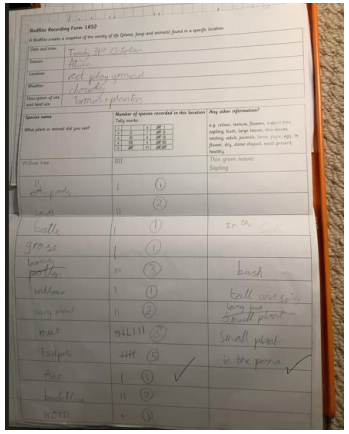
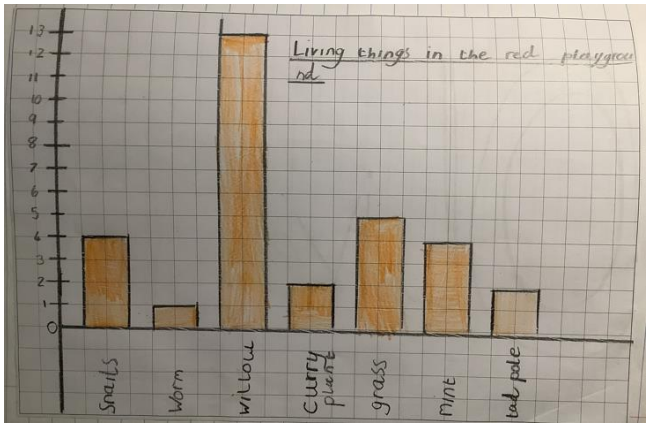
Hope Kindness Forgiveness Aspiration Love Courage Trust Respect Friendship

Drake Primary School and Little Pirates

Year 3 Science Curriculum Overview 2024-2025

<table>
<tr><th>Term</th><th colspan="2">Autumn
(14 weeks)</th><th colspan="2">Spring
(12 weeks)</th><th>Summer
(12 weeks)</th></tr>
<tr><td>Longitudinal Study: BioBlitz</td><td colspan="5">A BioBlitz creates a snapshot of the variety of life (plants, fungi & animals) found in a specific location.
Count the plants, animals and fungi that are in the Red Playground. Draw a bar chart of the results. Repeat every term.
Drake > CURRICULUM DEV > Science > 2024/25> BioBlitz
 
  </td></tr>
<tr><td>Theme</td><td colspan="2">Origins
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 </td><td>Conflict
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<tr><td>Science focus</td><td>Chemistry: Rocks</td><td>Physics: Forces and movement</td><td>Physics: Light</td><td>Biology: Animals, including humans</td><td>Biology: Plants</td></tr>
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Science National Curriculum	**Chemistry: Rocks** ● Compare and group together different kinds of rocks (including those in the local. environment) on the basis of their appearance and simple physical properties. ● Describe in simple terms how fossils are formed when things that have lived are trapped within rock. ● Recognise that soils are made from rocks and organic matter. **Physics: Forces and magnets** ● Compare how things move on different surfaces. ● Notice that some forces need contact between two objects, but magnetic forces can act at a distance. ● Observe how magnets attract or repel each other and attract some materials and not others ● Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. ● Describe magnets as having two poles. ● Predict whether two magnets will attract or repel each other, depending on which poles are facing.	**Physics: Light** ● Recognise that they need light in order to see things and that dark is the absence of light. ● Notice that light is reflected from surfaces. ● Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. ● Recognise that shadows are formed when the light from a light source is blocked by an opaque object. ● Find patterns in the way that the size of shadows change. **Biology: Animals, including humans** ● 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. ● Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**Biology: Plants** ● Identify and describe the functions of different part of flowering plants: roots, stem/trunk, leaves and flowers. ● Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. ● Investigate the way in which water is transported within plants. ● Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. ● Know that plants make their own food.
Key Concepts	**Rocks**	**Light**	**Plants**

	Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone, slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles, boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter). The type of rock, size of rock pieces and the amount of organic matter affect the property of the soil. Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals died, they fell to the seabed. They became covered and squashed by other material. Over time the dissolving animal and plant matter is replaced by minerals from the water. **Forces and magnets** A force is a push or a pull. When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes. A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together	We see objects because our eyes can sense light. Dark is the absence of light. We cannot see anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects are easier to see when there is less light if they are reflective. The light from the sun can damage our eyes and therefore we should not look directly at the sun and can protect our eyes by wearing sunglasses or sunhats in bright light. Shadows are formed on a surface when an opaque or translucent object is between a light source and the surface and blocks some of the light. The size of the shadow depends on the position of the source, object and surface. **Animals, including humans** Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need. Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals, fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a range of nutrients. Humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.	Many plants, but not all, have roots, stems/trunks, leaves and flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant's food. Some plants produce flowers which enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination). This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.

	they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.		
Common misconceptions	**Rocks** Some children may think: • rocks are all hard in nature • rock-like, man-made substances such as concrete or brick are rocks • materials which have been polished or shaped for use, such as a granite worktop, are not rocks as they are no longer 'natural' • certain found artefacts, like old bits of pottery or coins, are fossils • a fossil is an actual piece of the extinct animal or plant • soil and compost are the same thing. **Forces and magnets** Some children may think: • the bigger the magnet the stronger it is • all metals are magnetic.	**Light** Some children may think: • we can still see even where there is an absence of any light • our eyes 'get used to' the dark • the moon and reflective surfaces are light sources • a transparent object is a light source • shadows contain details of the object, such as facial features on their own shadow • shadows result from objects giving off darkness. **Animals, including humans** Some children may think: • certain whole food groups like fats are 'bad' for you • certain specific foods, like cheese are also 'bad' for you • diet and fruit drinks are 'good' for you • snakes are similar to worms, so they must also be invertebrates • invertebrates have no form of skeleton.	**Plants** Some children may think: • plants eat food • food comes from the soil via the roots • flowers are merely decorative rather than a vital part of the life cycle in reproduction • plants only need sunlight to keep them warm • roots suck in water which is then sucked up the stem.
Possible activities	**Rocks** • Observe rocks closely.	**Light** • Explore how different objects are more or less visible in different levels of lighting.	**Plants** • Observe what happens to plants over time when the leaves or roots are removed.

	• Classify rocks in a range of ways, based on their appearance. • Devise a test to investigate the hardness of a range of rocks. • Devise a test to investigate how much water different rocks absorb. • Observe how rocks change over time e.g. gravestones or old building. • Research using secondary sources how fossils are formed. • Observe soils closely. • Classify soils in a range of ways based on their appearance. • Devise a test to investigate the water retention of soils. • Observe how soil can be separated through sedimentation. • Research the work of Mary Anning. **Forces and magnets** • Carry out investigations to explore how objects move on different surfaces e.g. spinning tops/coins, rolling balls/cars, clockwork toys, soles of shoes etc. • Explore what materials are attracted to a magnet. • Classify materials according to whether they are magnetic. • Explore the way that magnets behave in relation to each other. • Use a marked magnet to find the unmarked poles on other types of magnets. • Explore how magnets work at a distance e.g. through the table, in water, jumping paper clips up off the table.	• Explore how objects with different surfaces, e.g. shiny vs matt, are more or less visible. • Explore how shadows vary as the distance between a light source and an object or surface is changed. • Explore shadows which are connected to and disconnected from the object e.g. shadows of clouds and children in the playground. • Choose suitable materials to make shadow puppets. • Create artwork using shadows. **Animals, including humans** • Classify food in a range of ways. • Use food labels to explore the nutritional content of a range of food items. • Use secondary sources to find out the types of food that contain the different nutrients. • Use food labels to answer enquiry questions e.g. How much fat do different types of pizza contain? How much sugar is in soft drinks? • Plan a daily diet to contain a good balance of nutrients. • Explore the nutrients contained in fast food. • Use secondary sources to research the parts and functions of the skeleton. • Investigate patterns asking questions such as: ▪ Can people with longer legs run faster? ▪ Can people with bigger hands catch a ball better? • Compare, contrast and classify skeletons of different animals.	• Observe the effect of putting cut white carnations or celery in coloured water. • Investigate what happens to plants when they are put in different conditions e.g. in darkness, in the cold, deprived of air, different types of soil, different fertilisers, varying amount of space. • Spot flowers, seeds, berries and fruits outside throughout the year. • Observe flowers carefully to identify the pollen. • Observe flowers being visited by pollinators e.g. bees and butterflies in the summer. • Observe seeds being blown from the trees e.g. sycamore seeds. • Research different types of seed dispersal. • Classify seeds in a range of ways, including by how they are dispersed. • Create a new species of flowering plant.

	• Devise an investigation to test the strength of magnets.		
Scientists https://pstt.org.uk/unique-resources/a-scientist-just-like-me/	**Rocks** Mary Anning (English palaeontologist) **Forces and movement** Rafsan Chowdhury (Bangladeshi Mechanical Engineer) 	**Light** Robert Pal (Hungarian/British Microscopist) **Animals, including humans** Marie Curie- Radiation (Polish and French chemist) 	**Plants** Wangari Maathai- countered deforestation, link to seed dispersal (Kenyan environmental activist)
Arts enrichment opportunities	**Rocks** Drawing cross section of the soil Sketching fossils **Forces and movement** Iron fillings - draw magnetic field	**Light** Shadow art - every hour check the shadow- chalk on the playground **Animals, including humans** Anatomical drawings- half skin and half muscles / half skeleton, half skin	**Plants** Draw microscopic image of xylem cell Draw a scientific drawing of a flower with the parts
Books you could use **https://www.stem.org.uk/teaching-science-through-stories**	**Pebble In My Pocket (Meredith Hooper)**- tells the dynamic story of rock formation; showing the reader the processes that the pebble goes through from its beginnings in a fiery volcano 480 million years ago. **The Iron Man (Ted Hughes)** - is the perfect story to explain how magnets	**The Firework Maker's Daughter (Philip Pullman)**- is a good starting point for teaching about light.	**The story of Frog Belly Rat Bone** (**Timothy Basil Ering)**- provides a good setting for investigating plants and their benefits to our environment.

	attract or repel each other and attract some material and not others.		
Trips / Visitors / Experiences	Norwich Castle- Stone Age Rock hunting in the school grounds- what types of rocks can we find? Playground to explore forces	Trip to the river- Little Ouse and river Thet	Frederick's wood to look at plants Rainwater planter project- red playground
LKS2 Working Scientifically National Curriculum	•Asking relevant questions using different types of scientific enquiries to answer them. •Setting up simple practical enquiries, comparative and fair tests. •Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. •Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. •Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables •Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. •Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. •Identifying differences, similarities or changes related to simple scientific ideas and processes. •Using straightforward scientific evidence to answer questions or to support their findings.		
Enquiry suggestions	**Rocks** **Comparative / fair testing** Which soil absorbs the most water? How does adding different amounts of sand to soil affect how quickly water drains through it? **Research** Who was Mary Anning and what did she discover? **Observation over time** What happens when water keeps dripping on a sandcastle? **Pattern Seeking** Is there a pattern in where we find volcanos on planet Earth? **Identifying, grouping and classifying**	**Light** **Comparative / fair testing** Which pair of sunglasses / creams will be best at protecting our eyes? How does the number of layers of transparent plastic affect how much light can pass through? How does the distance between the shadow puppet and the screen affect the size of the shadow? **Research** How does the Sun make light? **Observation over time** When is our classroom darkest? Is the Sun the same brightness all day? **Pattern Seeking**	**Plants** **Comparative / fair testing** Which conditions help seeds germinate faster? How does the length of the carnation stem affect how long it takes for the food colouring to dye the petals? **Research** What are all the different ways that seeds disperse? **Observation over time** What happens to celery when it is left in a glass of coloured water? How do flowers in a vase change over time? **Pattern Seeking**

	Can you use the identification key to find out the name of each of the rocks in your collection? **Scientific Discovery** How did Mary Anning's work help us to understand prehistoric life? **Forces and magnets** **Comparative / fair testing** Which magnet is strongest? Which surface is best to stop you slipping? How does the mass of an object affect how much force is needed to make it move? **Research** How does a compass work? **Observation over time** If we magnetise a pin / paper clip, how long does it stay magnetised for? **Pattern Seeking** Does the size and shape of a magnet affect how strong it is? **Identifying, grouping and classifying** Which materials are magnetic? **Scientific Discovery** How have our ideas about magnets changed over time? What do we use magnets for in 2023?	Are you more likely to have bad eye sight and to wear glasses if you are older? **Identifying, grouping and classifying** How would you organise these light sources into natural and artificial sources? **Animals, including humans** **Comparative / fair testing** How does the skull circumference of a girl compare with that of a boy? How does the angle that your elbow/knee is bent affect the circumference of your upper arm/thigh? **Research** Why do different types of vitamins keep us healthy and which foods can we find them in? **Pattern Seeking** Do male humans have larger skulls than female humans? **Identifying, grouping and classifying** How do the skeletons of different animals compare? How can we group the food that we eat? **Scientific Discovery** Who is Marie Curie and why is she famous?	What colour flowers do pollinating insects prefer? **Identifying, grouping and classifying** How many different ways can you group our seed collection? **Scientific Discovery** Who is Wangari Maathai and why is she famous?
A.R.E. / skills progression (possible evidence)	**Rocks** • 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 • Can classify rocks in a range of different ways, using appropriate vocabulary	**Light** • Can describe how we see objects in light and can describe dark as the absence of light • Can state that it is dangerous to view the sun directly and state precautions used to view the sun, for example in eclipses • Can define transparent, translucent and opaque • Can describe how shadows are formed	**Plants** • Can explain the function of the parts of a flowering plant • Can describe the life cycle of flowering plants, including pollination, seed formation, seed dispersal, and germination • Can give different methods of pollination and seed dispersal, including examples

	• Can devise tests to explore the properties of rocks and use data to rank the rocks • Can link rocks changing over time with their properties e.g. soft rocks get worn away more easily • Can present in different ways their understanding of how fossils are formed e.g. in role play, comic strip, chronological report, stop-go animation etc. • Can identify plant/animal matter and rocks in samples of soil • Can devise a test to explore the water retention of soils **Forces and magnets** • Can give examples of forces in everyday life • Can give examples of objects moving differently on different surfaces • Can name a range of types 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 their results to describe how objects move on different surfaces • Can use their results to make predictions for further tests e.g. it will spin for longer on this surface than that, but not as long as it spun on that surface • Can use classification evidence to identify that some metals, but not all, are magnetic • Through their exploration, they can show how like poles repel and unlike poles attract, and name unmarked poles	• Can describe patterns in visibility of different objects in different lighting conditions and predict which will be more or less visible as conditions change • Can clearly explain, giving examples, that objects are not visible in complete darkness • Can describe and demonstrate how shadows are formed by blocking light • Can describe, demonstrate and make predictions about patterns in how shadows vary **Animals, including humans** • 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 • Can name some bones that make up their skeleton, giving examples that support, help them move or provide protection • Can describe how muscles and joints help them to move • Can classify food into those that are high or low in particular nutrients • Can answer their questions about nutrients in food, based on their gathered evidence • Can talk about the nutrient content of their daily plan • Use their data to look for patterns (or lack of them) when answering their enquiry question • Can give similarities e.g. they all have joints to help the animal move, and differences between skeletons	• Can explain observations made during investigations • Can look at the features of seeds to decide on their method of dispersal • Can draw and label a diagram of their created flowering plant to show its parts, their role and the method of pollination and seed dispersal

	• Can use test data to rank magnets				
Prior knowledge check **Concept questions** Drake > CURRICULUM DEV > Science > 2024/25> Concept questions **Flashback questions** Drake > CURRICULUM DEV > Science > 2024/25> Flashback questions	**Concept Questions- Rocks:** 1st lesson of the unit: Concept questions- evidence in books. **Flashback Questions:** Every lesson- begin with 3 flashback questions- evidence in books.	**Concept Questions- Forces and magnets:** 1st lesson of the unit: Concept questions- evidence in books. **Flashback Questions:** Every lesson- begin with 3 flashback questions- evidence in books.	**Concept Questions- Light:** 1st lesson of the unit: Concept questions- evidence in books. **Flashback Questions:** Every lesson- begin with 3 flashback questions- evidence in books.	**Concept Questions- Animals:** 1st lesson of the unit: Concept questions- evidence in books. **Flashback Questions:** Every lesson- begin with 3 flashback questions- evidence in books.	**Concept Questions- Plants:** 1st lesson of the unit: Concept questions- evidence in books. **Flashback Questions:** Every lesson- begin with 3 flashback questions- evidence in books.
Assessment	Autumn mid-term Summative assessment: Head start Progress test A		Spring mid-term Summative assessment: Head start Progress test B		Summer mid-term Summative assessment: Head start Progress test C

	Origins 	Movement 	Conflict

YEAR 3 **Vocabulary**	**Working Scientifically:** Develop, enquiry, practical, enquiry, fair test, comparative, test, relationships, conclusion, accurate, thermometer, data logger, estimate, data, diagram, key (identifying), table, chart, bar chart, results, predictions, explanation, reason, similarity, difference, question, evidence, information, findings, criteria, values, properties, characteristics, questioning, observation, improvements, process **Rocks:** rock, stone, pebble, boulder, grain, crystals, soil, peat, sandy/chalk/clay soil, fossil, organic matter, sedimentary rock, igneous rock, metamorphic rock, properties, appearance, rock cycle, layers, crust, mantle, outer core, inner core, hard, soft, texture, absorb water, soil, marble, chalk, granite, sandstone, slate **Force and magnets:** move, movement, surfaces, forces, contact, push, pull, contact force, non-contact force, distance, magnet, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, poles (of magnets, North and South), magnetic force, magnetic materials, strength, iron, steel, nickel, maglev train	**Working Scientifically:** Develop, enquiry, practical, enquiry, fair test, comparative, test, relationships, conclusion, accurate, thermometer, data logger, estimate, data, diagram, key (identifying), table, chart, bar chart, results, predictions, explanation, reason, similarity, difference, question, evidence, information, findings, criteria, values, properties, characteristics, questioning, observation, improvements, process **Light:** light, light source, dark (absence of light), reflect, mirror, sun glasses, protection, shadow, opaque, mirror, reflective surface, ultraviolet rays, transparent, translucent, opaque, shiny, matt, surface, sunlight, dangerous **Animals, including humans:** nutrition, diet, skeleton, muscles, function, protection, support, protect, movement, bones, joints, skull, ribs, spine, food groups, nutrients, vitamins, minerals, protein, water, carbohydrates, fat, sugars, dairy, fibre, fruit and vegetables	**Working Scientifically:** Develop, enquiry, practical, enquiry, fair test, comparative, test, relationships, conclusion, accurate, thermometer, data logger, estimate, data, diagram, key (identifying), table, chart, bar chart, results, predictions, explanation, reason, similarity, difference, question, evidence, information, findings, criteria, values, properties, characteristics, questioning, observation, improvements, process **Plants:** photosynthesis, pollen, functions, roots, stem/trunk, leaves, flowers, nutrients, nutrition, air light, nutrients, soil, room to grow, transport (water), xylem vessels, life cycle, pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), reproduce, fertiliser
Sentence Stems	**Knowledge:** understand that… I wonder if… The picture reminds me of… The most important idea is… An example of…is…		

	I already know that… A type of…is… A…is different from a …because… …is the same as…because they both… …and …both have The science term that describes…is… The word I am thinking of is like… **Working scientifically:** First, I need to find out… I saw…which made me think… I think this was caused by… It would be easier if… How would I be able to check…? I predict that…because… I think…because… This happened because… I will test my prediction by… I have reached the conclusion that… My observations show that… There is a pattern…It shows that… …was caused by…