



| Year Group | Autumn Term 1  | Autumn Term 2                     | Spring Term 1             | Spring Term 2      | Summer Term 1                    | Summer Term 2                                  | Additional Events   |
|------------|--|-----------------------------------|---------------------------|--------------------|----------------------------------|--|---|
| Nursery    | It's good to be me.<br>Life cycle.   | It's good to be part of a family. | My family and their jobs. | We are all special | Little explorers, I wonder what? | How does your garden grow?<br>Starting school. |   |
|            | <p><u>Rationale</u> – to encourage curiosity in the world around them by providing opportunities for open ended play and exploration</p> <p><u>Skills</u><br/><u>Communication and Language</u></p> <ul style="list-style-type: none"> <li>- Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"</li> </ul> <p><u>Physical Development</u></p> <ul style="list-style-type: none"> <li>- Make healthy choices about food, drink, activity and discussing the importance of toothbrushing.</li> </ul> <p><u>Understanding the World</u></p> <ul style="list-style-type: none"> <li>• Use all their senses in hands-on exploration of natural materials.</li> <li>• Explore collections of materials with similar and/or different properties.</li> <li>• Talk about what they can see, using a wide vocabulary.</li> <li>• Begin to make sense of their own life-story and family's history.</li> <li>• Explore how things work.</li> <li>• Plant seeds and care for growing plants.</li> <li>• Understand the key features of the life cycle of a plant and an animal.</li> <li>• Begin to understand the need to respect and care for the natural environment and all living things.</li> <li>• Explore and talk about different forces they can feel.</li> <li>• Talk about the differences between materials and changes they notice.</li> </ul> <p><u>Substantive Vocabulary</u> – seasons, change, leaf, plants, fall, habitat, living, warm, sunlight, grow, tree, Leaf, flower, seed, same, different, ice, frozen, melted, icicle, life cycle, egg, chick, hen, hatch, bud, magnet, sink, float, smooth, hard, soft, rough, shiny, pig, cow, sheep, dog, cat, horse.</p> |                                   |                           |                    |                                  |  | <p><b>On-site learning:</b><br/>Skype a scientist – linked to different topics.<br/>British Science week.</p> <p><b>Potential off-site learning:</b><br/>Outdoor learning</p> |

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|   | <p><u>Knowledge-</u><br/>Explore the natural world around them:</p> <ul style="list-style-type: none"> <li>• Notice the effect of season on plants, weather, clothing</li> <li>• To know how to sort and group by simple properties including material something is made from, if it is an animal/plant/person</li> <li>• Opportunities around pulling and pushing forces e.g. wagons, pullies in the sand etc.</li> <li>• Baking and cooking activities</li> <li>• Melting</li> <li>• Growing plants – Grass Heads/Sunflowers</li> <li>• To know that we need to help us live?</li> <li>• Mini-beast hunt – looking at habitats and how to care for them</li> <li>• Changes in state – for example different ways to cook an egg</li> <li>• Life-cycle of a caterpillar/butterfly</li> </ul> |                                    |   |  |   |   |
| <p><b>Reception</b></p>   | <p><b>It's good to be me</b><br/><b>Seasons/Natural world: Autumn</b></p>   | <p><b>It's good to be you.</b></p> | <p><b>Who are you?</b><br/><b>Seasons/Natural world: Winter</b></p> | <p><b>Let's explore</b><br/><b>Seasons/Natural world: Spring</b></p> | <p><b>Near and Far</b><br/><b>Seasons/Natural world: Summer</b></p> | <p><b>On-site learning:</b><br/>Skype a scientist – linked to different topics.<br/>British Science week.</p> <p><b>Potential off-site learning:</b><br/>Stewarts park<br/>Outdoor learning</p> |
| <p><u>Skills</u><br/><u>Communication and Language</u></p> <ul style="list-style-type: none"> <li>• Learn new vocabulary.</li> <li>• Ask questions to find out more and to check what has been said to them.</li> <li>• Articulate their ideas and thoughts in well-formed sentences.</li> <li>• Describe events in some detail.</li> <li>• Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen.</li> <li>• Use new vocabulary in different contexts.</li> </ul> <p><u>Physical Development</u></p> <ul style="list-style-type: none"> <li>• Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> <li>○ regular physical activity</li> <li>○ healthy eating</li> <li>○ toothbrushing</li> <li>○ sensible amounts of 'screen time'</li> <li>○ having a good sleep routine</li> <li>○ being a safe pedestrian</li> </ul> </li> </ul> <p><u>Understanding the World</u></p> <ul style="list-style-type: none"> <li>• Explore the natural world around them.</li> <li>• Describe what they see, hear and feel while they are outside.</li> <li>• Recognise some environments that are different to the one in which they live.</li> <li>• Understand the effect of changing seasons on the natural world around them.</li> </ul> |   |                                    |   |  |   |   |
| <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>• Spring</li> <li>• Summer</li> <li>• Autumn</li> <li>• Winter</li> <li>• Seasons</li> <li>• Adjectives to describe the weather (e.g. sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow)</li> <li>• Animals (dog, cat, bird, horse, sheep, cow, pig, rabbit, bumblebee, mice)</li> </ul>   |   |                                    |   |  |   |   |

- Young, growth
- Plants, tree, bark, branch, twig, stick, leaf
- Horse chestnut tree, oak tree, conker, acorn
- Flowers, new life, buds, blossom wild flowers (daisy, dandelion)
- Habitat
- Adjectives to describe hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly)
- Adjectives to describe eyes (blue, brown, green, grey), skin (black, brown, white),
- Adjectives to describe height (big/tall, small/short, bigger/smaller)
- Adjectives to describe a family (baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family)
- Head, neck, face, shoulders, arms, legs, hands, feet, ankle, elbow, knee, fingers, toes, eyes, nose, mouth, chin, cheeks etc.

Substantive Knowledge-

- Pupils will enjoy learning about their body, their senses and how to be safe and healthy.
- Explore the natural world around them:
- Explore the outside area – the woodland area.
  - Describe what they can see (or have seen) on a walk outside.
  - Join in with songs and poems about the natural world e.g. Incey Wincey Spider.
  - Name and recognise some basic animals (cat, dog, sheep, cow, horse, pig) and consider their habitats.
  - Consider how do these animals differ to those found in other parts of the world (polar bear,

Substantive Knowledge-

- Pupils will learn about themselves and all the good things that make them unique and different to others.
- They will have opportunity to talk about themselves and the members of their family and/or household.

Substantive Knowledge-

Explore the natural world around them:

- Draw pictures of things I have seen in the natural world e.g. a flower.
- Look closely at animals/plants and notice the different parts e.g. do they have wings? How many legs does it have?
- Describe what they hear, see and feel in the outside environment.
- Recognise some flowers including daffodils and poppies.

Weather:

- Know that weather changes through the seasons.
- Describe some of the changes that happen in Autumn, Winter, Spring

Change of states for example:

- Explore ice melting.
- Know that ice is cold.
- Describe what is happening.
- Know that when ice melts it becomes water.
- Melting chocolate, consider the following questions: Will it stay the same when heated? Why has the chocolate melted?
- Explore floating and sinking in continuous provision areas.

Substantive Knowledge-

Explore the natural world around them:

- Recognise and name some minibeasts (snail, worm, ladybird, ant, spider), animals and birds (robin, blackbird).
- Look closely at the features of a minibeast and draw it e.g. a ladybird.
- Describe the changes taking place for example in the life cycle of a frog.
- Recognise and name a tadpole and frogspawn.
- Describe the life cycle of a caterpillar.
- Recognise and name a butterfly. Link this to how they have changed since being babies.

Weather:

- Describe some of the changes that happen in Summer.

Change of states:

- Explore magnets and a range of magnetic and non-magnetic objects. Say what they notice.
- Know that magnetic objects are attracted to magnets.
- Explore floating and sinking in continuous provision areas.

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|                        | <p>camel, zebra, penguin)</p> <p>Weather:</p> <ul style="list-style-type: none"> <li>• Discuss what the weather is like today.</li> <li>• Discuss the season and how we know it is that season.</li> <li>• Describe what happens in Autumn – leaves changing colour, leaves falling off the trees, weather getting colder and wetter.</li> <li>• Describe what happens in winter – cold weather, animals hibernate, trees bare, no flowers.</li> </ul> <p>Forces:</p> <ul style="list-style-type: none"> <li>• Explore floating and sinking.</li> <li>• Predict whether something will float or sink.</li> <li>• Test their prediction and say what happened.</li> </ul>             |  |  |  |  |
| <b>Science Capital</b> | <p>A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a></p> <p>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a></p> <p>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a></p> <p>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a></p> |  |  |  |  |

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| <b>Year 1</b>  | <b>Seasons</b> – Taught throughout the year.  |  |  | <b>On-site learning:</b><br>Skype a scientist – linked to different topics.<br>British Science week.<br>Fuji film engineering to visit and hold workshop<br><br><b>Potential off-site learning:</b><br>Washington Wetland Centre<br>Stewarts park.<br><br><b>Famous Scientists to study</b><br>Dr Jane Goodall<br>Dr David Attenbrough<br>Charles Macintosh<br>Liam Dutton<br>Beatrix Potter |
|  | <u>Rationale</u> – – to use real life and life experiences to make and articulate scientific observations of change over time.  |  |  |  |
|  | <u>National Curriculum Objectives</u><br>– Observe changes across the four seasons<br>- Observe and describe weather associated with the seasons and how day length varies  |  |  |  |
|  | <u>Substantive Knowledge – Seasonal Change</u><br><ul style="list-style-type: none"> <li>To know that in the UK, the day length is the longest at mid-summer (about 10 hours) and gets shorter each day until mid-winter (about 8 hours) before getting longer again.</li> <li>To know that the weather also changes with the seasons.</li> <li>To know that in the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer.</li> <li>To know that the changes in the weather cause many other changes. Some examples are: number of mini-beasts found outside; seed and plant growth; leaves on trees and types of clothes worn by people.</li> </ul> |  |  |  |
|  | <u>Substantive Vocabulary</u> – Winter, Spring, Summer, Autumn, weather, cold, warm, changes  |  |  |  |
| <b>Everyday Materials</b>  | <b>Plants</b>   | <b>Animals including Humans</b>  |  |  |
| <u>National Curriculum Objectives</u><br><ul style="list-style-type: none"> <li>Distinguish between an object and the material from which it is made</li> <li>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock</li> <li>Describe the simple physical properties of a variety of everyday materials</li> <li>Compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul> | <u>National Curriculum Objectives</u><br><ul style="list-style-type: none"> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees.</li> </ul>  | <u>National Curriculum Objectives</u><br><ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</li> <li>Describe and compare the structure of a variety of common animals</li> <li>Identify, name, draw and label basic parts of the human body and say which part of the body is associated with each sense.</li> </ul> |  |  |

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|   | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know that all objects are made of one or more material.</li> <li>To know from observation how to distinguish between materials made of wood, plastic, glass, metal, water, rock</li> <li>To know that an object is made from/of a material</li> <li>To know that materials can be hard, soft, strong, weak, absorbent, heavy, light, solid and runny, smooth and rough; these descriptions denote the properties of a material</li> <li>To know that matter (stuff) is made from tiny building blocks.</li> </ul>  | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know the meaning of deciduous and evergreen.</li> <li>To know a variety of deciduous (birch, oak, maple) and evergreen trees (conifers, fir, pine).</li> <li>To know the following parts of deciduous and evergreen trees: roots, trunk, branches, leaves.</li> <li>To know a variety of common flowering plants (rose, daffodil, peony, marigold).</li> <li>To know the basic structure of a variety of common flowering plants, including trees: roots, stem, leaves, flower</li> <li>To know the following parts of plants: leaves, flowers (blossom), petals, fruit, roots, bulb, seed, stem.</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know how to identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>To know how to identify and name a variety of common animals that are carnivores, herbivores and omnivores.</li> <li>To know how to describe and compare the structure of a variety of common animals</li> <li>To know how to identify, name, draw and label basic parts of the human body and say which part of the body is associated with each sense.</li> </ul> |  |
|   | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>Wood, plastic, glass, metal, water, rock, physical, compare, group, shiny, stretchy, rough</li> </ul>  | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>Wild, garden, deciduous, evergreen, flowering, habitat, leaves, petals, fruit, root, bulb, seed, trunk, branches, stem</li> </ul>  | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves</li> <li>Names of animals (dog, cat, bird, horse, sheep, cow, pig, rabbit, bumblebee, mice, spider, goat, duck)</li> <li>Parts of the human body including those within the school's RSE policy</li> <li>Senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue</li> </ul>   |  |
| <b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b> | <p>asking simple questions and recognising that they can be answered in different way</p> <p>Transparency</p>  | <p>observing closely, using simple equipment</p> <p>Plant Structures</p>   | <p>using their observations and ideas to suggest answers to questions</p> <p>Body Parts</p>   |  |
| <b>Science Capital</b>                                  | <p>A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a></p> <p>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a></p> <p>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a></p> <p>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a></p> |  |   |  |

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| Year 2 | <b>Materials</b> | <b>Animals Including Humans</b> | <b>Living Things and Their Habitats</b> | <b>Plants</b> | <b>On-site learning:</b><br>Skype a scientist – linked to different |
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|  | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular use.</li> <li>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults</li> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Explore and compare the differences between things that are living, dead, and things that have never been alive.</li> <li>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.</li> <li>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</li> <li>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.</li> </ul>  | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Observe and describe how seeds and bulbs grow into mature plants.</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul>   | <p>topics:<br/>Faelan Mourmourakis</p> <p>British Science week.</p> <p><b>Potential off-site learning:</b><br/>Washington Wetland Centre<br/>Stewarts park.</p> <p><b>Famous Scientists to study</b><br/>Garrett Morgan<br/>Dr Eugenie Clark<br/>Leo Baekeland<br/>Rachel Carson<br/>Marie Clark Taylor<br/>Dr Kelly Blacklock</p> |
|  | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know that all objects are made of one or more materials that are chosen specifically because they have suitable properties for the task e.g. a water bottle is made of plastic because it is transparent allowing you to see the drink inside and waterproof so that it holds the water.</li> <li>To know that</li> </ul>       | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know how to name animals and their offspring (dog/puppy, cat/kitten, bird/fledglings, sheep/lamb, cow/calf, horse/foals).</li> <li>To know that in humans and some animals, these offspring will be young, such as babies or kittens, that grow into adults. In other animals, such as chickens or insects</li> </ul>                         | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know that all objects are either living, dead or have never been alive.</li> <li>To know that living things are plants (including seeds) and animals. Dead things include dead animals and plants and parts of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair and feathers.</li> <li>To know that an object made of wood is classed as dead and objects made of rock, metal and plastic have never been alive (again ignoring that plastics are made of fossil fuels).</li> <li>To know that animals and plants live in a habitat to which they are suited, which means that animals have suitable features that help them move and find food and plants have suitable features that help them to grow well. The habitat provides the basic needs of the animals and plants shelter, food and water.</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>To know that plants may grow from either seeds or bulbs. These then germinate and grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc.</li> <li>To know that seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates.</li> <li>To know that some plants are better suited to growing in full sun and some grow better in partial or full shade.</li> <li>To know that plants also need different amounts of water and space to grow well and stay healthy.</li> </ul> |  |

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|  | <p>when choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities.</p> <ul style="list-style-type: none"> <li>• To know that a material can be suitable for different purposes and an object can be made from different materials.</li> <li>• To know that objects made of some materials can be changed in shape by bending, stretching, squashing and twisting e.g. clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a property of the material or depend on how the material has been processed e.g. thickness</li> </ul> | <p>(spiders, flies, wasps), there may be eggs laid that hatch to young or other stages, which then grow into adults.</p> <ul style="list-style-type: none"> <li>• To know that the young of some animals do not look like their parents e.g. tadpoles</li> <li>• To know that all animals, including humans, have the basic needs of feeding, drinking, and breathing that must be satisfied in order to survive.</li> <li>• To know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods</li> <li>• To know that more than half of our diet should be made up of carbohydrates, fruit and vegetables and that fats and sugary foods should be eaten rarely and in small amounts</li> <li>• To know that people need to exercise often to help their body</li> </ul> | <p>To know that:</p> <ul style="list-style-type: none"> <li>• Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter, on the bark of trees, on the leaves.</li> <li>• These micro- habitats have different conditions e.g. light or dark, damp or dry.</li> <li>• These conditions affect which plants and animals live there.</li> <li>• The plants and animals in a habitat depend on each other for food and shelter etc.</li> <li>• To know that the way that animals obtain their food from plants and other animals can be shown in a food chain.</li> </ul> |  |  |
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|   |   | stay strong and fit and that keeping clean, including washing and brushing teeth, is an important part of staying healthy.   |  |  |  |
|   | <u>Substantive Vocabulary</u> – <ul style="list-style-type: none"> <li>Identify, compare, wood, plastic, metal, glass, brick, rock, paper, cardboard, solid, squashing, bending, twisting, stretching</li> </ul>  | <u>Substantive Vocabulary</u> – <ul style="list-style-type: none"> <li>Offspring, adults, hatch, grow, survival, water, food, air, exercise, eating healthy, hygiene, growth</li> <li>Names of animals and their babies (dog/puppy, cat/kitten, bird/fledglings, sheep/lamb, cow/calf, horse/foals), heartbeat.</li> </ul> | <u>Substantive Vocabulary</u> – <ul style="list-style-type: none"> <li>living, dead, never been alive, habitats, suited, micro-habitats, food chain</li> </ul> | <u>Substantive Vocabulary</u> – <ul style="list-style-type: none"> <li>Seed, bulbs, plants, water, light, temperature, grow, healthy, germination, reproduction</li> </ul> |  |
| <b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b> | gathering and recording data to help in answering questions<br><br>Materials Hunt   | using their observations and ideas to suggest answers to questions<br><br>Hand Spans   | performing simple tests<br><br>Rocket Mice   | identifying and classifying<br><br>Nature Spotters   |  |
| <b>Science Capital</b>                                  | A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a><br>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a><br>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a><br>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a> |  |  |  |  |

| Year 3 | Animals including Humans  | Plants   | Rocks   | Forces and Magnets  | Light  | On-site learning:  |
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|        | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>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</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement.</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>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</li> <li>Investigate the way in which water is transported within plants</li> <li>Explore the part that flowers play in the life cycle of flowering plants including pollination, seed formation and seed dispersal.</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> <li>Recognise that soils are made from rocks and organic matter.</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>Observe how magnets attract or repel each other and attract some materials and not others</li> <li>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</li> <li>Describe magnets as having two poles</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> | <p><u>National Curriculum Objectives</u></p> <ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light</li> <li>Notice that light is reflected from surfaces</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>Find patterns in the way that the size of shadows change.</li> </ul> | <p>Skype a scientist – linked to different topics:<br/>Faelan Mourmourakis</p> <p>British Science week.<br/>Fuji film engineering to visit and hold workshop</p> <p><b>Potential off-site learning:</b><br/>Washington Wetland Centre<br/>Stewarts park.</p> <p><b>Famous Scientists to study:</b><br/>CV Raman<br/>Carl Linnaeus<br/>Mary Anning<br/>George Washington<br/>Isaac Newton</p> |

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|  | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>• To know that animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.</li> <li>• To know that 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.</li> <li>• To know that humans, and some other animals, have skeletons and muscles which help them move and provide protection and support.</li> <li>• To know that human skeletons are made up of bones.</li> <li>• To know that muscles can only contract, so they must be arranged in pairs in the body so that as one contracts the other loosens.</li> <li>• To know that animals get nutrients from food.</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>• Know the function of the following parts of flowering plants: roots, stem/trunk, leaves, flowers.</li> <li>• To know that the roots collect water and minerals from the soil, and hold the plant firmly in the ground</li> <li>• To know that the stem holds up the leaves so that they can gather light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; know that the stem also transports water and minerals from the roots to the other parts of the plant</li> <li>• To know that the leaves make food by trapping light and using its energy to turn carbon dioxide and water into carbohydrates</li> <li>• To know that the function of a flower is reproduction, where flowers of the same kind</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>• To know that rock is a naturally occurring material.</li> <li>• To know that there are different types of rock e.g. sandstone, limestone, slate etc. which have different properties.</li> </ul> <p>To know that:</p> <ul style="list-style-type: none"> <li>• Rocks can be hard or soft.</li> <li>• They have different sizes of grain or crystal.</li> <li>• They may absorb water.</li> <li>• Rocks can be different shapes and sizes (stones, pebbles, boulders).</li> <li>• To know that soils are made up of pieces of ground down rock which may be mixed with plant and animal material (organic matter).</li> <li>• To know that the type of rock, size of rock pieces and the</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>• To know that a force is a push or a pull.</li> <li>• To know that 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.</li> <li>• To know that a magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic.</li> <li>• To know that the strongest parts of a magnet are the poles.</li> <li>• To know that magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought</li> </ul> | <p><u>Substantive Knowledge</u></p> <ul style="list-style-type: none"> <li>• We see objects because our eyes can sense light.</li> <li>• Dark is the absence of light.</li> <li>• We cannot see anything in complete darkness.</li> <li>• Some objects, for example, the sun, light bulbs and candles are sources of light.</li> <li>• Objects are easier to see if there is more light.</li> <li>• Some surfaces reflect light.</li> <li>• Objects are easier to see when there is less light if they are reflective.</li> <li>• 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.</li> <li>• Shadows are formed on a surface when an opaque or translucent</li> </ul> |  |
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|  |   | <p>exchange pollen – made by an anther – in a process called fertilisation, and a structure in the flower’s ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal</p> <ul style="list-style-type: none"> <li>To know that different plants require different conditions for germination and growth.</li> </ul> | <p>amount of organic matter affect the property of the soil.</p> <ul style="list-style-type: none"> <li>To know that some rocks contain fossils.</li> <li>To know that 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.</li> <li>To know that over time the dissolving animal and plant matter is replaced by minerals from the water.</li> </ul> | <p>together they will push away from each other – repel.</p> <ul style="list-style-type: none"> <li>To know that if two unlike poles, e.g. a north and south, are brought together they will pull together attract.</li> <li>For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees.</li> <li>Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.</li> </ul> | <p>object is between a light source and the surface and blocks some of the light.</p> <ul style="list-style-type: none"> <li>The size of the shadow depends on the position of the source, object and surface.</li> </ul> |  |
|  | <p>Substantive Vocabulary – nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine</p> | <p>Substantive Vocabulary – air, light, water, photosynthesis nutrients, soil, reproduction, transportation, dispersal, pollination, flower, germination, stigma, ovary</p>  | <p>Substantive Vocabulary – fossils, soils, sandstone, granite, marble, pumice, crystals, absorbent, sedimentary, igneous, metamorphic</p>   | <p>Substantive Vocabulary - magnetic, force, contact, attract, repel, friction, poles, push, pull</p>   | <p>Substantive Vocabulary – light, Shadows, Source, Dark, reflective, reflection, opaque, translucent, transparent</p>  |  |
| <p><b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b></p> | <p>asking relevant questions and using different types of scientific enquiries to answer them</p>   | <p>gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p>   | <p>using straightforward scientific evidence to answer questions or to support their findings.</p>   | <p>setting up simple practical enquiries, comparative and fair tests</p>  | <p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>  |  |

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|                        | Skeletons  | Function of a Plant Stem | Rock Reports | Magnet tests | Making Shadows |  |
| <b>Science Capital</b> | <p>A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a><br/> Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a><br/> Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a><br/> The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a></p> |                          |              |              |                |  |

| <b>Year 4</b> | <b>States of Matter</b>   | <b>Sound</b>   | <b>Electricity</b>   | <b>Animals Including Humans</b>  | <b>Living Things and Their Habitats</b>   | <b>On-site learning:</b>  |
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|               | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Compare and group materials together, according to whether they are solids, liquids or gases</li> <li>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)</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Identify how sounds are made, associating some of them with something vibrating</li> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Identify common appliances that run on electricity</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>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</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things.</li> </ul> | <p><b>Potential off-site learning:</b><br/> Potential trip to the life centre.<br/> Stewarts park.</p> <p><b>Famous Scientists to study:</b><br/> CV Raman<br/> Carl Linnaeus<br/> Jill Robinson<br/> Marie Curie<br/> Jacques Cousteau</p> |

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|  |  | the sound source increases.   |   |  |   |  |
|  | <u>Substantive Knowledge</u> <ul style="list-style-type: none"> <li>To know that a solid keeps its shape and has a fixed volume.</li> <li>To know that a liquid has a fixed volume but changes in shape to fit the container.</li> <li>To know that a liquid can be poured and keeps a level, horizontal surface.</li> <li>To know that a gas fills all available space; it has no fixed shape or volume.</li> <li>To know that granular and powdery solids like sand can be confused with liquids because they can be poured, but when poured they form a heap and they do not keep a level surface when tipped.</li> <li>To know that each individual grain demonstrates the properties of a solid. Melting is a state change</li> </ul> | <u>Substantive Knowledge</u> <ul style="list-style-type: none"> <li>To know that sound produces vibrations which travel through a medium from the source to our ears.</li> <li>To know that different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter).</li> <li>To know that the vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</li> <li>To know that the loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source.</li> </ul> | <u>Substantive Knowledge</u> <ul style="list-style-type: none"> <li>To know that many household devices and appliances run on electricity.</li> <li>To know that some plug in to the mains and others run on batteries.</li> <li>To know how to use recognised circuit symbols.</li> <li>To know that an electrical circuit consists of a cell or battery connected to a component using wires.</li> <li>To know that if there is a break in the circuit, a loose connection or a short circuit, the component will not work.</li> <li>To know that when electrical current flows through a circuit, component within that circuit – such as buzzers which make a noise and bulbs which emit light – begin to work</li> <li>To know that a switch can be added to the circuit to turn the component on and off.</li> <li>To know that metals are good conductors so they can be used as wires in a circuit.</li> <li>To know that non- metallic solids are insulators except for graphite (pencil lead).</li> <li>To know that water, if not completely pure, also conducts electricity.</li> </ul> | <u>Substantive Knowledge</u> <ul style="list-style-type: none"> <li>To know to locate the main organs of the human digestive system.</li> </ul> <p>To know the following terms to describe how the digestive system works:</p> <ul style="list-style-type: none"> <li>Food enters the body through the mouth.</li> <li>Digestion starts when the teeth start to break the food down.</li> <li>Saliva is added and the tongue rolls the food into a ball.</li> <li>The food is swallowed and passes down the esophagus to the stomach.</li> <li>Here the food is broken down further by being churned around and other chemicals are added.</li> <li>The food passes into the small intestine.</li> <li>Here nutrients are removed from the food and leave the digestive system to be used elsewhere</li> </ul> | <u>Substantive Knowledge</u> <ul style="list-style-type: none"> <li>To know that animals can be grouped (classified) based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behavior (e.g. herbivores, carnivores and omnivores)</li> <li>To know that a species is a group of living things have many similarities that can reproduce together produce offspring</li> <li>To know that a classification key uses questions to sort and identify different living things</li> <li>To know how to use a classification key to identify living things</li> <li>To know how to create a classification key to sort plants on the school premises</li> <li>To know that</li> </ul> |  |

from solid to liquid. Freezing is a state change from liquid to solid.

- To know that the freezing point of water is 0oC.
- To know that boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid.
- To know that water boils when it is heated to 100oC.
- To know that evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower temperatures and only at the surface of the liquid.
- To know that evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy.
- To know that condensation is the change back from a gas to a

- To know that a sound insulator is a material which blocks sound effectively.
- To know that pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.

in the body.

- The rest of the food then passes into the large intestine.
- Here the water is removed for use elsewhere in the body.
- What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.
- To know that humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing).
- To know how to explain how we can look after our teeth.
- To know that living things can be classified as producers, predators and prey according to their place in the food chain.

changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species dies

- To know that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existence
- To know that the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce

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|  | <p>liquid caused by cooling.</p> <ul style="list-style-type: none"> <li>To know that water at the surface of seas, rivers etc. evaporates into water vapor (a gas). This rises, cools and condenses back into a liquid forming clouds.</li> <li>To know that when too much water has condensed, the water droplets in the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is known as precipitation. This is the water cycle.</li> </ul> |   |  |  |  |  |
|  | <p><u>Substantive Vocabulary</u> – solid, liquid, gas, evaporation, condensation, particles, temperature, freezing, heating, water cycle</p>   | <p><u>Substantive Vocabulary</u> – sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud</p> | <p><u>Substantive Vocabulary</u> – cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators, amps, volts, cell, positive, negative, loose connection, crocodile clip</p> | <p><u>Vocabulary</u> - nutrition, digestion, esophagus, stomach, saliva, large and small intestine, bowel, food chain, predator, prey, producer, consume</p> | <p><u>Vocabulary</u> - vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, environment, habitats, classify, key</p> |  |
| <p><b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b></p> | <p>setting up simple practical enquiries, comparative and fair tests</p>   | <p>identifying differences, similarities or changes related to simple scientific ideas and processes</p>                        | <p>reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</p>   | <p>using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</p>                           | <p>Gather, record and classify data</p>  |  |



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|                        | Drying  | String Phones | Does it conduct electricity? | Teeth in liquid | Local environment survey |  |
| <b>Science Capital</b> | A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a><br>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a><br>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a><br>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a> |               |                              |                 |                          |  |

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| <b>Year 5</b> | <b>Properties and changes of materials</b>   | <b>Earth and Space</b>  | <b>Animals including Humans</b>  | <b>Forces</b>  | <b>Living things and their habitats</b>  | <b>On-site learning</b>  |
|               | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>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</li> <li>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>Use knowledge of solids, liquids</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>Describe the movement of the Moon relative to the Earth</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> <li>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater</li> </ul> | <u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> <li>Describe the life process of reproduction in some plants and animals.</li> </ul> | Skype a scientist – linked to different topics:<br>Karen Adler<br>CCI – Virtual visit to the science industry.<br>British Science week.<br><br><b>Off-site learning</b><br>Stewarts park.<br><br><b>Famous Scientists to study</b><br>Galileo Galilei<br>Sir Issaa Newton<br>Dr Stephen Hawkins<br>Mae Jameson<br>David Attenborough |

and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

- Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.

effect.

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|  | <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>To know that materials have different uses depending on their properties and state (liquid, solid, gas).</li> <li>To know that properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.</li> <li>To know that some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.</li> <li>To know that mixtures can be separated by filtering, sieving and evaporation.</li> <li>To know that some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials</li> </ul> | <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>To know that the Sun is a star.</li> <li>To know that it is at the center of our solar system.</li> <li>To know that there are 8 planets (can choose to name them, but not essential).</li> <li>To know that these travel around the Sun in fixed orbits.</li> <li>To know that the Earth takes 365¼ days to complete its orbit around the Sun.</li> <li>To know that the Earth rotates (spins) on its axis every 24 hours.</li> <li>To know that as Earth rotates half faces the Sun (day) and half is facing away from the Sun (night).</li> <li>To know that as the Earth rotates, the Sun appears to move across the sky.</li> <li>To know that the Moon orbits the Earth.</li> <li>To know that it takes about 28 days to complete its</li> </ul> | <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>To know that when babies are young, they grow rapidly.</li> <li>To know that they are very dependent on their parents.</li> <li>To know that as they develop, they learn many skills.</li> <li>To know that at puberty, a child's body changes and develops primary and secondary sexual characteristics.</li> <li>To know that this enables the adult to reproduce.</li> </ul> | <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>To know that a force causes an object to start moving, stop moving, speed up, slow down or change direction.</li> <li>To know that gravity is a force that acts at a distance.</li> <li>To know that everything is pulled to the Earth by gravity. This causes unsupported objects to fall.</li> <li>To know that resistance, water resistance and friction are contact forces that act between moving surfaces.</li> <li>To know that the object may be moving through the air or water, or the air and water may be moving over a stationary object.</li> <li>To know that a mechanism is a device that allows a small force to be increased to a larger force.</li> <li>To know that</li> </ul> | <p><u>Substantive Vocabulary</u></p> <ul style="list-style-type: none"> <li>To know that as part of their life cycle, plants and animals reproduce.</li> <li>To know that most animals reproduce sexually.</li> <li>To know that this involves two parents where the sperm from the male fertilises the female egg. Animals, including humans, have offspring which grow into adults.</li> <li>To know that in humans and some animals, these offspring will be born live, such as babies or kittens, and then grow into adults.</li> <li>To know that in other animals, such as chickens or snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo a further change before becoming adults e.g. caterpillars to butterflies. This is called a metamorphosis.</li> <li>To know that plants reproduce both sexually and asexually.</li> <li>To know that bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent.</li> <li>To know that gardeners may force plants to reproduce asexually by taking cuttings.</li> <li>To know that sexual reproduction occurs through pollination, usually involving wind or insects.</li> </ul> |  |
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|   | and these are not reversible.   | <ul style="list-style-type: none"> <li>orbit.</li> <li>To know that the Sun, Earth and Moon are approximately spherical.</li> </ul>  |  | <p>the pay back is that it requires a greater movement.</p> <ul style="list-style-type: none"> <li>To know that the small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover.</li> <li>To know that pulleys, levers and gears are all mechanisms, also known as simple machines.</li> </ul> |   |  |
|   | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>hardness, solubility, transparency, conductivity, magnetic, filter, sieve, evaporation, dissolving, mixing, solution, solute</li> </ul> | <p><u>Substantive Vocabulary</u> -</p> <ul style="list-style-type: none"> <li>Earth, sun, moon, axis, rotation, day, night, phases of the moon, star, constellation, planet</li> </ul> | <p><u>Substantive Vocabulary</u> -</p> <ul style="list-style-type: none"> <li>fetus, embryo, womb, gestation, baby, toddler, adolescent, adult, elderly, growth, development, puberty</li> </ul>   | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>air resistance, water resistance, friction, gravity, Newton, gears, pulleys</li> </ul>  | <p><u>Substantive Vocabulary</u> –</p> <ul style="list-style-type: none"> <li>life cycle, mammal, reproduction, insect, amphibian, bird, offspring</li> </ul>           |  |
| <b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b> | <p>planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary</p> <p>Dissolving</p>  | <p>recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</p> <p>Space Craters</p> | <p>Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations</p> <p>Life Cycles</p> | <p>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Spinners</p>  | <p>taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</p> <p>Growth Survey</p> |  |

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| <b>Science Capital</b> | A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a><br>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a><br>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a><br>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a> |  |  |   |   |  |
| <b>Year 6</b>          | <b>Light</b><br><br><u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines</li> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</li> <li>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</li> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>  | <b>Electricity</b><br><br><u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</li> <li>Use recognised symbols when representing a simple circuit in a diagram.</li> </ul> | <b>Living Things and Their Habitats</b><br><br><u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>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</li> <li>Give reasons for classifying plants and animals based on specific characteristics.</li> </ul> | <b>Animals Including Humans</b><br><br><u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> | <b>Evolution and Inheritance</b><br><br><u>National Curriculum Objectives</u> <ul style="list-style-type: none"> <li>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may</li> </ul> | <b>On-site learning:</b><br>Skype a scientist – linked to different topics:<br>Karen Adler<br>CCI – Virtual visit to the science industry.<br>British Science week.<br><br><b>Potential off-site learning:</b><br>Secondary school visit.<br>Stewarts park.<br><br><b>Visitors</b><br>Famous Scientists to study<br>Charles Darwin<br>Louis Pasteur<br>Rachel Carson<br>Thomas Edison<br>Carl Linnaeus |

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|  |  |   |  |   | lead to evolution.   |  |
|  | <p><u>Substantive Knowledge-</u></p> <ul style="list-style-type: none"> <li>To know that light appears to travel in straight lines, and we see objects when light from them goes into our eyes.</li> <li>To know that light may come directly from light sources, but for other objects some light must be reflected from the object into our eyes for the object to be seen.</li> <li>To know that objects that block light (are not fully transparent) will cause shadows.</li> <li>To know that because light travels in straight lines, the shape of the shadow will be the same as the</li> </ul> | <p><u>Substantive Knowledge-</u></p> <ul style="list-style-type: none"> <li>To know that adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens.</li> <li>To know that adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.</li> <li>To know that turning a switch off (open) breaks a circuit so the circuit is not complete</li> </ul> | <p><u>Substantive Knowledge-</u></p> <ul style="list-style-type: none"> <li>To know how to construct a classification key.</li> <li>To know how living things are classified into groups based on observable characteristics, similarities, and differences, including micro-organisms, plants and animals.</li> <li>To know that plants and animals are two main groups but there are other living things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms.</li> <li>To know how to classify plants into sub-groups based on specific characteristics.</li> <li>To know how to classify animals into sub-groups based on specific characteristics.</li> <li>To know how to justify classification choices based on specific characteristics.</li> <li>To know that plants can make their own food whereas animals cannot.</li> <li>To know that vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals.</li> <li>To know that invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.</li> <li>To know that each group has common characteristics.</li> </ul> | <p><u>Substantive Knowledge-</u></p> <p>To know that:</p> <ul style="list-style-type: none"> <li>The heart pumps blood in the blood vessels around to the lungs.</li> <li>Oxygen goes into the blood and carbon dioxide is removed. The blood goes back to the heart and is then pumped around the body.</li> <li>Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed. As they are used, they produce carbon dioxide and other waste products.</li> <li>Carbon dioxide is carried by the blood back to</li> </ul> | <p><u>Substantive Knowledge-</u></p> <ul style="list-style-type: none"> <li>To know that all living things have offspring of the same kind, as features in the offspring are inherited from the parents.</li> <li>To know that due to sexual reproduction, the offspring are not identical to their parents and vary from each other.</li> <li>To know that plants and animals have characteristics that make them suited (adapted) to their environment.</li> <li>To know that if the environment changes rapidly, some variations of a species may not suit the new environment and will die.</li> </ul> |  |

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|  | <p>outline shape of the object.</p> | <p>and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.</p> <ul style="list-style-type: none"> <li>To know how to use recognised circuit symbols to draw simple circuit diagrams.</li> </ul> |  | <p>the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body.</p> <p>This is the human circulatory system.</p> <ul style="list-style-type: none"> <li>To know that diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well our heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel.</li> <li>To know that some conditions are caused by deficiencies in our diet e.g. lack of vitamins.</li> </ul> | <ul style="list-style-type: none"> <li>To know that if the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young.</li> <li>To know that over time, these inherited characteristics become more dominant within the population.</li> <li>To know that over a very long period of time, these characteristics may be so different to how they were originally that a new species is created.</li> </ul> <p>This is evolution.</p> <ul style="list-style-type: none"> <li>To know that fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution.</li> <li>More recently, scientists such as Darwin and</li> </ul> |  |
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|   |   |  |   |   | Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.   |  |
|   | <u>Substantive Vocabulary</u> – light source, light diagram reflection, periscope, filter, shadow, straight line  | <u>Substantive Vocabulary</u> – cells, wires, bulbs, switches, buzzers, battery, circuit, series, conductors, insulators, amps, volts, cell                  | <u>Substantive Vocabulary</u> – classification, vertebrates, invertebrates, micro-organisms, amphibians, reptiles, mammals, insects | <u>Substantive Vocabulary</u> – circulatory, heart, blood, vessels, veins, arteries, oxygenated, deoxygenated, value, exercise, respiration | <u>Substantive Vocabulary</u> – fossils, adaption, evolution, characteristics, reproduction, genetics   |  |
| <b>WORKING SCIENTIFICALLY FOCUS AND TAPS ASSESSMENT</b> | recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs<br><br>Investigating Shadows   | planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary<br><br>Bulb Brightness | identifying scientific evidence that has been used to support or refute ideas or arguments<br><br>Flower Sampling                   | using test results to make predictions to set up further comparative and fair tests<br><br>Heart rate Pose                                  | Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations<br><br>Invertebrate Research |  |
| <b>Science Capital</b>                                  | A scientist just like me - <a href="https://pstt.org.uk/resources/curriculum-materials/ASJLM">https://pstt.org.uk/resources/curriculum-materials/ASJLM</a><br>Phizzi professionals - <a href="https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional">https://www.ogdentrust.com/resources/?curriculum=&amp;age=&amp;series=phizzi-professional</a><br>Skype a scientist - <a href="https://www.skypeascientist.com/">https://www.skypeascientist.com/</a><br>The STEM Hub - <a href="https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles">https://thestemhub.org.uk/ambassadors-at-work/ambassador-profiles</a> |  |   |   |   |  |
| <b>Scaffold/ Support</b>                                | As the curriculum is experiential, no pupil should be assessed for science based on their ability to write scientifically. TAPs assessments and the STEM website provides ideas for each unit and how questioning can be used to support the progress of all pupils. Pupils should  |  |   |   |   |  |



be supported through their acquisition of Working Scientifically skills.

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| <b>GD</b>              | Pupils working at GD are challenged with the use of direct, effective questioning. TAPs assessments provide ideas for how to assess pupils are at this level. The STEM website provides ideas for each unit as to how pupils can be challenged both in terms of knowledge and Working Scientifically skills.   |
| <b>Science Capital</b> | “Science capital refers to science-related qualifications, understanding, knowledge (about science and ‘how it works’), interest and social contacts (e.g. knowing someone who works in a science-related job).” (ASPIRES, 2013).<br>At Ormesby Primary School, we aim to equip children with the essential skills, knowledge, qualifications and understanding that they need for future success. Within science, our initial focus will be providing pupils with an understanding of how these skills and key knowledge can help them to unlock future STEM careers. |

### British Values

| <b>Democracy</b>   | <b>The Rule of Law</b>  | <b>Individual Liberty</b>  | <b>Mutual Respect</b>  | <b>Tolerance of those of different faiths and beliefs</b>  |
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| In the Science classroom we learn through our lessons to take into consideration the views and opinions of others. We take turns and instructions from others. | In our Science lessons we learn and understand the importance of following safety rules when working scientifically.<br><br>Science lessons help children to understand the consequences of their actions, which in turn helps them to apply this understanding to their own lives. | In Science we learn to confidently share our own opinions and ideas and respect the opinions of others.<br><br>Within our lesson’s pupils are encouraged to make their own choices when planning an investigation and recognise that others may have different points of view. | When learning and investigating during Science lessons we work as a team, supporting each other and sharing ideas and opinions.<br><br>We discuss our findings and respect each other’s work - through this we offer support and advice to others. | Through lessons and discussion, we look at scientific discoveries which have come from other cultures and how religious beliefs often compete with scientific understanding.<br><br>We learn to be respectful of these beliefs and to appreciate and understand them |