**2018 B1 Year 3 and 4 Science - Plants**
**Year B**
**Prehistoric Britain to Stone Age linked theme**
**Stephanie Head**

Please Note: There should be plenty of opportunities throughout the year for children to use the school/local environment to observe plant lifecycles with a particular focus on the different parts of a plant (e.g. comparing fruits and seeds and looking for examples of pollination). This could be done through an ongoing/monthly nature journal to observe, record and review over a period of time.

| Plants – Functions of Parts of a Plant) | Health - Health/Nutrition) | Animals - Skeletons and Movement) |
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| Pupils should be taught to:<br>▪ Identify and describe the functions of different parts of flowering plants: 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, including pollination, seed formation and seed dispersal.<br>▪ Roots grow downwards and anchor the plant.<br>▪ Water, taken in by the roots, goes up the stem to the leaves, flowers and fruit.<br>▪ Nutrients (not food) are taken in through the roots.<br>▪ Stems provide support and enable the plant to grow towards the light.<br>▪ Plants make their own food in the leaves using energy from the sun.<br>▪ Flowers attract insects to aid pollination.<br>▪ Pollination is when pollen is transferred between plants by insects, birds, other animals and the wind.<br>▪ Fertilisation occurs in the ovary of the flower.<br>▪ Seeds are formed as a result of fertilisation.<br>▪ Many flowers produce fruits which protect the seed and/or aid seed dispersal.<br>▪ Seed dispersal, by a variety of methods, helps ensure that new plants survive.<br>▪ Plants need nutrients to grow healthily (either naturally from the soil or from fertiliser added to soil).<br><br>***Notes and Guidance (non-statutory):***<br>Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.<br>**Note:** Pupils can be introduced to the idea that plants can make their own food, but at this stage they do not need to understand how this happens.<br><br>***Pupils might work scientifically by:***<br>▪ Comparing the effect of different factors on plant growth, for example the amount of light, the amount of fertiliser;<br>▪ Discovering how seeds are formed by<br>▪ Observing the different stages of plant cycles over a period of time;<br>▪ Looking for patterns in the structure of fruits that relate to how the seeds are dispersed.<br>▪ Observing how water is transported in plants, for example, by putting cut, white carnations into coloured water.<br>▪ Observing how water travels up the stem to the flowers. | Pupils should be taught to:<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>▪ An adequate and varied diet is beneficial to health (along with a good supply of air and clean water).<br>▪ Regular and varied exercise *from a variety of different activities* is beneficial to health (focus on *energy in versus energy out*. Include information on making informed choices).<br><br>***Notes and Guidance (non-statutory):***<br>Pupils should continue to learn about the importance of nutrition<br><br>**Pupils might work scientifically by:**<br>▪ Comparing and contrasting the diets of different animals (including their pets).<br>▪ Decide ways of grouping them according to what they eat.<br>▪ Researching different food groups and how they keep us healthy.<br>▪ Designing meals based on what they find out. | Pupils should be taught to:<br>▪ Identify that humans and some other animals have skeletons and muscles for support, protection and movement.<br>▪ Identify animals (vertebrates) which have a skeleton which supports their body, aids movement & protects vital organs (be able to name some of the vital organs).<br>▪ Identify animals without internal skeletons/backbones (invertebrates) and describe how they have adapted other ways to support themselves, move & protect their vital organs.<br>▪ Know how the skeletons of birds, mammals, fish, amphibians or reptiles are similar (backbone, ribs, skull, bones used for movement) and the differences in their skeletons.<br>▪ Know that muscles, which are attached to the skeleton, help animals move parts of their body.<br>▪ Explore how humans grow bigger as they reach maturity by making comparisons linked to body proportions and skeleton growth – e.g. do people with longer legs have longer arm spans?<br>▪ Recognise that animals are alive; they move, feed, grow, use their senses and reproduce.<br><br>***Notes and Guidance (non-statutory):***<br>Pupils should be introduced to the main body parts associated with the skeleton and muscles, finding out how different parts of the body have special functions.<br><br>**Pupils might work scientifically by:**<br>▪ Identifying and grouping animals with and without skeletons.<br>▪ Observing and comparing their movement.<br>▪ Exploring ideas about what would happen if humans did not have skeletons. |

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**Year B**
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| Material Properties - Rocks) | Light and Astronomy - Light, reflections and shadows) | Forces – Non contact forces) |
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| Pupils should be taught to:<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 when things that have lived are trapped within rock.<br>▪ Recognise that soils are made from rocks and organic matter.<br>▪ Rocks and soils can feel and look different.<br>▪ Rocks and soils can be different in different places/environments.<br><br>**Notes and Guidance (non-statutory):**<br>Linked with work in geography, pupils should explore different kinds of rocks and soils, including those in the local environment.<br><br>**Pupils might work scientifically by:**<br>▪ Observing rocks, including those used in buildings and gravestones.<br>▪ Exploring how and why they might have changed over time.<br>▪ Using a hand lens or microscope to help them.<br>▪ Identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them.<br>▪ Research and discuss the different kinds of living things whose fossils are found in sedimentary rock.<br>▪ Explore how fossils are formed.<br>▪ Explore different soils.<br>▪ Identify similarities and differences between them.<br>▪ Investigate what happens when rocks are rubbed together or what changes occur when they are in water.<br>▪ Raise and answer questions about the way soils are formed. | Pupils should be taught to:<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 their eyes.<br>▪ Recognise that shadows are formed when the light from a light source is blocked by a solid object.<br>▪ Find patterns in the way that the size of shadows change**.**<br><br>**Notes and Guidance (non-statutory):**<br>Pupils should explore what happens when light reflects off a mirror or other reflective surfaces, including playing mirror games to help them answer questions about how light behaves. They should think about why it is important to protect their eyes from bright lights. They should look for, and measure shadows and find out how they are formed and what might cause shadows to change.<br>**Note:** Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses.<br><br>**Pupils might work scientifically by:**<br>▪ Looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes. | Pupils should be taught to:<br>▪ Compare how some 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 which poles are facing.<br><br>**Notes and Guidance (non-statutory):**<br>Pupils should observe that magnetic forces can act without direct contact, unlike most forces, where direct contact is necessary (for example, opening a door, pushing a swing). They should explore the behaviour and everyday uses of different magnets (for example, bar, ring, button, horseshoe).<br><br>**Pupils might work scientifically by:**<br>▪ Comparing how different things move and grouping them.<br>▪ Raising questions and carrying out tests to find out how far things move on different surfaces.<br>▪ Gathering and recording data to find answers to their questions.<br>▪ Exploring the strengths of different magnets and finding a fair way to compare them.<br>▪ Sorting materials into those that are magnetic and those that are not.<br>▪ Looking for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another.<br>▪ Identifying how these properties make magnets useful in everyday items and suggesting creative uses for different magnets. |

# 2018 B1 Year 3 and 4 Science - Plants Template

| **Y3**<br>**Sort / group / compare / classify / identify** | **Research**<br>*finding things out using a wide range of secondary sources of information and recognising that scientific ideas change and develop over time* | **Modelling** | **Recording of 'Explore / Observe'**<br>*developing a deeper understanding of a wide range of scientific ideas encountering more abstract ideas* | **Questioning**<br>*asking their own questions about scientific phenomena* | **Planning**<br>*using different types of scientific enquiry making decisions about and explaining choices for testing* |
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| ▪ Compare and contrast functions, diets, teeth, changes over time.<br>▪ Record similarities and differences.<br>▪ Decide ways and give reasons for sorting, grouping, classifying, identifying things/objects, living things, processes or events based on specific characteristics. | ▪ Create/invent design something based on what they have found out applying both research and/or practical experiences (Y3/4).<br>▪ Find out about the work of famous scientists historical and modern day (Y3/4).<br>▪ Finding things out using secondary sources of information (Y3/4). | ▪ Act out something to represent something else about the world around us. | ▪ Observe and record relationships between structure and function (Y3/4).<br>▪ Observe and record changes /stages over time (Y3/4).<br>▪ Explore / observe things in the local environment / real contexts and record observations (Y3/4).<br>▪ Record observations/explorations/ processes using simple scientific language. | ▪ Explore their own ideas about 'what if….?' scenarios e.g. humans did not have skeletons.<br>▪ Begin to understand that some questions are testable/ can be tested in the classroom and some cannot.<br>▪ Within a group suggest relevant questions about what they observe and about the world around them. | ▪ Help to decide about how to set up a simple fair test and begin to recognise when a test is not fair.<br>▪ As a group, begin to make some decisions about the best way of answering their questions.<br>▪ With support/as a group, set up simple practical enquiries incl. comparative and fair tests e.g. make a choice from a list of at least one variable that needs to be kept the same when conducting a fair test.<br>▪ Find/suggest a way to compare things e.g. materials, magnets. |

| **Equipment and measurement**<br>*increasing complexity with increasing accuracy and precision make their own decisions about the data to collect* | **Communicating Recording**<br>*recording data, reporting findings, presenting findings* | **Considering the results of an investigation / writing a conclusion** | | | **Collaborating** |
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| | | **Describe results**<br>*Looking for patterns analysing functions, relationships and interactions more systematically* | **Explain results**<br>*Draw conclusions based on evidence* | **Trusting my results** | |
| ▪ Collect data from their own observations and measurements, using notes/ simple tables/standard units.<br>▪ Help to make some decisions about what observations to make, how long to make them for and the type of simple equipment that might be used.<br>▪ Make simple accurate measurements using whole number standard units, using a range of equipment.<br>▪ Gathering data in a variety of ways to help in answering questions.<br>▪ Learn how to use new equipment, e.g. data loggers. | ▪ Record and present findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings annotated, pictorial representations, labelled diagrams, simple tables, bar charts [using ranges and intervals (scales) chosen for them] displays or presentations.<br>▪ Record, classify and present data in a variety of ways to help in answering questions.<br>▪ Communicate their findings in ways that are appropriate for different audiences. (Y3/4). | ▪ Describe and compare the effect of different factors on something.<br>▪ With help, look for changes and patterns in their observations and data.<br>▪ Use their results to consider whether they meet predictions. | ▪ Read and spell scientific vocabulary correctly and with confidence (Y3/4).<br>▪ Use their own experience and some evidence or results to draw simple conclusions and answer questions.<br>▪ Talk about and record their findings using simple scientific language.<br>▪ Explain why things have happened. | ▪ Say whether what happened was what they expected and notice any odd results that seem odd.<br>▪ Begin to recognise when a test is not fair and suggest improvements. | ▪ Act out something to represent something else about the world around us. |

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| ▪ Explore observe with increased accuracy using a hand lens or microscope. | | | | | |

**Please Note:** There should be plenty of opportunities throughout the year for children to use the school/local environment to observe and identify how a habitat changes. This could include a focus on the relationships between the plants and animals within a habitat. This could be done through an ongoing/monthly nature journal to observe, record and review over a period of time.

| Environment – Living things and their habitats) | Animals – Teeth, Eating and Digestion) |
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| Pupils should be taught to:<br>▪ 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 and wider environment.<br>▪ Recognise that environments can change and that this can sometimes pose dangers to living things.<br>▪ Use and make identification keys for plants and animals.<br><br>**Notes and Guidance (non-statutory):**<br>Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants, Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.<br><br>**Note:** Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.<br><br>Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks or garden ponds, and the negative effects of population and development, litter or deforestation.<br><br>**Pupils might work scientifically by:**<br>▪ Using and making simple guides or keys [sorting, grouping, comparing, classifying] to explore and identify local plants and animals.<br>▪ Making a guide [sorting, grouping, comparing, classifying] to local living things.<br>▪ Raising and answering questions based on their observations of animals. | Pupils should be taught to:<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 how teeth and gums have to be cared for in order to keep them healthy.<br><br>**Notes and Guidance (non-statutory):**<br>Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them understand their special functions.<br><br>**Pupils might work scientifically by:**<br>▪ Comparing the teeth of carnivores and herbivores.<br>▪ Suggesting reasons for differences.<br>▪ Finding out what damages teeth and how to look after them.<br>▪ Drawing and discussing their ideas about the digestive system.<br>▪ Comparing them with models or images. |

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| ▪ What they have found out about other animals that they have researched. | |

**2018 B1 Year 3 and 4 Science - Plants Template**

## Material Properties and Changes – States of Matter)

Pupils should be taught to:

- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
- Solids, liquids and gases can be identified by their observable properties.
- Solids have a fixed size and shape (the size and shape can be changed but it remains the same after the action).
- Liquids can pour and take the shape of the container in which they are put.
- Liquids form a pool not a pile.
- Solids in the form of powders can pour as if they were liquids but make a pile not a pool.
- Gases fill the container in which they are put.
- Gases escape from an unsealed container.
- Gases can be made smaller by squeezing/pressure.
- Liquids and gases can flow.

**Notes and Guidance (non-statutory):**

Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.
**Note:** Teachers should avoid using materials where heating is associated with chemical change, e.g. through baking or burning.

**Pupils might work scientifically by:**

- Grouping and classifying a variety of different materials.
- Exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party).
- Researching the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.
- Observing and recording evaporation over a period of time, such as a puddle in the playground or washing on a line.
- Investigating the effect of temperature on washing drying or snowmen melting.
- Additional suggestion from Lancashire for working scientifically opportunities which enhance learning and support using ICT.
- This unit provides an ideal opportunity for using data logging equipment to detect/measure and compare temperatures.

## Sound

Pupils should be taught to:

Vibrations

- Identify how sounds are made, associating some of them with something vibrating.
- Recognise that vibrations from sounds travel through a medium to the ear.
- Find patterns between the volume of a sound and the strength of the vibrations that produced it.
- Recognise that sounds get fainter as the distance from the sound source increases.
- Sounds can be made in a variety of ways (pluck, bang, shake, blow) using a variety of things (instruments, everyday materials, body).
- Sounds travel away from their source in all directions.
- Vibrations may not always be visible to the naked eye.

**Pitch**

- Find patterns between the pitch of a sound and features of the object that produced it.
- Sounds can be high or low pitched.
- The pitch of a sound can be altered.
- Pitch can be altered either by changing the material, tension, thickness or length of vibrating objects or changing the length of a vibrating air column.

Muffling/blocking sounds

- Recognise that vibrations from sounds travel through a medium to the ear.
- Sounds are heard when they enter our ears (although the structure of the ear is not important key learning at this age phase).
- Sounds can travel through solids, liquids and air/gas by making the materials vibrate.
- Sound travel can be reduced by changing the material that the vibrations travel through.
- Sound travel can be blocked.

**Notes and Guidance (non-statutory):**

Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.

**Pupils might work scientifically by:**

- Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses.
- They might make ear muffs from a variety of different materials to investigate which provides the best insulation against sound.
- They could make and play their own instruments by using what they have found out about pitch and volume.

Additional suggestion from Lancashire for working scientifically opportunities which enhance learning and support using ICT across the curriculum

- This unit provides an ideal opportunity for using data logging equipment to detect/measure and compare sounds.

## Electricity

Pupils should be taught to:

- 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.
- Electricity can be dangerous.
- Electricity sources can be mains or battery.
- Batteries 'push' electricity round a circuit and can make bulbs, buzzers and motors work.
- Faults in circuits can be found by methodically testing connections.
- Drawings, photographs and diagrams can be used to represent circuits (although standard symbols need not be introduced until UKS2).

**Notes and Guidance (non-statutory):**

Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in Year 6.
**Note:** Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.

**Pupils might work scientifically by:**

- Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.

| **Sort / group / compare / classify / identify** | **Research**<br>*finding things out using a wide range of secondary sources of information and recognising that scientific ideas change and develop over time* | **Modelling** | **Recording of 'Explore / Observe'**<br>*developing a deeper understanding of a wide range of scientific ideas encountering more abstract ideas* | **Questioning**<br>*asking their own questions about scientific phenomena* | **Planning**<br>*using different types of scientific enquiry making decisions about and explaining choices for testing* |
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| ▪ Make a simple guide to local living things.<br>▪ Use guides or simple keys to classify / identify [local small invertebrates].<br>▪ Use their observations] to identify and classify.<br>▪ Record similarities, differences or changes related to simple scientific ideas or processes or more complex groups of objects/living things/events and begin to give reasons for these. | ▪ Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.<br>▪ Create/invent/ design something based on what they have found out applying both research and/or practical experiences. (Y3/4).<br>▪ Find out about the work of famous scientists (historical & modern day) (Y3/4). | ▪ Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see.<br>▪ Suggest their own ideas on a concept and compare these with models or images. | ▪ Suggest their own ideas on a concept and compare these with what they observe / find out.<br>▪ Develop simple descriptions from their observations use relevant scientific language to discuss their ideas.<br>▪ Observe and record relationships between structure and function (Y3/4).<br>▪ Observe and record changes /stages over time (Y3/4).<br>▪ Explore / observe things in the local environment / real contexts and record observations (Y3/4). | ▪ Choose/select a relevant question that can be answered [by research or experiment/test].<br>▪ Ask/raise their own relevant questions with increasing confidence and independence about what they observe and about the world around them. | ▪ Investigate the effect of something on something else.<br>▪ Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions [is a fair test the best way to investigate their question].<br>▪ Recognise when a test is necessary.<br>▪ Carry out simple fair tests [with increasing confidence and make some of the planning decisions about what to change and measure/observe]. |

| **Equipment and measurement**<br>*increasing complexity with increasing accuracy and precision make their own decisions about the data to collect* | **Communicating Recording**<br>*recording data, reporting findings, presenting findings* | **Considering the results of an investigation / writing a conclusion** | | | **Collaborating** |
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| | | **Describe results**<br>*Looking for patterns analysing functions, relationships and interactions more systematically* | **Explain results**<br>*Draw conclusions based on evidence* | **Trusting my results** | |
| ▪ Begin to identify where patterns might be found and use this to begin to identify what data to collect.<br>▪ Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used.<br>▪ Learn how to use new equipment, such as data loggers & measure temperature in degrees Celsius (°C) using a thermometer.<br>▪ Understand precautions for working safely.<br>▪ Collect and record data from their own observations and measurements, using notes/simple tables/standard units, to help to make decisions.<br>▪ Make accurate measurements using standard units [and more complex units and parts of units] using a range of equipment. | ▪ Record findings using simple scientific language and vocabulary, including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations.<br>▪ Begin to select the most useful ways to record, classify and present data from a range of choices.<br>▪ Make decisions on how best to] communicate their findings in ways that are appropriate for different audiences. (Y3/4) | ▪ Notice/find patterns in their observations and data.<br>▪ Describe the effect of something/different factors on something else.<br>▪ Help to make decisions about how to analyse their data. | ▪ Begin to develop their ideas about relationships and interactions.<br>▪ Reporting on findings from enquiries [beginning to identify the scientific facts in their data].<br>▪ Use relevant scientific language to discuss, communicate, report their findings.<br>▪ Read and spell scientific vocabulary correctly and with confidence (Y3/4). | ▪ Use results to suggest improvements, new questions and predictions for setting up further tests.<br>▪ With help, pupils should look for similarities and differences in their data [between different groups of results]. | ▪ Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see.<br>▪ Suggest their own ideas on a concept and compare these with models or images. |

| Possible Cross-curricular links, especially opportunities for English, Mathematics and Computing within teaching: | |
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| English links | • Research and notetaking |
| Mathematics links | • Venn diagrams/Carroll diagrams |
| Computing links | • Research |
| Other links | • |

**Possible Experiences including visits/visitors/other:**

**Consider what could augment your planning to really enthuse the children in your class:**

- Hands on activities
- Rock box
- Link to topic unit

**Display/Resources:**

**Consider what resources could be brought into the classroom and what display work could be completed either before/during or after topic is taught:**

| Session | Key Objective from skills listed above (What is it that you want the children to learn?) | Possible Activities including use of Computing and other technologies, and showing at least 3 differentiations | Outcomes/Evidence of what they have learnt (Where will this be found? Will it be in a book? Topic book? Display? Photographic evidence? | Possible extension into homework if appropriate to enhance and deepen learning |
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| 1 | To be able to identify naturally occurring rocks and explore their uses. | • What is a rock? Where do rocks come from? Invite children to share their ideas, then go through the information on the slides.<br>• Show children the picture on the slide and see if they can spot any rocks. Which occur naturally and which do not? Children to discuss ideas.<br>• Explain that there are lots of different types of rock and that they can be used for many different things.<br>Lots of naturally occurring rocks can be used as they are. Some other materials that look like rocks (e.g. bricks and concrete slabs) are actually man-made.<br>• Go through each example on the slides. Is this natural or man-made? Children to offer ideas then go through the answers.<br>• Go through some different types of naturally occurring rock and their uses on the slides.<br><br>Lower ability:<br>Provide children with a set of Picture Cards A and two hoops. | Plenary<br>Show children the pictures of Stonehenge on the slides or give children a set of Picture Cards B.<br>Would you say this structure is natural or man-made?<br>Give children some time to discuss their ideas.<br>Establish with the class that the rocks are naturally occurring but they have been placed and positioned by humans.<br>How do you think they got there? Explain that no one is really sure and that there is a | |

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| | | Children to organise the pictures of the rocks into the hoops – one hoop for naturally occurring rocks and one hoop for man-made.<br>Remind children that naturally occurring rocks can be shaped so they suit the purpose they are being used for.<br>Middle ability:<br>Provide children with a set of Picture Cards A and ask them to organise them into two piles - natural and man-made. When children have completed their two piles, note down the rocks into the correct column on worksheet 1A and then describe five uses for naturally occurring rocks.<br>Higher ability:<br>On worksheet 1B, children to colour in the naturally occurring rocks in one colour and the man-made 'rocks' in another colour, then think of as many uses for naturally occurring rocks as they can.<br>Challenge children to find more than their partner. Children could use books, dictionaries, the internet, etc., to help them find the answers. | lot of controversy about this monument.<br><br>ASSESSMENT QUESTIONS:<br>• Do children know that rocks are used for a variety of purposes?<br>• Can children identify some common rocks?<br>• Can children identify rocks that are naturally occurring and those that are man-made? | |
| 2 | To be able to group rocks according to their characteristics. | • Show children the pictures of the different rocks on the slides. How could you organise these rocks into groups? Children to think, pair, share their ideas.<br>• Show children how the rocks have been grouped. What criterion has been used to group these rocks?<br>Children to offer ideas then go through the answer on the slides. Repeat with the second criterion<br>• Show children how different diagrams and charts can be used to organise rocks into categories. Show children the Venn diagram on the slides. Can you think of a rock that would go in the middle of the two circles? On the next slide, ask children to see if they think the rocks have been sorted correctly on the Venn diagram, giving reasons for their answers.<br>• Show children the Carroll diagram. Can you spot the rock in the wrong place?<br>• Why do you think it is important to be able to group rocks according to their characteristics? Invite children to share their ideas.<br><br>Mixed pairs:<br>• Provide children with the Picture Cards in small groups. As a class, challenge children to separate the rocks in the pictures into two categories (e.g. rough and smooth). Give children a time limit to sort their rocks into these two categories then discuss how each group grouped them. Did you all group them in the same way? If not, why not? What were the differences?<br>• Repeat this several times with different categories (e.g. colour, arrangements of particles, shape, etc.).<br><br>One group real rocks then swap over | Plenary<br>How easy did you find it to sort your rocks into groups? What was the most difficult part about deciding which group to put your rocks into? Invite children to share their ideas, explaining the processes they went through to make decisions based on their observations.<br><br>ASSESSMENT QUESTIONS:<br>• Can children suggest ways of grouping rocks according to their characteristics?<br>• Can children observe and compare rocks, and put them into different categories?<br>• Can children justify their choices and explain their decisions? | |

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| 3 | To be able to plan, carry out and evaluate<br>experiments to compare rocks. | Do you know what the word 'erosion' means? Children to think, pair, share their ideas then go through the explanation on the slides.<br>• Explain that although rocks are generally very hard and strong, it is possible to wear them away. Show children the pictures of the Grand Canyon on the slides and explain how the formations were formed over thousands of years by water wearing away (eroding) the rock.<br>• How do you think we could set up an experiment to test different rocks to see how much they wear away? Give children some time to discuss ideas then share with the class.<br>• Go through the suggestion on the slides.<br>• Do you know what the word 'permeable' means? Children to think, pair, share their ideas then go through the explanation on the slides.<br>• How could you test the permeability of different rocks? Again, children to think, pair, share their ideas then go through the explanation on the slides.<br><br>ALL IN MIXED ABILITY GROUPS:<br>ACTIVITY 3C, children to plan the permeability test. Provide children with a selection of rocks, a beaker of water and a pipette. Children to test each of the rocks to see if the rock absorbs the water or if it just runs off. Challenge children to then order the rocks from the most permeable to the least permeable. | Plenary<br>What have we found out from our experiments today? Children to share their ideas. How do our results help us to find out what different rocks would be useful for? (e.g. chalk is good for blackboards and writing on playgrounds because it wears away easily and so leaves a mark; granite and marble are very hard so they do not wear away easily, making them good for kitchen worktops, etc.)<br><br>ASSESSMENT QUESTIONS:<br>• Do children know what the terms 'erosion' and 'permeable' mean?<br>• Can children plan and carry out an experiment to compare rocks based on certain characteristics?<br>• Can children evaluate their results and draw conclusions? | |
| 4 | To explore soil and how it is formed. | • What is soil? What is soil used for? Invite children to share their ideas.<br>• Read children the facts about soil on the slides. From what we have read, why is soil important?<br>Children to think, pair, share their ideas, then go through the information on the slides about what soil is, how it is formed and why it is important.<br>• Explain that just like rocks, there are different types of soil. Show children the pictures of different soils on the slides. What differences can you see between these different types of soil?<br>• Show children the suggestions for how you could order the soil samples, e.g. by colour. As a class, decide the order for each one and write the numbers in the boxes.<br><br>MIXED ABILITY GROUPS:<br>• Organise to take children out on a walk around the school or local area to collect some different soil samples. Provide children with a trowel and three containers (with lids) in small groups so that they can | Plenary<br>If you kept digging down into the soil, what do you think you would find? What might be underneath the bedrock? How could we find out? Invite children to share their ideas.<br><br>ASSESSMENT QUESTIONS:<br>• Do children know that soil is made up of rocks and decaying organic matter?<br>• Do children know that there are different types of soil?<br>• Do children know that there are different layers of soil? | |

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| | | collect 3 different samples. Make sure children mark on each separate container where the soil was found (e.g. in a flower bed, under a tree, etc.).<br>• Back in the classroom, children to investigate the soil they have collected. What colour is it? How big are the particles? Is it wet or dry? Children could use graded sieves (or margarine tubs with holes pierced in the bottom) to separate out the particles of each sample to get a better idea of what they contain and how big the particles are.<br>• Children to discuss these questions as a group and then record the answers on worksheet 5C. | | |
| 5 | To find out what fossils are and how they are formed. | • What kind of animals do you think lived in prehistoric times? How do you think people found out about the kinds of animals that lived thousands or even millions of years ago when there was no writing and no photographs? Invite children to share their responses.<br>• Explain that one of the ways we know about the prehistoric animals is by looking at fossils. Do you know what a fossil is? Again, invite children to share their ideas.<br>• Go through the information on the slides about fossils and how they are formed. Explain that dinosaur fossils have been found all over the world which scientists can use to find out about animals that lived millions of years ago. Show children some pictures of dinosaur skeletons on the slides. What can you find out about these dinosaurs just from looking at their skeletons? What can't you find out?<br><br>ACTIVITY IN HOME TEAMS:<br><br>Give children a copy of the Role Play Card in groups of four. Children must choose how to assign roles within the group. They will need: a palaeontologist, an interviewer, a camera operator and a director.<br>• Children are asked to prepare a role-play interview with Dino TV to explain what they have found and what they can learn from it. They are challenged to think of interesting interview questions that they can ask and consider how the palaeontologist should answer the questions. They can then act out their interviews and film them. These can then be played for the rest of the class.<br>• Whose role-play do you think was most informative? Whose told us most about how fossils are formed? Discuss ideas as a class. | Plenary<br>How many different species of dinosaur can you name? Give children a few minutes to discuss their ideas between them, then share with the class. Do you know anything about any of these dinosaurs?<br><br>ASSESSMENT QUESTIONS:<br>• Do children understand how fossils are formed?<br>• Can children describe how a fossil is formed?<br>• Do children know how fossils can help palaeontologists find out about the past? | |
| 6 | To be able to identify and describe a variety of dinosaurs. | • Show children the picture of a palaeontologist excavating a dinosaur fossil on the slides. What is this palaeontologist doing? Why? Children to think, pair, share their ideas. What can you remember about how fossils are formed? | Plenary<br>Go through the quiz on the slides asking children if | |

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| | | • Apart from the fact that we know about dinosaurs from their fossils, what else can you tell me about dinosaurs? Showing the questions on the slides as prompts, encourage children to share their knowledge of dinosaurs.<br>• Go through the information on the slides about when the dinosaurs lived and the other information about different types of dinosaurs.<br>• Show children the picture of a dinosaur on the slides. What can you tell me about this dinosaur just from looking at this picture? What can't you learn about it? What would you like to find out about it? Invite children to share their ideas then annotate the picture on the following slide.<br><br>ACTIVITY:<br>• Ask children to get into pairs or small groups and provide each group with one of the Dinosaur Cards and worksheet 2A. Children are challenged to find out about the dinosaur they have been given, after noting what they can already find out about the dinosaur from the picture.<br>• Children to carry out some research to find the answers to the questions on the worksheet, as well as the three questions they have chosen to investigate for themselves.<br>• Once children have completed their research, challenge them to present the information in a fun and Informative way on a sheet of A4 paper. This could be in any format they wish, as long as they include all the information they have found out.<br>• When they have finished, they can present their findings to the rest of the class (or to small groups). The finished pages could also be collated to create a class book on dinosaurs. | they can identify the dinosaurs shown from their learning during the lesson.<br>Children to hold one, two or three fingers up to show what they think the answer is, then check on the slides.<br>Alternatively, provide children with the Picture Cards and Name Cards in pairs or small groups to see how many dinosaurs they can match to their correct name.<br><br>ASSESSMENT QUESTIONS:<br>• Do children understand that dinosaurs inhabited the Earth millions of years ago and over a period of millions of years?<br>• Can children describe the features of a variety of different dinosaurs?<br>• Can children identify a variety of different dinosaurs? | |
| 8 | To be able to identify, describe and classify dinosaurs. | • How many species of dinosaur can you remember? Can you describe two features of each one? Children to think, pair, share their ideas.<br>• Recap the different groups of dinosaurs on the slides and relate this to how we group animals today.<br>• Show children the illustrations of several different dinosaurs. How could you sort these dinosaurs into groups? What criteria could you use? Invite children to share their ideas.<br>• Show children how the dinosaurs have been grouped on the slides. Can you work out what the criterion for sorting these dinosaurs is? Children to discuss ideas, then reveal answer on the slides. Repeat this with the other example.<br><br>Lower ability:<br>Provide children with the Dinosaur Species Sheet and worksheet 3A. Children to sort the dinosaurs into the correct section of the various tables. | Plenary<br>Provide children with a copy of the Dinosaur Classification sheet and show them the classification key on the slides. Can you work out the name of each of the dinosaurs on the sheet by reading the key? Give children some time to work this out, then check the answers on the slides.<br><br>ASSESSMENT QUESTIONS:<br>• Can children describe the features of different dinosaurs? | |

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| | | Middle ability:<br>Provide children with the Dinosaur Species Sheet and worksheet 3B. Children to sort the dinosaurs into the correct section of the Venn diagram. They can then create their own Venn diagram with their own criteria to sort them on worksheet 3C.<br>Higher ability:<br>Provide children with the Dinosaur Species Sheet and worksheet 3D. Children to sort the dinosaurs into the correct section of the Carroll diagram, then think of their own way of classifying them in the second Carroll<br>diagram. | • Can children sort dinosaurs into groups depending on different criteria?<br>• Can children choose their own way of sorting dinosaurs into different groups according to their features? | |
| 9 | To consider why the dinosaurs became extinct and<br>relate this to why species become endangered or<br>extinct today. | • What have we learned about dinosaurs so far? What can you tell me about them? Invite three children to each give one fact they have found out.<br>• Why do we not have dinosaurs in the world today? Explain that the dinosaurs became extinct about 65 million years ago but that experts still don't know why. What reasons can you think of for why the<br>dinosaurs might have died out? Children to discuss their ideas with a partner, then list some possibilities on the slides as a class.<br>• Go through current possible explanations for why the dinosaurs became extinct.<br>• Can animals become extinct today? Why or why not? Children to share their responses. Go through the information on the slides about some of the factors that can affect the survival of a species today and<br>some of the ways in which humans can try and keep endangered animals alive.<br><br>MODELLED:<br>. Children are to explain as fully as they can how each factor will have impacted on the dinosaurs and other organisms to help explain why their extinction was caused. Children to use the words around the worksheet to help them. Alternatively, children could create their own mind map in small groups on a large sheet of paper.<br><br>ACTIVITY:<br>On worksheet 4A, children to create a cartoon showing some of the theories for why dinosaurs became extinct.<br>Children can use Information Sheet 4A as a reference | Plenary<br>What can we do personally to help make sure that endangered species do not become extinct? Give children some time to discuss their ideas with a partner, then share with the rest of the class.<br>• Can children suggest some of the possible factors that caused the extinction of dinosaurs?<br>• Can children identify and describe some of the environmental factors that cause animals to become endangered today?<br>• Can children suggest some ways in which humans can act to protect endangered species? | HOMEWORK:<br><br>• Distribute one of the Endangered Animal Cards to each child and tell them that their task today is to find out about the endangered animal they have been given. Children are to use a variety of sources of information, such as books and/or the internet, to find out about their given animal. Children can record their findings on worksheet 4D.<br>• Once all children have finished their research, the worksheets can be collated to create a class book on endangered animals. |