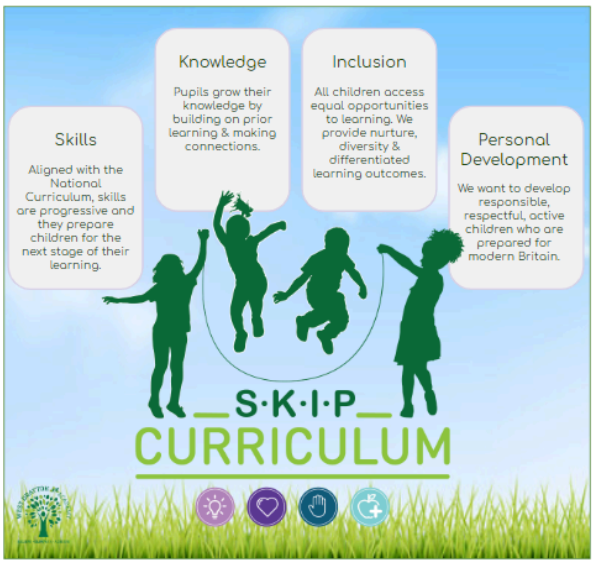
West Drayton Academy

Believe • Empower • Achieve

Ofsted GRADED GOOD

# SCIENCE CURRICULUM

# INTENT




**Introduction to SKIP**

Our curriculum has been designed to create a balance between the National Curriculum statutory requirements and a range of experiences and opportunities which best meets our children's learning and developmental needs.

The key principles that underpin our curriculum are known as 'SKIP' - skills, knowledge, inclusion and personal development.

S - Using 'working scientifically' skills such as asking questions, observing and measuring and interpreting and communicating results to progress through the Science curriculum from EYFS to Y6.

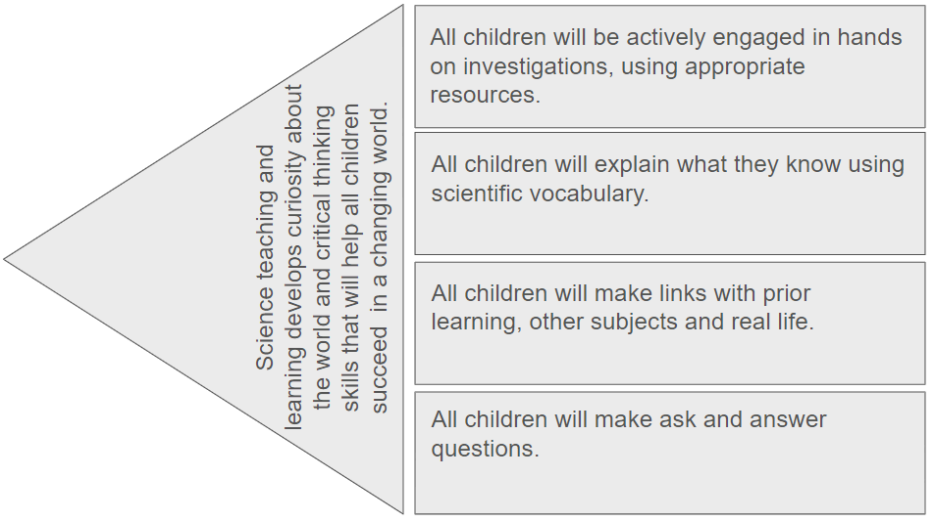
K - Each topic is planned so that children develop their knowledge and understanding of biology, chemistry and physics through scientific enquiry.

I - All children have access to the learning through adaptation, which provides them with a diverse and differentiated curriculum.

P - Our aim is to develop responsible, respectful, active children who are prepared for modern Britain. Our lessons enable pupils to build their sense of identity and belonging, which helps them thrive within their communities and as citizens in our diverse society. It teaches pupils to develop respect for others.

**Intent for Science**

At West Drayton Academy our intention is for all children to develop a strong foundation of knowledge for understanding the world around them. This is underpinned by our Science Vision and Principles (see image below), created with staff by identifying what Science teaching and learning looks like. It links directly to the school's S.K.I.P approach. Children's curiosity and excitement is encouraged and supported through hands-on learning. Children will grow confident and competent in the practical skills associated with Science as a process of inquiry, including generating questions, taking risks, making and learning from mistakes - understanding that scientific discovery is not a linear process. Through the planning and carrying out of the six investigation types, children know how to use a range of equipment competently and confidently, and begin to make appropriate choices in the setting up of their own investigations. They are able to explain, predict and analyse using appropriate scientific vocabulary, developing critical thinking skills.



# LONG TERM OVERVIEW

West Drayton Academy
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Plymouth Science

| Year Group | Unit Coverage | | | | | |
|---|---|---|---|---|---|---|
| | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** ***Science Week*** |
| **EYFS** | The Human Body | Materials | Materials | Minibeasts and Growing | Minibeasts and Growing | Consolidation |
| **Year 1** | Materials | Seasonal Changes | Animals including humans | Animals including humans | Plants | Plants Consolidation |
| **Year 2** | Living things and habitats | Materials | Animals including humans | Animals including humans | Plants | Plants Consolidation |
| **Year 3** | Rocks | Animals including Humans | Light | Forces and magnets | Plants | Plants Consolidation |
| **Year 4** | Animals including humans | Sound | States of matter | Electricity | Living things | Living things Consolidation |
| **Year 5** | Forces | Properties of materials | Space | Living things and habitats | Animals including humans | Animals including humans Consolidation |
| **Year 6** | Animals including humans | Living things and habitats | Electricity | Light | Evolution and Inheritance | Evolution and Inheritance Consolidation |

# IMPLEMENTATION

## Curriculum Design

Plymouth Science

At West Drayton Academy we use the **'Plymouth Science**' schemes of work as a basis for Science teaching which follows the National Curriculum statements for Knowledge, Working Scientifically and Scientific Enquiry. All children from EYFS to Year 6 access this curriculum. Links are made to other subject areas where possible. The Plymouth Curriculum ensures children are engaged in hands-on learning in each lesson through one of the six main **enquiry types**. At WDA children become familiar with the enquiry types through discussion at the beginning of each lesson and indicated on their **Learning Intention.** A range of '**working scientifically' skills** are developed across lessons through investigations and experiments; these skills are developed across topics and year groups. Children are exposed to scientific **vocabulary** through teaching models, simulations and videos. Children practise using vocabulary in written explanations and investigation evaluations, developing their independence through cloze procedure and matching activities.

# SKILLS

The skills progression outlined in the Plymouth scheme of learning is aligned with the National Curriculum statements regarding 'Working Scientifically'. These skills are embedded within the content of biology, chemistry and physics, focussing on the key features of scientific enquiry, so that pupils use a variety of approaches to answer relevant scientific questions. These types of enquiry include those outlined by the National Curriculum and shown above. Pupils seek answers to these questions through collecting, analysing and presenting data. Skills for each key stage are broken down into small steps which prepare children for the next stage of their learning.

| **Progression of Disciplinary Knowledge - Working Scientifically** | | | | | | | |
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| | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Asking Questions**  | Question why things happen. Ask questions to find out how things work. | Can ask simple questions. Can ask yes and no questions to sort and classify. Can raise own questions. | Can ask simple questions relevant to the topic. Know their questions can be answered in different ways. Can use a range of question stems. | Can raise questions and can carry out tests with support to find things out. Can write a range of questions relevant to the topic. Can answer questions posed. | Can ask a range of questions to sort and classify. Can write a range of questions using own scientific knowledge. Can answer questions independently using secondary sources. | Use scientific experiences to explore ideas and raise different higher order questions. Can create further questions to investigate. Can raise questions and suggest reasons for similarities and differences | Can raise questions to further prove or disprove a scientific enquiry. Can raise questions about a range of phenomena. |
| **Make predictions**  | Can make simple predictions based on comparisons e.g. float or sink. | Can make basic predictions over things they can see or their own ideas. Use some scientific vocabulary. | Draws knowledge from observations to make predictions. Can begin to test predictions and later answer questions. | Draws on knowledge to make predictions. Can add detail to their predictions. Make further predictions based on what's observed or tested. | Predictions are detailed and explain their thinking, they link to tests, data and use scientific language. Raise further predictions from | Use subject knowledge, observations or previous learning to make predictions. Add detail and explanations. Can identify a range of | Use test results to make predictions to set up further comparative tests. Uses evidence to support predictions. Develop predictions based on research and scientific knowledge. |

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| | | | | | results based on patterns. | variables which could affect their investigations. | |
| **Observation and Measurement** | Observe and describe what they see using everyday language. Use equipment such as magnifying glasses and viewers. Take measurements by comparing and notice simple patterns e.g. bigger/smaller. | Can identify and group, compare and contrast using observations, video and photographs. Can observe changes over time and describe changes. Can use magnifying glasses, viewers and digital microscopes. Use simple measurement and equipment such as egg timers and stopwatches. Use non-standard measures. | Observe closely and select the correct equipment. Can identify a range of plants using ID charts. Observe how plants and animals grow and record findings. Notice similarities and differences. Use observations and ideas to suggest answers to questions. Use standard units to estimate and measure. Use rulers, scales, thermometers and measuring vessels with a degree of accuracy. | Make systematic and careful observations. Select your own equipment for observing including digital cameras. Look for naturally occurring patterns. Collect data from your own observations. Can make observations and decide how to record them to answer a question. Take accurate measurements using standard units. Use a range of equipment and begin to read digital measurements from data loggers and stop watches | Make systematic and careful observations to ask questions and group objects using classification keys. Observe closely and explain processes. Identify similarities, differences or changes related to simple scientific ideas or processes. Take and record accurate measurements using standards units to 2dp. Use data loggers to record. Use volt metres and begin to gather repeat readings to increase accuracy. | Observe carefully and make comparisons. Observe changes over a period of time. Make decisions about what to observe to answer questions. Use observation skills and ID kits to identify plants and animals. Take repeat measurements where appropriate. Can find the average of data. Select measuring equipment and use accurately e.g. ruler, tape measure, trundle wheel, force metres. | Can make accurate drawings of plants and animals based on observations. Take measurements using a range of scientific equipment with increasing accuracy and precision, taking repeat readings where appropriate. When collecting measurements decide whether to increase sample size for validity and reliability. Record measurements to 3dp. Use protractors, rulers, force metres, volt metres accurately |
| **Planning enquiries** | Test out ideas and take risks through trial and error. | Begin to recognise ways they may answer scientific | Can plan and carry out simple tests linked to the different | Can set up practical enquiries using comparative and | Can identify the type of enquiry needed to answer a | Recognise when and how to set up comparative and fair tests | Children choose the type of enquiry needed to carry out their investigation. |

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| | Engage in open ended activities. Choose resources they need for their activity from their environment. Find ways to solve problems. | questions. Experience different types of enquiry including practical activities. Use resources provided by the teacher and suggest some resources of their own e.g. pipettes. | types of enquiry. They can carry out a simple comparative test using some of their own ideas. Can suggest their own resources to carry out tests. | fair tests. Use a range of scientific enquiry. Can investigate and answer questions linked to a shared planning frame. Understand some of the variables needed to be controlled with support. Use a range of equipment e.g. thermometers and data loggers. | question. Follow a plan to carry out observations and tests. Use a planning approach with more independence identifying variables and what needs measuring. Children choose their method to carry out their investigation. | and explain which variables need to be controlled and changed. Understand what type of scientific inquiry is needed to answer and prove/disprove scientific questions or phenomena. | Children can pose and answer their own questions, controlling variables where necessary independently. Decide whether sample size needs to be increased for validity. Identify a range of factors which may affect their investigation. |
| **Recording** | Draw pictures or objects in their own environment. Can take photos of things that interest them. Can count results and start to make marks to record results. Can sort in at least 2 groups. Can create a class pictogram using pictures and objects. | Begin to show some accuracy in drawings, observations and use simple labels. Use scientific vocabulary provided by the teacher. Can complete a simple prepared table with some support and scaffolding. Can add marks to a chart to complete data. | Gather and record data to help answer questions. Record observations using photo video, drawings, labelled diagrams or in writing. Count results using tally charts. Use prepared tables to record results more independently. Use simple keys based on yes and no questions. Can sort into 2 groups with their own categories | Record findings using scientific language, drawings and labelled diagrams including detailed labelling and written explanations based on observations. Can complete a table where they can add their own headings and results. Use simple classification keys and Venn diagrams. Can use Carroll diagrams and | Record findings using systematic and careful observational drawings and labelled diagrams using scientific vocabulary. Children present the same data in different ways. Can create own tables with headings. Can record using classification keys. Can use Venn and Carroll diagrams with accuracy. Can use discrete and continuous data | Present results in a variety of ways to help answer questions. Can decide how to record from a range of approaches. Can record ideas using accurate diagrams using scientific language. Create your own results table including cause and effect. Record results systematically and repeat readings. Use | Record data and results with increasing complexity e.g. accuracy of measurements. Use scientific diagrams, models and labels accurately with clarity and using precise scientific language. Calculate mean and rage of a set of data. Can use and produce classification keys independently by posing questions. Can independently collect data and produce scatter and line graphs. Can |

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| | | | and explain the reason for choices. Record using prepared bar charts. | give reasons for criteria. Can produce bar charts adding their own axis labels and headings. | using line/scatter graphs. Can construct bar charts independently. | and develop classification keys. Can classify in a number of ways. Use line or scatter graphs to calculate range in a set of data using different scales. Can produce line graphs with various increments. | create bar charts and pie charts to present data. |
| **Interpreting and concluding** | Offer explanations for why things happen- making use of some recently introduced scientific vocabulary. Develop your own narrative and explain by connecting ideas or events. Develop vocabulary which meets the breadth of their experiences. | Can use evidence from simple tests when answering questions. With help, begin to notice patterns and relationships. Talk about what they have found out and how they found it out. Can make comparisons and recognise biggest/smallest, most effective/least effective from data. Can use simple models to explain processes e.g. | Communicate findings to an audience using relevant scientific language and illustrations. Can identify causal relationships and patterns in results. Can identify which results do not fit the overall pattern and explain findings. Refers to the table of results when describing what has happened. Draws a basic conclusion (with support from the teacher) using | Draws conclusions based on observations. Can compare something using results and the conclusion is consistent with the data. Able to adjust opinion and predictions based on results. Can give reasons for results including any anomalies. Use simple scientific language to discuss ideas and communicate their findings in ways appropriate for different | Draws simple conclusions from results to answer questions and support their ideas. Look for casual relationships in data and identify evidence that refutes/supports ideas. Report on findings to an audience orally and in writing using appropriate scientific vocabulary for a range of audiences. Children use evidence to suggest values | Identify patterns and casual relationships that may be found in the natural environment. Children interpret data to generate simple comparative statements based on evidence. Use results to draw conclusions and can identify external factors that cannot be controlled e.g.temperature inside and outside. Use scientific language and | Look for patterns and relationships using a suitable sample. Use oral and written forms such as displays to report conclusions, casual relationships and give an explanation of the degree of trust in their results. Makes suggestions for ideas that can be explored using pattern seeking. Can spot anomalies and identify results that do not fit the overall pattern. Use data to refute or support ideas or arguments. Focuses on scientific reasons for overall pattern rather than a |

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| | | seasonal changes, lifecycles. | own scientific knowledge, observations and comparisons. Uses results of investigations to answer enquiry questions. | audiences orally and written | for different items tested using the same method. Draw conclusions based on straightforward evidence and current subject knowledge to support their findings, Suggest improvements and raise further questions. | illustrations to discuss, communicate and justify scientific ideas. Can use comparative statements to explain results and how things work. | comparison. Uses labelled diagrams to support their explanation. Use ideas from secondary sources to support their ideas, choosing appropriate websites.Create detailed models to explain processes such as circulatory systems and lifecycles. |
| **Evaluating** | | | | Apply their knowledge of the topic when evaluating. Explain any amendments and how this impacted the investigation/test. | | Evaluate how effectively variables were controlled and what they may do to improve the enquiry. | |

# KNOWLEDGE

The programmes of study taken from the National Curriculum describe a sequence of knowledge and concepts that develop pupils' scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. The spiral nature of the Science curriculum ensures that knowledge is revisited during children's learning journey, providing students with multiple opportunities to reinforce their understanding and retention of material, allowing for deeper understanding of topics. Teachers are supported in making these connections and deepening understanding through the use of Plymouth Science, which builds on knowledge gained at the previous stage of learning and provides opportunities to revisit and revise learning. Pupils are given opportunities to describe associated processes and key characteristics in common language, and use technical terminology accurately and precisely. They also apply their mathematical knowledge to their understanding of science, including collecting, presenting and analysing data.

| Overview of Substantive Knowledge Journey | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Animals, including humans** | | | | | | | |
| **Plants** | | | | | | | |
| **Living things and their habitats** | | | | | | | |
| **Evolution and inheritance** | | | | | | | |
| **Seasonal changes** | | | | | | | |
| **Forces** | | | | Forces and magnets | | | Forces |
| **Light** | | | | | | | |
| **Sound** | | | | | | | |
| **Earth and space** | | | | | | | |
| **Electricity** | | | | | | | |
| **Materials** | | Everyday Materials | Uses of everyday materials | Rocks | States of matter | Properties and changes of materials | |

| Progression of Substantive Knowledge | | | | | | | |
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| | **EYFS** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| Plants (Biology) | Make observations and drawings of plants<br>Know similarities and differences between the natural world and contrasting environments<br>Can plant seeds and care for growing plants.<br>Understand the basic plant life cycle.<br>Know leaf, stem, petals. | Can name common plants and describe the basic parts of flowering plants (deciduous/evergreen)<br>Can describe key features of trees and plants e.g. shapes of leaves, colour of flower, blossom.<br>Can use photos to talk about how plants change.<br>Can talk about plant life cycles.<br>Know basic parts of plants e.g. leaf, stem, petal, flower, stalk, bud, roots, fruit, bark, blossom. | Can describe how plants have grown from seeds and bulbs and how they have developed over time.<br>Know conditions for plant growth.<br>Can spot similarities and differences in bulbs and seeds.<br>Confident in ordering parts of the plant life cycle.<br>Know all parts of the plant and their function.<br>Know the terms: light, shade, sun, warm, grow, healthy, growth, germinate. | Can explain the function of the parts of a flowering plant.<br>Can explain the life cycle of a flowering plant lifecycle including pollination, seed formation, seed dispersal and germination.<br>Know different methods of seed dispersal.<br>Know the requirements of plant growth and how water is transported through the plant. Know how the sun helps plants photosynthesis.<br>Know the terms: photosynthesis, pollen, pollination, absorb, nutrients, reproduce, germination, stamen and style. | Can classify plants in different ways (Living things) | Can explain the life cycles and processes of a range of different plants and trees.<br>Can use ID guides to identify plants. (Living things) | Can classify plants in different ways using observable characteristics/ similarities and differences. Give reasons for classifying plants based on characteristics (Living things) |

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| Animals, including humans (Biology) | Can name a range of animals e.g. farm/jungle.<br><br>Can group using basic characteristics e.g. land/sea, 4 legs, can fly/can't fly.<br><br>Can name and point to different body parts e.g. head, body, tummy, knees, legs, arms, toes, eyes, ears, mouth, nose, hair, fingers.<br>Know basic senses e.g. touch, taste, hear, see. | Can name a range of animals which include animals from each of the vertebrate groups.<br>Understand and categorise animals who are herbivore, carnivore and omnivore.<br>Describe and compare animals based on observable characteristics.<br>Know the terms: reptile, amphibian, mammal.<br>Can name, draw and label parts of the human body and say what sense is associated.<br>Can name the 5 senses. | Can describe how animals change as they get older. Know names of animals and their offspring e.g. goat- Kid.<br>Can order the lifecycle of different animals e.g. butterflies.<br>Can explain what humans and animals need to survive e.g. food, sleep, exercise, water, shelter.<br>Know about microorganisms and how to keep hygienic.<br>Understand the term balanced diet and can identify some food groups.<br>Understand the effects of exercise on the body.<br>Know the terms: offspring, nutrition, reproduction, exercise, hygiene, microorganism, germs. | Can name the main bones in the skeletal system such as skull, ribs, humerus, vertebrae, pelvis, ulna, carpals, radius, femur, phalanges, patella, tibia, tarsals, fibula, metatarsals.<br>Know the function of the skeletal system.<br>Can describe how muscles and joints help to move.<br>See similarities and differences in skeletons can classify into endoskeleton, exoskeleton and hydrostatic skeleton.<br>Can name different nutrients found in food.<br>Know the different food groups and why we need to eat a balanced diet. | Can identify and label and draw main parts of the digestive system and explain the process.<br>Know the different types of teeth in their mouth: molars, premolars, canines and incisors and their function. Can identify animals and classify based on their teeth whether they are herbivore, omnivore and carnivore.<br>Can order and draw a range of lifecycles and food chains.<br>Can identify the producer, predators and prey. | Can explain the changes that take place in boys and girls during puberty.<br>Can explain how a baby changes physically as it grows and what it is able to do at each stage.<br>Understand that different animals have different gestation periods.<br>Know the importance of physical and mental health. | Can identify, label and draw parts of the circulatory system e.g. heart, blood vessels, capillaries, arteries, blood.<br>Understand the function of the different parts.<br>Understand how nutrients are transported around the body within animals and humans.<br>Know the impact of a balanced diet, exercise and lifestyle on the way their body's function.<br>Recognise the impact on all body systems learned so far. |

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| Living things/ Evolution and inheritance (Biology) | Can name some plants and animals.<br>Can explore habitats and know where some animals live.<br>Can compare and describe plants and animals. | Know common plants and trees (plants)<br>Identify and name common animals (animals)<br>Know herbivore, carnivore and omnivore (animals)<br>Describe and compare variety of animals (animals) | Can find a range of items which are dead, living and never been alive.<br>Know what a habitat and microhabitat is and identify animals which live in different habitats. Can talk about features of animals and plants and how they are suited to live in particular habitats.<br>Can construct a simple food chain using terms producer, prey, predator, energy.<br>Can identify different sources of food and understand where food comes from. | Identify and describe functions of different plants. (Plants)<br>Identify and describe different animals and how they are adapted to live in different environments.<br>Understand the term climate (Animals)<br>Can explain how a fossil is formed (Rocks). | Can name living things in a range of habitats, giving key features that helped identify them. Can give examples of how an environment might change both naturally and due to human impact.<br>Explain how changes in the environment can be dangerous to animals and lead to extinction.<br>Know that some animals hibernate. | Describe the life cycles of mammals, amphibians and insects using diagrams. Can describe similarities and differences between them.<br>Understand the term reproduction in plants and animals. | Can give examples in the five vertebrate groups and some in the invertebrate group. Can give key characteristics of these groups.<br>Can give examples of flowering and non-flowering plants. Can identify unknown plants using ID and classification charts. Can explain why animals belong to groups. Know that Carl Linnaeus classifies plants and animals.<br>Can explain the process of evolution and give examples of how plants and animals are suited/adapted to their environment.<br>Give examples of how animals have evolved over time.<br>Understand that |

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| | | | | | | | fossils give us evidence of the past and know the process of fossilisation. |
| Seasonal Changes (Biology)<br>Earth and Space (Physics)<br>Light/Sound (physics) | Know the four seasons<br>Can experience different seasons and describe how they feel.<br>Can comment on the environment e.g. leaves on the ground. Can name some clothes they may wear.<br>Know some weather e.g. rain, wind, sun, snow, cloud.<br>Understand the terms night/day | Can name the four seasons and identify in the year when they occur. Can observe and describe the weather in different seasons. Can describe days being longer in summer and shorter in winter.<br>Compare seasons. | Know that the sun rises and sets.<br>Understand that we have night and day.<br>Know why the sun helps plants grow. (plants)<br>Know that it is dangerous to look at the sun (animals) | Light- Can describe how we see objects in light and describe dark as the absence of light. Know it is dangerous to look at the sun.<br>Understand the term ultra violet.<br>Know the terms transparent, translucent and opaque. Can describe how shadows are formed Predict which materials will be more/less visible. Know the term reflective and why reflective materials are useful. | Sound- Can describe different types of objects producing different sounds.<br>Know that sound is caused by vibrations. Can describe how sound travels through different mediums e.g air, water, metal.<br>Can find patterns between pitch and volume and the features of the objects producing it.<br>Know that sounds get fainter as the distance from the sound increases. | Earth and space- Know how the earth and moon move.<br>Know different planets in the solar system.<br>Can understand night and day by explaining the rotation of the earth on its axis.<br>Understand why shadows change using scientific vocabulary and the position of the sun. Can explain how a sundial works.<br>Can explain why we have time zones. | Light- Can describe using diagrams how light travels in straight lines, either from sources or reflected from other objects into our eyes. Can explain how we see things and can label basic parts of the eye and explain their function. Can describe with diagrams how light travels past translucent or opaque objects to form shadows of the same shape. Know how to change the size of shadows by moving objects closer/further from light source. |

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| Materials (Chemistry)<br><br>Rocks (Chemistry) | Can talk about the similarities and differences between materials. Can describe using basic words. They can group materials based on how they feel or look like. | Can label a picture of an object based on what it is made of. Can describe the properties of materials. Can sort materials using its properties. Know the terms: wood, plastic, glass, metal, water and rock. | Compare the suitability of different materials including wood, metal, plastic , glass, brick, rock, paper, cardboard, water. Know that shapes of solid objects can be changed by squashing, bending, twisting and stretching. Can describe similarities and differences. | Compare and group types of rock and give physical features of each. Explain how a fossil is formed. Explain that soils are made from rocks and also contain living/dead matter. Classify rocks in a variety of ways using scientific vocabulary. Test properties of rocks. Describe materials using transparent, translucent and opaque. | Can name properties of solids, liquids and gases. Can explain the process of melting and freezing. Know the terms evaporation and condensation. Can describe the water cycle. Know the materials have different melting points. Can test a variety of materials to answer questions. | Can explain everyday uses of materials. Can explain what dissolving is. Can name equipment for filtering and sieving. Know how to recover substances from solutions or mixtures by evaporation, filtering or sieving. Can describe reversible and non-reversible changes to materials and give examples. | Recognise that things have changed over time and fossils provide information about living things that inhabited the Earth millions of years ago. (Evolution and Inheritance) |
| Forces (Physics)<br><br>Electricity (Physics) | Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images. Understand push and pull. | Understand the terms push and pull. Can move objects by applying a force such as pushing a car. | Know how different materials can be changed by applying a force such as squashing, bending, twisting and stretching. | Compare how things move on different surfaces. Can give examples of forces in everyday life. Name a range of magnets. Know that magnets have a north and south pole. Can show how the poles attract and repel. Can draw | Electricity- can name the components in a circuit. Can make a simple circuit. Can control a circuit using a switch. Can name some conductors and insulators. Can use drawings to represent their circuits. Can describe how a | Can explain the effects of gravity acting on an unsupported object. Can give examples of friction, water resistance and air resistance. Can give examples of the benefits of high/low friction, water resistance and air | Understand different forces and can apply this knowledge across different subjects e.g. geography. Electricity- Understand voltage and amps. Know how to make bulbs brighter, buzzers louder. Can label and name |

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| | | | | diagrams to show the attraction and repulsion between poles of magnets. Can name magnetic and non-magnetic materials. | circuit works. Can name some appliances that run on battery/mains. Know how to make a bulb brighter. | resistance. Can demonstrate how pulleys, levers and gears work. Know that these systems can make lifting heavy objects easier. | components in a circuit. Can draw circuits using symbols. Make circuits to solve particular problems such as a quiet and a loud burglar alarm. |

# Plymouth Progression of Learning

Plymouth Science

| | Foundation/ EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| This is what our scientists can do…. | Children will ask questions about the environment including the weather outside. They will be able to suggest what they might wear. They will develop an understanding of growth, decay and changes over time and show care and concern for living things and the environment. They will use their senses when walking around and investigating. They will develop questioning and curiosity through play and understand the concept of forces and electricity through twisting, pushing, slotting and magnetic toys and seeing the effects of pushing different buttons to make sounds and movements. They can talk about similarities and differences between living things and materials and make simple observations about animals. | Children will be asking questions about the local environment including plants and animals found there including how they can look after them. They will observe and talk about the weather and changes. They will explore different materials using scientific language to describe them. | Children will be asking questions about the local environment including discussing how plants grow, survive, germinate and reproduce. They investigate different habitats (incl. micro) and observe how different animals depend on each other and its life processes. They understand basic needs of animal survival including exercise and nutrition. They can identify properties of materials and state why they are suited to purpose. They can name some scientists who have developed new materials. | Children will be asking questions about the local environment and using their observation skills to identify parts of a flower and know how water transports around the plant. Children will understand the lifecycle of a plant by drawing diagrams and using research to find the function of each part. Children will know that humans and animals have skeletons and understand why. They know how humans get nutrients. They will carry out comparative and fair tests to compare and classify rocks and soils based on their properties. | Children will be asking questions about the local environment and observe how the environment can change along with the dangers this can cause. They will understand the functions of the teeth and the importance of oral hygiene. Children will know about how the digestive system works. Children will be grouping, identifying and classifying living things and materials and using classification keys. Children will understand the water cycle and effect of heat with evaporation and condensation as well as materials changing state. Children will use representations to understand how we hear through vibrations and know how to create simple circuits including a switch. Comparative and fair tests will be used to test conductivity of materials. | Children will understand the changes that occur in humans from birth to old age and understand reproduction in plants and animals. They explore different lifecycles and can understand the similarities and differences between mammals, amphibians, insects and birds. Children will be able to explain the uses of everyday materials and describe some reversible and irreversible changes. They will be able to present their results from fair tests using tables and charts. Children will use diagrams to show the movement of the Earth and the moon and can explain how different time zones occur. They explain day and night. They will have an understanding of forces including gravity, air resistance, water resistance and friction. They will be able to mechanisms such a levers, pulleys and gears to explain forces and making jobs easier. | Children will understand how the circulatory system works and will be able to use this to explain the positive and negative effects of diet, exercise, drugs and lifestyle on the body. They will be able to recall animals from the 5 vertebrate group and some from non-vertebrate groups including their key characteristics. They will understand how plants and animals are suited to their environment and the process of evolution. Children will be able to use classification keys to identify unknown plants. They will know what fossils are and can use research and observations to show that things lived billion years ago. Children will use diagrams to explain how light travels and understand shadows. They will be able to make simple circuits using recognised symbols in their drawings. They can conduct a range of fair tests identifying cause and effect when testing brightness of a bulb or volume of a buzzer. Children will be able to conduct a range of investigations with accuracy using repeat measurements and using a range of equipment. They will use scientific theory to refute or support their arguments. |
| **Year Group** | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| **Plants** | **Natural world**<br>Explore the world around them making | • Name common plants and describe the basic structure of flowering | • Observe and describe how seeds and bulbs grow into mature plants. | • Identify and describe the functions of different parts of flowering plants: | Recognise that living things can be grouped in a variety of ways. | Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird. | 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 |

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| | observations and drawings of plants.<br><br>**Natural world**<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.<br><br>**Communication and language**- express their ideas and feelings about their experiences using full sentences. | plants, including deciduous and evergreen.<br><br>• Identify and describe the basic structure of a variety of common flowering plants, including trees.<br><br>  | • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.<br>•<br>  | roots, stem/trunk, leaves and flowers.<br>• 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.<br>• Investigate the way in which water is transported within plants.<br>• Explore the part that flowers play in the life cycle of flowering plants, uding pollination, seed mation and seed persal.<br>  | (living things and habitats) | (Living things and habitats) | .<br><br>(Living things and habitats) |
| Key vocabulary | Plant, leaf, stem, flower, grow, rain, sun, water, soil, seed, | Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud.<br>Names of trees in local area, garden and wild flowering plants. | As year 1+ light, shade, sun, warn, cool, water, grow, healthy. | Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal- wind dispersal, animal dispersal, water dispersal, pollen, roots, stem, trunk, leaves, absorb, nutrients, reproduce, germination, stamen, style. | Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.<br><br>(living things and habitats) | Lifecycle, mammal, amphibian, germination, seed formation, insect, bird, pollination, life processes, plants, animals, reproduction, environment, dispersal, growth, living, eggs, and seeds.<br><br>(living things and habitats) | Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering.<br><br>ving things and habitats) |
| Key indicators | • Can plant seeds and care for growing plants.<br>• Understand the basic features of a simple plant lifecycle.<br>• Can name basic parts of a plant e.g. leaf, petal. | • Can name trees and other plants they see regularly.<br>• Can describe key features of the trees and plants e.g. shapes of leaves/colour of the flower/blossom.<br>• Can point out trees which lost their leaves and those who keep them all year. Can point to and name parts of a plant.<br>• Can use simple charts to sort. Can use photos to talk about how plants change. | • Can describe how plants that have grown from seeds and bulbs have developed over time.<br>• Can identify plants that grew well in different conditions.<br>• Can spot similarities and differences between bulbs and seeds.<br>• Can nurture seeds and bulbs into mature plants identifying the different requirements of different plants. | • Can explain the function of the parts of a flowering plant.<br>• Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal and germination.<br>• Can give different methods of pollination and seed dispersal, including examples.<br>• Can explain observations made during investigations.<br>• Can look at features of seeds to decide on method of dispersal.<br>• Can draw and label a diagram of their created flowering plant to show its parts and their role and method of pollination and seed dispersal. | See living things and habitats. | See living things and habitats. | See living things and habitats. |

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| **Animals including humans.**<br>  | **The Natural World**<br>Explore the natural world around them, making observations and drawing pictures of animals.<br><br>Begin to make sense of their own life-story and family's history.<br><br>Begin to understand the key features of the lifecycle of a plant and animal.<br><br>**People, culture and communities**<br>Describe their immediate environment using knowledge from observation, discussion, stories and non-fiction texts and maps.<br><br>**Personal, social and emotional development**<br>Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. | Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.<br>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.<br>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)<br>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated<br>  | Notice that animals, including humans, have offspring which grow into adults.<br>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)<br>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.<br>  | Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.<br><br>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.<br> | Describe the simple functions of the basic parts of the digestive system in humans.<br>Identify the different types of teeth in humans and their simple functions.<br>Construct and interpret a variety of food chains, identifying producers, predators and prey.<br>  | Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.<br><br>Describe the life processes of reproduction in some plants and animals.<br><br>(living things and habitats)<br><br>Describe the changes as humans develop from<br>  | Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.<br><br>Identify and name the main parts of the human circulatory system and describe the function of the heart, blood vessels and blood.<br><br>Describe the ways in which nutrients and water are transported within animals, including humans.<br>  |
| Key vocabulary | Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart, | Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, reptile, amphibian, mammal, omnivore, carnivore, herbivore, all senses. | Offspring, grow, adults, nutrition, reproduce, survival, water, food, air, exercise, hygiene, survival, exercise. | Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, skull, ribs, spine, muscles, joints. | Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, incisor, canine, herbivore, omnivore. | Puberty, vocabulary linked to describe a range of sexual characteristics. | Heart, pulse, rate, pumps, blood, blood vessel, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle. |
| Key indicators | Children can explore the natural world around them.<br>They can describe what the see, feel and hear when outside.<br>They can recognise environments which is different to the one they live in. | Can name a range of animals which includes animals from each of the vertebrate groups.<br>Can describe the key features of named animals.<br>Can label key features on a picture/diagram.<br>Can write descriptively about an animal. | Can sequence the stages of a baby. Observe these changes.<br>Can describe how animals change as they get older.<br>Develops understanding of how insects change (more than a butterfly) through lifecycle diagrams.<br>Can explain what humans and other animals need to survive- this could be through planning | Can name the nutrients found in food. Can state that to be healthy we need to eat the right types of food to give us the correct amount of these nutrients. Name some bones that make up the skeleton giving examples that support, help them move or provide protection. Can describe how muscles and | Can sequence the main parts of the digestive system. Can draw the main parts of the digestive system onto a human outline. Can describe what happens in each part of the digestive system. Can point to three different types of teeth in their mouth and talk about what each is used for. | Can explain the changes that takes place in boys and girls during puberty. Can explain how a baby changes physically as it grows and also what it is able to do. | Can draw a diagram of the circulatory system, label the parts and annotate it to show what the parts do. Can explain the positive and negative effects on diet, exercise, drugs and lifestyle on the body. |

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| | They can talk about simple similarities and differences between living things. They can make simple observations about animals and explain why some things occur.<br>They can explore basic lifecycles of animals. | Can write a 'What am I? riddle about an animal.<br>Can describe what a range of animals eat.<br>Can compare and classify animals. | a trip to the moon or desert Island.<br>Can describe how to keep clean and healthy. Has a good understanding of the food plate and understands 'a healthy balanced diet'. Can create a diet for an athlete. Can adopt a menu to substitute food from the eat well plate. Understands the effect of exercise on the body. | joints help them to move. Classify food groups (high/low nutrients), answer q's about nutrients in food, use data to look for patterns. Give similarities and differences between skeletons. | Demonstrate journey of food through body. Make a dental record, Can explain teeth in animals and if they are carnivores, herbivores or omnivores. | | |
| Living Things<br><br>Evolution and Inheritance | **People, culture and communities**<br>Explain some similarities and differences between life in this country and life in other countries, drawing on knowledge from stories, non-fiction texts and maps.<br><br>**Understanding the world**<br>Begin to understand the need to respect and care for the natural environment and all living things.<br><br>Explore the natural world around them.<br>  | • Name common plants and describe the basic structure of flowering plants, including trees.<br>(Plants)<br><br>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals<br>Identify and name a variety of common animals that are carnivores, herbivores and omnivores<br>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including<br>(Animals including Humans) | Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food<br>  | Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.<br>(Plants) | Recognise that living things can be grouped in a variety of ways.<br>Explore and use classification keys to help group, identify and name a variety of living things in their local environment.<br>Recognise that environments can change and that this can sometimes pose dangers to living things.<br>  | Describe the differences in the lifecycles of a mammal, an amphibian, an insect and a bird.<br><br>Describe the life processes of reproduction in some plants and anim…<br>  | 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.<br>…e reasons for classifying …nts and animals based on …s<br>  <br><br>Evolution and inheritance<br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.<br>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.<br>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of<br>  |
| Key Vocabulary | | See Animals including Humans<br><br>See Plants | Living, dead, never been alive, suited, suitable, basic need, food, food chain, shelter, move, feed, names of local habitats e.g. pond, woodland, names of micro habitats e.g. under logs, in bushes etc. | | Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate. | Lifecycle, mammal, amphibian, germination, seed formation, insect, bird, pollination, life processes, plants, animals, reproduction, environment, dispersal, growth, living, eggs, and seeds. Can dissect and label parts of flowering plant including male and female structures. Record finding as an annotated illustration of a | Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering.<br><br>Evolution<br>Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils. |

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| | | | | | | flowering plant. Research and explain the life cycle and reproduction of a plant using scientific language. | |
| Key indicators | Children will be able to explore the natural world and make observations.<br>Children will recognise animal habitats.<br><br>Children will understand how to look after animals and the environment including habitats.<br><br>Children will begin to explore where they live and compare to other places in the world e.g. weather, climate. | | Find a range of items which are dead, living. Can name plants/animals which live in different habitats and micro habitat. Can talk about the features of the animal/plant and how they are suited to the habitat. Can talk about what the animal eats. Can construct a food chain. | | Can name living things in a range of habitats, giving key features that helped identify them. Can give examples of how an environment may change both naturally and due to human impact. Can use classification keys to identify unknown plants and animals. | Can describe the lifecycles of mammals, amphibians and insects using diagrams. Can describe similarities and differences between them. | Can give examples of animals in the five vertebrate groups and some of the invertebrate groups. Can give key characteristics of the five vertebrate groups and some invertebrate groups. Can give examples of flowering and non-flowering plants. Can use classification keys to identify unknown plants and animals. Can create classification keys. Can give a number of characteristics that explain why an animal belongs to a particular group.<br><br>Evolution<br>Can explain the process of evolution. Can give examples of how plants and animals are suited to their environment. Can give examples of how an animal or plant has evolved over time e.g. penguin, peppered moth. Give examples of things that lived millions of years ago and the fossil evidence to support this. |
| **Materials**<br><br>  <br><br>**Rocks and Soils** | **The Natural World**<br>Understand some important processes and changes in the natural world around them, including changing states of matter.<br><br>**Speaking**<br>Offer explanations for why things happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems where appropriate.<br><br>**Understanding of the world**<br>Use all their senses in hands on exploration of natural materials. Explore collections of materials with similar | Distinguish between an object and the material from which it is made.<br>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.<br>Describe the simple physical properties of a variety of everyday materials.<br>Compare and group together a variety of everyday materials on the basis of their simple physical properties.<br>  | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.<br>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.<br>  | Notice that some forces need contact between two objects, but magnetic forces can act at a distance.<br><br>(Forces **and** magnetism)<br><br>Rocks and Soils<br>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.<br>Describe in simple terms how fossils are formed | STATES OF MATTER<br>Compare and group materials together, according to whether they are solids, liquids or gases (states of matter)<br>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 (States of matter)<br>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.<br>(states of matter)<br>  | Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.<br>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.<br>Use knowledge of solids, liquids gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.<br>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals wood and plastic.<br>Demonstrate that dissolving, mixing and | Recognise that living things have changed over time and that fossils provide information about living things that |

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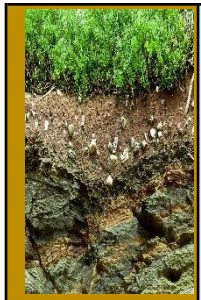
|  | and/or different properties.<br>Talk about what they see using a wide vocabulary.<br>Explore how things work.<br>Talk about the difference between materials and changes they notice. | | | when things that have lived are trapped within a rock.<br>Recognise that soils are made from rocks and | | changes of state are reversible changes.<br>Explain that some changes result in the formation of new materials and this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of | (Evolution and Inheritance) |
| Key Vocabulary | Wet, dry, shiny, dull, bendy, stiff, squashy, hard/soft, lumpy, wrinkly. Smooth, rough. | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through. | Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching. | Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb, water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil. | Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle | Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/not reversible, change, burning, rusting, new material. | |
| Key indicators | They can talk about simple similarities and differences between two materials and how materials change in terms of shape, size and texture.<br>They can describe materials using basic scientific words.<br>They can explore how things work.<br>They can group and classify materials using their properties. | Can label a picture/diagram of an object made from different materials.<br>Can describe the properties of materials.<br>Can sort materials using their properties. Can test evidence to answer a question. | Can name an object, say what material it is made from, identify properties and make a link between property and use. Whilst changing a shape of an object can describe the actions used.<br>Can use suitable vocabulary. Simple tests relevant to properties. Describe similarities and differences. | Can name some types of rock and give physical features of each. Can explain how a fossil is formed. Can explain that soils are made from rocks and also contain living/dead matter. Classify rocks in a range of ways using scientific vocabulary. Test properties of rocks. Show understanding of how fossils were formed, can identify plant/animal matter in soil, test water retention of soils. | Can create a concept map, including arrows linking the key vocabulary.<br>Can name properties of solids, liquids and gases.<br>Can give everyday examples of melting and freezing.<br>Can give everyday examples of evaporation and condensation.<br>Can describe the water cycle.<br>Can give reasons to justify why something is a solid liquid or gas.<br>Can give examples of things that melt/freeze and how their melting points vary<br>From their observations, can give the melting points of some materials.<br>Using their data, can explain what affects how quickly a solid melts.<br>Can measure temperatures using a thermometer.<br>Can explain why there is condensation on the inside the hot water cup but on the outside of the icy water cup<br>From their data, can explain how to speed up or slow down evaporation.<br>Can present their learning about the water cycle in a range of ways e.g. diagrams, explanation text, story of a water droplet. | Can explain everyday uses of material e.g. how bricks, wood, glass are used in buildings. Can explain what dissolving is, giving examples. Can name equipment used for filtering and sieving. Can use knowledge of liquids, gases and solids to suggest how materials can be recovered from solutions or mixtures by evaporation, filtering or sieving. Can describe simple reversible and non-reversible changes to materials, giving examples.<br>Can create chart/table grouping materials using properties. Suggest appropriate material for purpose. Can explain results from investigations | |

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| | | | | | | involving dissolving and non-reversible change. | |
| Seasonal Changes  | **The Natural World** Understand some important processes and changes in the natural world around them, including seasons. | Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies. | | Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. | | Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. (Forces) | Use the idea that light travels in straight lines to explain why shadows have the same shape as the object that casts them. (Light) |
| Earth and Space  | | | | Recognise that light from the sun can be dangerous and that there are ways to protect our eyes. Recognise that shadows are formed when the light source is blocked by a solid object. Find patterns in the way the size of the shadows change (Light) | | Earth and Space 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 Earth rotation to explain day and night due to the apparent movement of the | |
| Key vocabulary | Snow, wind, rain, sun, day, night, stormy, cloudy, hot, cold, foggy. | Weather (sunny, rainy, windy, snowy etc) Seasons (winter, summer, spring, autumn) sun, sunrise, sunset, Day length | | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous. (Light) | | Earth, sun, moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, Pluto (dwarf planet), spherical, solar system, rotates, star, orbit, planets, axis, night, day, season, galaxy. Meteorite. | Year 3 vocabulary- Plus Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous. (Light) |
| Key indicators | Can describe the weather outside and suggest what they might wear and what they might see. Can comment on the environment e.g. the leaves have fallen off the tree, there is a puddle. Children can understand the effect of changing seasons | Can name four seasons and identify when in the year they occur. Can observe and describe weather in different seasons. Can describe days being longer in summer and shorter in winter. Present data in tables charts and compare seasons. | | See Light | | Can show using diagrams the movement of the Earth and moon. Can explain the rotation of the Earth and how this causes night and day. Can explain evidence gathered about the position of shadows in terms of movement of the Earth. Can explain how a sundial works. Can explain why we have time zones. | See Light |

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| | on the natural world around them. | | | | | | |
| Light and sound  | **Understanding of the world**<br>Explore materials with different properties. Talk about what they see, using a wide vocabulary.<br><br>**Expressive arts and design**<br>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture form and function.<br><br>Explore colour and colour-mixing.<br><br>Play instruments with increasing control to express their feelings and ideas. | Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.<br>(Materials)<br><br>Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.<br>(Seasonal changes)<br><br>pets) Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense<br>(Animals incl humans) | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.<br>(materials)<br><br>• Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.<br>(Plants) | Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.<br>(Plants)<br><br>Recognise that they need light in order to see things and that dark is the absence of light.<br>Notice that light is reflected from surfaces.<br>Recognise that light from the sun can be dangerous and that there are ways to protect our eyes.<br>Recognise that shadows are formed when the light source is blocked by a solid object.<br>Find patterns in the way the size of the shadows change | Recognise that environments can change and that this can sometimes pose dangers to living things.<br>(living things and habitats)<br><br>SOUND<br>To identify how sounds are made, associating some of them with something vibrating.<br>Recognise that vibrations from sounds travel through a medium to the ear.<br>Find patterns between pitch of a sound and features of the object that produced it.<br>Find patterns between the volume of a sound and the strength of the vibrations that produced it.<br>Recognise that sound gets fainter as the distance from the sound source increases. | Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets.<br>(materials)<br><br>Use Earth rotation to explain day and night due to the apparent movement of the sun across the sky.<br>(Earth and Space) | cognise that light travels straight lines.<br>e the idea that light vels in straight lines to plain that objects are en because they give out reflect light into the eye.<br>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes.<br>e the idea that light vels in straight lines to plain why shadows have e same shape as the object that casts them. |
| Key vocabulary | Smell, sound, sight, see, look, | See Seasonal Changes<br><br>See Animals Including Humans | | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous. | Sound, source, vibrate, vibration, travel, pitch, volume, faint, loud, insulation. | Earth, sun, moon, Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune, Pluto (dwarf planet), spherical, solar system, rotates, star, orbit, planets, axis, night, day, season, galaxy. Meteorite. | r 3 vocabulary- Plus Light, t source, dark, absence of t, transparent, translucent, aque, shiny, matt, surface, dow, reflect, mirror, light, dangerous. |
| Key indicators | Children will be able to identify and name different colours. They can mix colours and explain the changes. They can experiment with sound and making different noises with musical instruments and | See Seasonal Changes<br><br>See Animals Including Humans | | Can describe how we see objects in lights and can describe dark as the absence of light. Know it is dangerous to look at the sun. Define transparent, translucent and opaque. Can describe how shadows are formed. Predict what materials will be more/less visible. . | Can describe different types of objects producing different sounds and that the sound is produced by vibration in the object. Can describe sounds travelling through different mediums such as air, water, metal. Can find patterns between pitch and volume and the features of the object producing it. Can recognise that sounds get fainter as the | (See Earth and Space) | Can describe with diagrams how light travels in straight lines, either from sources or reflected from other objects into our eyes. Can describe with diagrams how light travels in straight lines past translucent or opaque objects to form a shadow of the same shape. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | express using different terms such as loud, quiet, beat, vibrate. | | | | distance from the sound source increases.<br>Can explain what happens when you strike a drum or pluck a string- use diagrams to show.<br>Demonstrates how to increase/decrease pitch and volume. | | |
| Forces<br>  | **Understanding the World.**<br>Explore and talk about different forces they can feel.<br>Can talk about the differences between materials and changes they notice. | Describe the simple physical properties of a variety of everyday materials.<br>Compare and group together a variety of everyday materials on the basis of their simple physical properties.<br>(Materials) | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.<br>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.<br>(Materials)<br>Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching. | Compare how things move on different surfaces<br>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.<br>Observe how magnets attract or repel each other and attract some materials and not others.<br>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.<br>Describe magnets as having two poles.<br>Predict whether two magnets will attract or repel each other, depending on | | Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.<br>Identify the effects of air resistance, water resistance and friction that act between moving surfaces.<br>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to<br>To describe the movements of the Earth, and other planets, relative to the Sun in the solar system (Earth and Space) | |
| Key Vocabulary | Push, pull, twist, stretch, turn, open, lift, squeeze, pinch, flick, tap. | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through.<br>(Materials) | (Materials)<br>(Materials) | Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel. Magnetic material, metal, iron, steel, poles, north pole, south pole. | | Force, Gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears. | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Key indicators | Children will be able to play with a range of toys of varying sizes made of different materials and fit them together in different ways such as twisting, pushing, slotting or magnetism. Can manipulate playdough in different ways. | (See Materials) | (See Materials) | Give examples of forces in everyday life. Give examples of objects moving differently on different surfaces. Name a range of magnets and show how the poles attract and repel. Can draw diagrams using arrows to show the attraction and repulsion between the poles of magnets. Can use results to describe how objects move on different surfaces. Can use results to make predictions. Can use some classification to know some metals are not magnetic. Use test data to rank magnets. | | Can demonstrate the effect of gravity acting on an unsupported object. Can give examples of friction, water resistance and air resistance. Can give examples of when it is beneficial to have high or low friction, water resistance, and air resistance. Can demonstrate how pulleys, levers and gears work. | |
| Electricity | Shows skills in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movement or new images.  | Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Materials) | Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. (Materials) | | 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.  | Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets. (Materials) | Associate the brightness of a mp or the volume of a buzzer th the number and voltage of ls used in the circuit. mpare and give reasons for riations in how components nction, including the ghtness of bulbs, the udness of buzzers and the n/off potion of switches. Use recognised symbols when representing a simple circuit in a diagram.  |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see through, not see through.<br>(Materials) | Names of materials: wood, plastic, glass, metal, water, rock, brick, paper, fabric, card, rubber, suitable/unsuitable, use/useful, hard/soft, stretchy/stiff. Rigid/flexible, waterproof/absorbent, strong/weak, rough/smooth, transparent/opaque, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.<br>(Materials) | | Can name the components in a circuit. Can make an electric circuit. Can control a circuit using a switch. Can name some metals that are conductors. Can name materials that are insulators.<br>Can communicate structures of circuits using drawings. Can incorporate a switch. Can add a circuit with a switch to a DT project and demonstrate how it works. Can describe how a switch works. | | Explain how a circuit operates to achieve particular operations, such as control the light for a torch with different brightnesses or make a motor go faster or slower<br>Make circuits to solve particular problems such as a quiet and a loud burglar alarm<br>Carry out fair tests exploring changes in circuits<br>Make circuits that can be controlled as part of a D&T project |
| | | | | | Electrical, appliance, mains, plug, circuit, component, cell, battery, positive, negative, connect/connectors, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol. | | Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage<br>NB Children do not need to understand what voltage is but will use volts and voltage to describe different batteries. The words cells and batteries are now used interchangeably |

# REVISITS

*'If nothing has altered in long-term memory, nothing has been learned'* - (Sweller et al, 2011)

Our Science curriculum is designed to support children's learning and retention over time; its progressive and cyclical nature ensures that children revisit learning, make connections and build knowledge over time, retaining children's knowledge in their long-term memories and progressively broadening their understanding of Science. We support this in lessons through a number of ways:

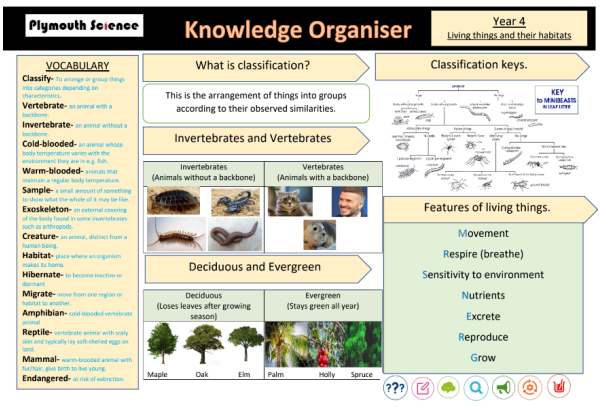
## Previous Learning Slides


At the beginning of the lesson, teachers will share a 'Previous Learning' slide with pupils. This provides teachers with the opportunity to discuss prior knowledge and previously taught skills from past lessons. The aim is that children are supported in making connections between what they already know and their new learning. Previous learning links could be drawn from a previous lesson, previous unit of work or learning from a previous year group or key stage. Children are prompted to recall previous learning with a question and an associated image.

This short quiz encourages pupils to remember knowledge content covered in previous learning. The quiz is low-stakes: pupils work on whiteboards, discuss with their peers and have access to exercise books and working walls. It is not graded or recorded. The aim is to retain knowledge over time.

## Knowledge Organisers

Each Science topic has an accompanying knowledge organiser which highlights particular vocabulary, knowledge, images and diagrams which will be key to the topic. Pupils can refer back to this throughout the topic, helping them to recall prior knowledge.




# INCLUSION

**Learning Intentions**

Each lesson will have a clear Learning Intention (LI) for both knowledge and working scientifically. This ensures that both knowledge and working scientifically receive the coverage they require, but also that broad objectives can be made more specific, and develop in understanding and depth over time. Learning Intentions are discussed with children at the beginning of each lesson, with children in KS2 ticking the working scientific skill and enquiry type that they will be working on in that lesson. This supports children to understand the ways in which they are 'being scientists' that day.

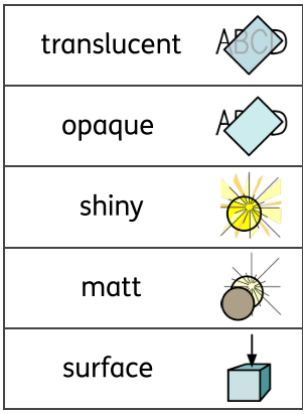
| wb. 8th January 2024<br>**LO: To match, sort and group animals and their offspring.** | grades | | I | GW | AS | VF |
|---|---|---|---|---|---|---|
| **Working Scientifically Objectives: To make observations about similarities and differences between animals and their offspring.** | | | | | | |
| Working Scientifically Skill: | | | | | | |
| | | | X | | | |
| Enquiry Type: | | | | | | |
| | | | X | | | |

**SEN Provision**

When planning for children with SEND, teachers consider ways of minimising or reducing barriers so that children can fully take part and learn. This is done with an awareness and understanding of individual children's needs and preferred methods of working. This may mean meaning modifications or adjustments to ensure all children are included, or planning a 'parallel' activity for pupils with SEN so that they can work towards the same lesson objective as their peers, e.g. using audio recorders instead of written notes during investigations, accessing simulations or simple diagrams during the explanation of concepts, and making difficult-to-see processes visible through the use of a camera. For some children it may be necessary to pre-teach vocabulary or provide cards with symbols or images to support understanding, and classroom displays are used to support this. Teachers consider the questions that will be asked of groups and individuals, and the ways they will check pupils' understanding. Working scientifically skills are revisited and built on through the key stages; planning considers the objectives and outcomes more suited to the stage of learning of individual pupils, e.g. the support needed for a child to use equipment to take measurements.

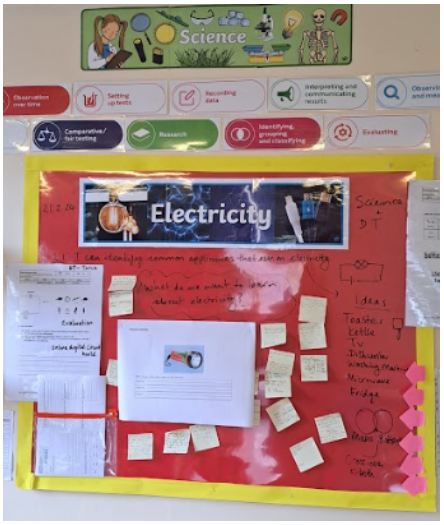
**Vocabulary**

In order for pupils to be confident Scientists, we expect them to accurately and confidently use scientific vocabulary. The vocabulary that they need to know in each topic is mapped out on the progression of learning, ensuring children build on their vocabulary each year or each time they revisit a topic, and is detailed on the first page of each medium term plan. This aligns with the vocabulary provided by knowledge organisers. In addition, this vocabulary is displayed on working walls with appropriate accompanying visuals or symbols, to support pupils' understanding.



The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. They must be assisted in making their thinking clear, both to themselves and others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

**Environment**




All classrooms feature a Science working wall; regularly updated to reflect current learning, the working wall serves as a memory aid to children during lessons, displaying relevant prompts that will support pupils to recall and remember more over time. Science working walls include the symbols representing the focus enquiry type and 'working scientifically' skill for that week, supporting children's knowledge and understanding of these in context with their lessons and lessons where these may previously have been referenced. Key vocabulary is displayed, with appropriate visuals or symbols, and added to over the course of the topic gradually to support children's understanding of terms. Depending on the topic and learning journey, working walls may also include diagrams, images, children's work, children's post-it note questions or concept maps.

**Digital Strategy**

The Park Federation is building a one-to-one digital learning strategy in all of their schools with the vision of providing each of its pupils with a chromebook as a digital learning tool to amplify and enhance learning. Technology will always be used as a tool to enhance the already good teaching and learning practices that are in place, it will be used as a vehicle to bring access and equity to all learners in our schools. At West Drayton Academy, all pupils in Year 4, 5 and 6 have access to their own chromebook for use in their lessons, including Science. This can be seen through prior learning quizzes, jamboard questions and completing  lessons on Google classroom, or other websites and applications. Every lesson can look different. Online safety lessons are explicitly taught and interwoven into our day.

# PERSONAL DEVELOPMENT

At West Drayton Academy we believe it is important that children see and experience Science as part of their everyday lives, and experience Science beyond that offered by the National Curriculum. At WDA, we want to develop responsible, respectful and active children who are prepared for modern Britain. Science is a central part of many aspects of the personal development curriculum. Through the strand of 'Staying Safe', children learn about fire and water safety, applying their understanding of animals and materials, 'Building Futures' encompasses how we can be a good citizen through scientific knowledge and understanding of the world, while through 'Health and Wellbeing' children consider the implications of exercise on the human body and prepare healthy meals. Science is key to the Personal Development strand 'Caring for the Environment', in which children learn about recycling, biodiversity, air pollution, renewable energy, deforestation, and climate change; this encompasses a range of learning across the curriculum, showing children the applications of Science knowledge and understanding in the real world.

# SMSC

## Spiritual development

Spiritual education in Science involves the search for meaning and purpose in natural and physical phenomena. It is the wonder about what is special about life, an awe at the scale of living things from the smallest microorganism to the largest tree and the interdependence of all living things and materials of the Earth. It concerns the emotional drive to know more and to wonder about the world and aesthetically appreciate its wonders including for example the enormity of space and the beauty of natural objects or phenomenon, plants, animals, crystals, rainbows, the Earth from space etc. Beyond the curriculum, the WDA Science Club for both KS1 and KS2 provides opportunities to further explore the 'awe and wonder' of Science through a range of experiments and investigations.

## Moral development

In Science, Moral education encourages students to become increasingly curious, to develop open mindedness to the suggestions of others and to make judgements on evidence not prejudice. Students realise that moral dilemmas are often involved in scientific developments. When considering the environment the use of further natural resources and its effect on future generations is an important moral consideration, e.g. through **Votes for Schools** debates. Each week, we participate in a class debate and vote around a particular topic. Some of these topics link particularly with Science, such as:

- Do you think alien life exists?
- Are we safe in the sun?
- Do you care about our rivers and seas being clean?
- Will using AI make our lives better?
- Will science solve the worlds' problems?

The Votes for Schools themes allow pupils to apply their learning to current, real-world issues, as well as connecting to learning in other subjects, such as Geography and History. This allows teachers to highlight the importance and relevance of the subject for pupils, and they can consider their classroom learning in light of these discussions.

## Social development

Social development is supported in Science by encouraging children to work together and cooperatively in pairs and groups for practical work. In Science lessons, children are encouraged to develop team working skills, supporting their peers through enquiries and taking responsibility for their own and others' safety. Science also has an effect on the quality of our lives and children are encouraged to consider the benefits and drawbacks of scientific and technological development.

## Cultural development

Teaching Science supports Cultural development by encouraging children to learn about, discuss, and appreciate the development of scientific knowledge throughout history and how it has contributed and continues to contribute to changes in our society. Through the study of a range of scientists, historical and contemporary, they understand that science is a discipline undertaken by a wide range of men and women in many different cultures. This is supported by the use of **GRADES** when planning. At West Drayton Academy, we refer to the differences of gender, relationships, age, disability, ethnicity and sexual orientation as GRADES. We want our children to recognise, respect and welcome everyone's differences, be inspired, tolerant and learn from the past. We celebrate these differences throughout the curriculum, including in Science. This is done through the study of a range of Scientists connected with topics, e.g. Charlie Dimmock and Mary Anning in Year 3. Teachers also plan with reference to resources such as the Primary Science Teaching Trust's 'A Scientist Just Like Me', Explorify's 'Celebrating Scientists' or the British Science Association's 'Smashing Stereotypes', introducing children to scientists in a range of fields who belong to a diverse range of groups based on gender, ethnicity, sexuality and disability.

## Cultural Capital

Cultural Capital is the essential knowledge that children should have to prepare them for success in the future. This includes language, beliefs, traditions and interests/hobbies. Cultural Capital is the range of knowledge, behaviours, and skills that children can draw upon to demonstrate their cultural awareness. It will allow them to be successful in society. **Science capital** is a concept that can help us to understand why some young people participate in post-16 science and others do not. In particular, it helps shed light on why particular social groups remain underrepresented and why many young people do not see science careers as being 'for me'. The concept of science capital can be imagined like a 'holdall', or bag, containing all the science-related knowledge, attitudes, experiences and resources that you acquire through life. It includes what science you know, how you think about science (your attitudes and dispositions), who you know (e.g. if your parents are very interested in science) and what sort of everyday engagement you have with science. The Science curriculum at West Drayton supports children's Science capital by:

- Developing their science literacy through frequent and regular opportunities to revisit and revise knowledge, developing confidence in their feeling that they know about science
- Making connections to science in their everyday life, e.g. exploring rocks in the school environment, investigating growing of vegetables and visiting local farms, providing context for investigations to make them relevant and 'useful'
- Introducing children to a range of scientists, working in a number of different fields, doing many different jobs through the use of our GRADES programme

Children's Science Capital is also developed by giving children opportunities to take part in informal science learning such as museums, clubs and fairs. At WDA we provide children with these opportunities in the following ways:

**100 Club**

As part of the wider curriculum offered at WDA, the '100 Club' provides 100 opportunities to engage in a range of experiences, develop life skills and further grow knowledge.

*Some of the activities linked to the Science curriculum include:*

- Be a recycling hero
- Grow something from seed
- Cook a healthy meal
- Complete a First Aid course
- Touch a snake
- Talk to an astronaut
- Float in a boat

*Classes also take part in trips and experiences throughout their time at WDA, including:*

- Visit to a farm in Reception
- Visit to Whipsnade Zoo in Year 1
- Fruit picking experience in Year 3
- Visit to the Planetarium in Year 5

**Science Week**

At West Drayton Academy, we celebrate Science Week in the Summer Term. This 5-day celebration of science, technology, engineering and maths features engaging events and activities across the curriculum. Science week provides a platform for children to engage in activities, investigations and events beyond and outside of the national curriculum, developing their Science Capital as they build on their knowledge of science in the wider world. Each year group participates in a sequence of activities developed by Plymouth Science focussed on the British Science Week theme, e.g. 'Time', 'Connections' or 'Growth'. In addition, they explore the theme through their Reading and Writing lessons, by exploring a range of Scientists in Citizenship and taking part in a poster competition related to the year's theme. Children may also have the opportunity to engage in talks, workshops, or experiences delivered by visiting scientists.

# British Values

**Democracy**

We all have a role in influencing decisions, and everyone has a right to have their voices heard. We should be aware of our rights and responsibilities.

***What does this look like in science?***

- Students work together practically in groups which encourages them to share views and opinions and take instructions from others.
- There are opportunities to debate issues where students can share their opinions and listen to the views of others. For example, the generation of electricity, the placement of quarries, the use of drugs, genetic modification, selective breeding and climate change.

**The Rule of Law**

Laws protect everyone and no-one is above the law. We should understand the need for rules to make a happy, safe and secure environment and know the consequences when rules are not followed.

***What does this look like in science?***

- Students follow laboratory rules for the safety of all.
- Students learn about the need for speed limits and seat belts.
- There are opportunities to discuss laws relating to science, such as the use of IVF, stem cells, genetic modification and DNA databases, maintaining biodiversity, use of energy sources, fishing and farming.

**Individual Liberty**

We have a freedom of choice and a right to respectfully express our views and beliefs. We can act as we choose within the law. The rights of ourselves and the others around us are protected.

***What does this look like in science?***

- There are opportunities for students to work independently and make choices in a safe environment when carrying out investigations.
- There are opportunities to debate issues where students can share their opinions and listen to the views of others. For example, the generation of electricity, the placement of quarries, the use of drugs, genetic modification, selective breeding and climate change.

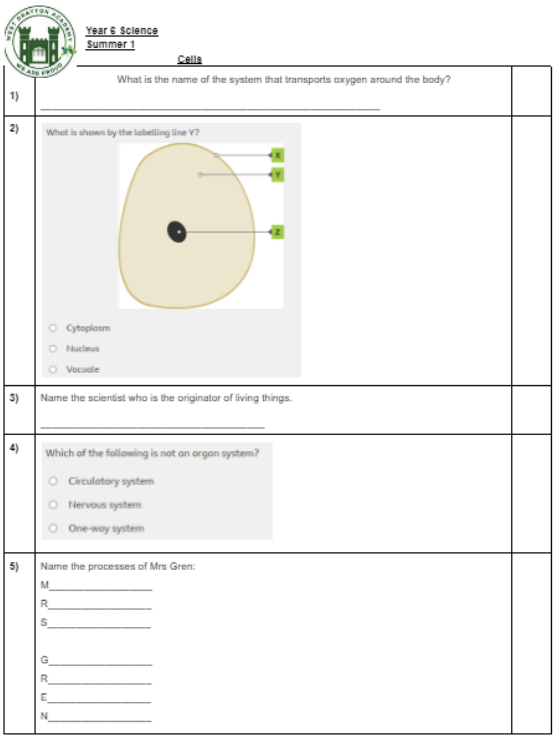
**Mutual Respect and Tolerance**

There is equality and fairness for all, regardless of background or religious beliefs. We understand that we do not all share the same beliefs and values. We respect the values, ideas and beliefs of others and do not impose our own onto them.

***What does this look like in science?***

- Students work together practically in groups which encourages teamwork and respect for others.
- There are opportunities to learn about scientific discoveries by a diverse range of people from our culture and other cultures.
- Students learn about the continual evolution of scientific ideas which occurs through the acceptance that different people have different ideas about a concept.
- There are opportunities to consider conflict between religious beliefs and scientific understanding with respect and acceptance of people's values.

# IMPACT



Year 6 Science
Summer 1

Cells

1) What is the name of the system that transports oxygen around the body?

2) What is shown by the labelling line Y?

Cytoplasm
Nucleus
Vacuole

3) Name the scientist who is the originator of living things.

4) Which of the following is not an organ system?

Circulatory system
Nervous system
One-way system

5) Name the processes of Mrs Gren:

M_____
R_____
S_____

G_____
R_____
E_____
N_____

## Assessment

Assessment of Science is ongoing, with teachers assessing knowledge and skills throughout topics, using previous learning slides and through a range of enquiry types. Pupils complete a knowledge quiz at the end of each topic. This helps teachers to assess who has gained the key knowledge detailed on the MTP. It is important that pupils have acquired and remembered this knowledge, to aid their retention of knowledge over time as well as to help them build on learning in future topics and year groups. Questions will take different formats, including multiple choice or open-ended questions. Quizzes are designed by teachers using key knowledge from the Plymouth Schemes.

The skills tracker is used by teachers to assess children's acquisition of Working Scientifically skills relevant to their year group, while examples from books are also used as evidence to support teacher judgements.

| SKILLS | | | | | | | | | | | | | | | | | | KNOWLEDGE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AA: General / asking questions | AB: General / asking questions | BA: Observing changes over time | BB: Observing changes over time | BC: Observing changes over time | CA: Comparative and fair tests | CB: Comparative and fair tests | CC: Comparative and fair tests | CD: Comparative and fair tests | DA: Identifying and classifying | EA: Looking for naturally occurring | EB: Looking for naturally occurring | EC: Looking for naturally occurring | FA: Recording and reporting findings | FB: Recording and reporting findings | FC: Recording and reporting findings | GA: Researching and using secondar | Skills | | AUTUMN TERM 1 TOPIC: Habitats | AUTUMN TERM 2 TOPIC: Materials | SPRING TERM 1 TOPIC: Space | SPRING TERM 2 TOPIC: | SUMMER TERM 1 TOPIC: | SUMMER TERM 2 TOPIC: Plants |
| Be able to ask a question. | Understand that some questions can be answered in different ways e.g. testing, observing, research | Recognise that some observable features may change over time, e.g. the size of a plant. | Recognise that some observable features may change over time, and suggest reasons why they have occurred. | Use a range of equipment provided, e.g. hand lenses, to make more accurate observations. | Be able to compare the features of two objects, identify and explain what has changed. | Identify the two variables in an investigation. | Start to recognise when a test is not fair and suggest improvements. | Performing simple tests. | Talk about what they found out or what they think might happen | To begin to notice patterns and relationships from their observations | Use evidence to suggest answers to their questions and begin to think about predictions | Begin to use simple scientific language to talk about what they found out | Continue to use simple scientific language. | Help to make decisions on how to record and analyse data in a range of ways. | Begin to identify relevant evidence used to draw conclusions. | Use information from given secondary sources to help answer a question. | % of Skills Achieved | No. of Skills Achieved | Quiz Score (10) | Quiz Score (10) | Quiz Score (10) | Quiz Score (10) | Quiz Score (10) | Quiz Score (10) |
| 55 | 19 | 0 | 0 | 0 | 38 | 0 | 12 | 57 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | | | |
| 61% | 21% | 0% | 0% | 0% | 42% | 0% | 13% | 63% | 30% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | 17 | | | | | | |
| 1 | 1 | | | | 1 | | 1 | 1 | 1 | | | | | | | | 35% | 6 | 8 | A | | | | |
| 1 | 0 | | | | 0 | | 0 | 1 | 1 | | | | | | | | 18% | 3 | - | 3 | | | | |
| 1 | 1 | | | | 1 | | 1 | 1 | 1 | | | | | | | | 35% | 6 | 7 | 9 | | | | |
| 1 | 0 | | | | 0 | | 0 | 1 | 1 | | | | | | | | 18% | 3 | 5 | 4 | | | | |
| 1 | 1 | | | | 1 | | 1 | 1 | 1 | | | | | | | | 35% | 6 | 6 | 9 | | | | |
| 1 | 1 | | | | 1 | | 0 | 1 | 1 | | | | | | | | 29% | 5 | 3 | 5 | | | | |
| 1 | 1 | | | | 1 | | 0 | 1 | 1 | | | | | | | | 29% | 5 | 5 | 9 | | | | |
| 1 | 1 | | | | 1 | | 0 | 1 | 1 | | | | | | | | 29% | 5 | 7 | 9 | | | | |
| 1 | 1 | | | | 1 | | 0 | 1 | 1 | | | | | | | | 29% | 5 | 1 | 5 | | | | |
| 1 | 1 | | | | 1 | | 1 | 1 | 1 | | | | | | | | 35% | 6 | 8 | 9 | | | | |

## The Role of the Subject Leader

The Science Subject and Senior Leaders monitor the quality of teaching and learning in Science across the school, including planning reviews, pupil voice and book sampling exercises to measure impact and further improve outcomes for pupils across the school. These are conducted termly and the findings of these reviews inform planning for future CPD, support and further monitoring.