| **Vocabulary** | | | | circuits<br>electricity<br>circuit<br>improve<br>bulb<br>cell<br>crocodile clips<br>electric current<br>battery cell<br>switch<br>insulator<br>conductor<br>component<br>battery holder<br>mains<br>appliances | | Motor, symbol, components, voltage, series circuit. |
| **Physics – Earth and Space** | | | | | | |
| **Key Questions** | | | | | Why are Sun, Earth and Moon spherical?<br><br>What are the planets in our solar system?<br><br>How does Earth and other planets move in relation to the sun?<br><br>How do we get day and night? | |

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| | | | | | Why does shadow size change over the course of the day? | |
| **Earth and Space** | | | | | I can describe the Sun, Earth and Moon as approximately spherical bodies.<br><br>I can name and describe features of the planets in the solar system.<br><br>I can order the plants in the solar system.<br><br>I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.<br><br>I can explain day and night and the apparent movement of the sun across the sky.<br><br>I can explain the movement of the Moon relative to the Earth. | |
| **Substantive Knowledge** | | | | | Know that the Sun, Earth and Moon are approximately spherical.<br><br>Know what the planets in our solar system are made up of.<br><br>Know the order of the planets in our solar system.<br><br>Know the Earth revolves around the sun (365 days). | |

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| | | | | | Know the tilt of the earth whilst revolving gives us seasons.<br><br>Know that the sun is not moving across the sky.<br><br>Know that day and night are caused by the earth's rotation.<br><br>Know that the moon's movement dictates its phases. | |
| **Vocabulary** | | | | | Axis<br>Rotation<br>Orbit<br>Spherical<br>Solar System | |
| **Chemistry - Materials (Including properties and changes)** | | | | | | |
| **Key Questions** | What materials are made of wood/ metal/ glass in our classroom?<br><br>Why have these materials been chosen when making the resources? Why would we not make a chair out of glass? Why would we not make a boat out of fabric? Why would we not make a toilet door out of glass?<br><br>How can we group these objects?<br><br>What does 'waterproof' mean?<br><br>What does 'opaque' mean?<br><br>What does 'transparent' mean? | What is a material?<br><br>What are the different types of materials?<br><br>What properties do these materials have?<br><br>What can we use these materials for?<br><br>Where can we see these materials in our local area/around school?<br><br>What are the different ways we can change the shape of a material?<br><br>What is recycling?<br><br>How can materials be recycled? | How can we group rocks?<br><br>What does erosion mean?<br><br>How are fossils formed?<br><br>Who was Mary Anning?<br><br>What did Mary Anning discover?<br><br>What are the layers of soil?<br><br>How is soil formed? | What happens to liquids when it is heated/cooled?<br>Where do the drops of water come from?<br>What might affect the size of the drops of water?<br>The drops of water will not go on forming forever – why?<br>Can you think of other examples of evaporating?<br>What do you think would make a liquid evaporate more quickly?<br>What is the process called when a gas turns to a liquid? What is the process called when a liquid turns to a gas? | What are mixtures?<br><br>How can we separate mixtures?<br><br>What does dissolve mean?<br><br>Which sweets will dissolve in water?<br><br>How can we clean dirty water? | |

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| | What are the properties of metal/ glass/ rock/ water/ wood etc?<br><br>Why is it important to recycle? | | | | | |
| **Chemistry**<br><br>**Materials (Including properties and changes)** | **Everyday materials**<br>I can distinguish between an object and the material which it is made.<br><br>I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.<br><br>I can describe the simple physical properties of a variety of everyday materials.<br><br>I can compare and group together a variety of everyday materials on the basis of their simple physical properties<br>**WS1: Umbrella Investigation**<br><br>I can observe and perform simple tests to find out which material would be suitable to make an umbrella from. | **Everyday Materials**<br>I can identify and compare the suitability of a variety of everyday materials, including their uses-<br>*Wood Metal*<br>*Plastic Glass*<br>*Brick Rock*<br>*Paper Cardboard*<br>I can identify and classify the use of everyday materials.<br><br>I can investigate how the shapes of solid objects made from some materials can be changed *by -*<br>*Squashing Bending*<br>*Twisting Stretching*<br><br>I can explain the process of recycling and how materials can change shape during this process. | **Rocks and soils (Including fossils)**<br>I can compare and group together different kinds of rocks on the basis of their appearance.<br><br>I can group together different types of rocks based off their physical properties.<br><br>I can describe how erosion occurs on rocks through water flow.<br><br>I can describe how fossils are formed when things that have lived are trapped within rocks.<br><br>I can explain Mary Anning's contribution to palaeontology.<br><br>I can recognise that soils are made from rock and organic matter and explain how this is formed.<br>**WS1: To investigate the permeability of different soils.**<br><br>I can observe and record findings from enquiries, | **States of matter**<br>I can compare and group materials together, according to whether they are solids, liquids or gases.<br><br>I can investigate gases and their uses.<br>**WS1: To investigate how heating and cooling can change the materials state** *(chocolate with different temp water)*<br><br>I can observe that some materials change state, measure or research the temperature at which this happens in degrees Celsius (°C)<br>**WS1: To investigate how heating and cooling can change the materials state***(explore how water changes state)*<br><br>I can observe that some materials change state, measure or research the temperature at which this happens in degrees Celsius (°C)<br><br>I can identify the part played by evaporation | **Properties and changes of materials**<br>I can compare and group together everyday materials on the basis of their properties *eg: Solubility*<br>I can use different processes to separate mixtures of materials, including filtering, sieving and evaporating.<br><br>I can demonstrate that dissolving, mixing and changes of state can be reversible changes.<br><br>I can describe how to recover a substance from a solution.<br><br>I can explain irreversible changes *(explain that some changes result in the formation of new materials.*<br>*•The formation of new materials is not usually reversible including changes associated with –*<br>*Burning*<br>*Action of acid on bicarbonate of soda)* | |

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| | | | including presentation of results and conclusion. | and condensation in the water cycle.<br>**WS1: To investigate how water evaporates** *(the effect of temperature on drying washing)*<br><br>I can identify and describe the water cycle. | | |
| **Substantive Knowledge** | Know the names of common materials (wood, plastic, glass, metal and rock).<br><br>Know and name the material(s) that an object is made of (e.g. a toy, table, pencil pot).<br><br>Know how to describe materials based upon their properties, such as hard/soft, stretchy/stiff, shiny/dull, rough/smooth, bendy/not bendy, opaque/transparent.<br><br>Know that if a material is waterproof, this means that water cannot pass through it and the object keeps water out.<br><br>Know that different materials are more suitable for different resources.<br><br>Know that objects can be grouped based upon their properties and materials that they are made from. | Know what a material is<br><br>Know the name of everyday materials such as wood metal plastic glass fabric paper rock<br><br>Know the properties of everyday materials such as, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not bendy, absorbent, not absorbent, waterproof, not waterproof, transparent, opaque<br><br>Know materials that familiar objects are made from<br><br>Know what 3 different materials can be used for.<br><br>Know which properties make some materials suitable for different purposes.<br><br>Know how the shapes of objects made from some materials can be changed. | Know the names of the three types of rock – igneous, sedimentary and metamorphic.<br><br>Know rocks can be grouped according to their type - igneous, sedimentary and metamorphic.<br><br>Know how water erodes rocks over time.<br><br>Know how fossils are formed when things that have lived are trapped within rocks.<br><br>Know who Mary Anning is and can explain her major discovery.<br><br>Know soils are made from rock and can explain and name the layers of soil. | Know solids, liquids and gases are described by observable properties.<br><br>Know materials can be divided into solids, liquids and gases.<br><br>Know particles in solids are fixed.<br><br>Know particles in liquids are fluid and move around together.<br><br>Know particles in gases float about freely.<br><br>Know when liquid evaporates it turns into water vapour.<br><br>Know the water cycle involves areas of water being heated by the sun and turns to water vapour. This then rises and cools down, changing it to water droplets in clouds (condensation). When the droplets get too heavy they fall back | Know about reversible and irreversible changes.<br><br>Know that some changes can be reversed and some cannot.<br><br>Know that you can filter, sieve or evaporate to separate mixtures.<br><br>Know how to recover a substance from a solution. | |

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| | | Know 4 ways the shapes of some objects can be changed.<br><br>Know what recycling is<br><br>Know the process of recycling<br><br>Know how materials are sorted and changed into new products<br><br>Know the reasons why it is important to recycle | | to earth as rain, sleet or snow (precipitation). | | |
| **Vocabulary** | Materials, glass, wood, plastic, fabric, foil, metal, rock, brick, opaque, transparent, stretchy, stiff, shiny, dull, rough, smooth, properties, waterproof. | wood, plastic, glass, metal, rock, brick, paper, cardboard, uses, used, properties, hard, soft, stretchy, stiff, shiny, dull, rough, smooth, bendy, not bendy, absorbent, not absorbent, waterproof, not waterproof, transparent, opaque | Igneous<br>Sedimentary<br>Metamorphic<br>strata<br>Comparative test | solid<br>liquid<br>conclude<br>change of State<br>gas<br>liquid<br>predict<br>particles<br>melt<br>freeze<br>properties<br>water<br>ice<br>temperature<br>process<br>condensation<br>evaporation<br>water vapour<br>energy<br>precipitation<br>collection | Reversible<br>Irreversible<br>Filtering<br>Sieving<br>Dissolve | |
| **Year Group Themes to cover** | Y1<br>Plants<br>Animals including humans<br>Seasonal change<br>Everyday materials | Y2<br>Plants<br>Animals including humans<br>Everyday Materials<br>Living things and their habitat | Y3<br>Plants<br>Animals including humans<br>Light<br>Forces and magnets | Y4<br>Animals including humans<br>Living things and their habitat<br>Sound<br>Electricity | Y5<br>Animals including humans<br>Living things and their habitat<br>Forces and magnets<br>Earth and Space | Y6<br>Living things and their habitat<br>Evolution and Inheritance<br>Light<br>Electricity |

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| | | | Rocks | States of matter | Properties and changes of materials | |