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| Science | **Pedagogical Knowledge**  **Science pedagogy is based in the development of conceptual understanding, processes, skills of enquiry and developing scientific attitudes.**  There are many different ways to elicit children’s ideas including:   * Drawing * Writing * Responding to a stimulus * Concept mapping * Individual or group discussions   **Best Practice Specific Pedagogies for Science**   * Analogues and illustrations to help children visualise abstract concepts. * Demonstrations to bring concepts to life. * Models to represent ideas such as the structure of a flower * Animated models to support understanding of dynamic systems * New ideas need to be related to children’s experiences, for example talking about puddles when teaching about evaporation. | | | | |
| Y1&2  Cycle A | **Autumn**  **Childhood** | | **Spring**  **Bright Lights, Big City** | **Summer**  **School Days** | |
| Unit | Everyday Materials | Human Senses | Seasonal Changes | Plant Parts | Animal Parts |
| Local Heritage |  |  |  |  |  |
| Y1 | Distinguish between the object and the material from which it is made.  Describe the simple physical properties of a variety of everyday materials.  Perform simple tests to test the properties of the materials | Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. | **Observe objects, materials, living things and changes over time, sorting and grouping them based on their features.**  Observe changes across the four seasons.  Observe and describe weather associated with the seasons and how day length varies.  Gather and record data to help answer questions. | Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.  Identify and describe the basic structure of a variety of common flowering plants, including trees.  Use observations and ideas to suggest answers to questions. | Identify, compare, group and sort a variety of common animals, including fish, amphibians, reptiles, birds, invertebrates and mammals, based on observable features.  Identify and name a variety of common animals and group them into carnivores, omnivores and herbivores.  Follow instructions to perform simple tests and begin to talk about what they might do or what might happen.  Gather and record simple data. |
| Y2 | Know a variety of different everyday materials and name them.  Know the properties of everyday materials using scientific vocabulary.  Be able to compare everyday materials and test properties | Identify and name a variety of common animals and group them into carnivores, omnivores and herbivores  Classify and identify animals including humans. | **Observe objects, materials, living things and changes over time, sorting and grouping them based on their features and explaining their reasoning.**  Observe changes across the four seasons.  Observe and describe weather associated with the seasons and how day length varies.  Describe typical UK seasonal weather patterns.  Ask simple questions and recognise that they can be answered in different ways. | Name the parts of a plant.  Know what a plant needs to live.  Be able to observe and record the growth of a plant. | Identify and name a variety of plants and **animals** in a range of habitats and microhabitats.  Explain how animals need warmth, food and shelter to survive.  Be able to complete and interpret a simple food chain.  Follow a set of instructions to perform a range of simple tests, making simple predictions for what might happen and suggesting ways to answer their questions.  Gather and record simple data with accuracy. |
| Y3&4  Cycle A | **Autumn**  **Through The Ages** | | **Spring**  **Rocks, Relics and Rumbles** | **Summer**  **Emperors and Empires** | |
| Unit | Skeletal & Muscular Systems | | Forces and Magnets | Light & Shadows | Plant Nutrition & Reproduction |
| Local Heritage | Centre for Life, Newcastle | | John Walker - Friction Match |  |  |
| Y3 | Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food. They get nutrition from what they eat.   * Identify that humans and some animals have skeletons and muscles for support, protection and movement.   Record findings using simple scientific language, drawings, labelled diagrams, keys bar charts and tables. | | **Compare and group rocks based on their appearance, properties or uses.**  **Describe simply how fossils are formed, using words, pictures or a model.**  **Investigate soils from the local environment, making comparisons and identifying features.**  Compare how things move on different surfaces.  Notice that some forces need contact between two objects but magnetic forces can act at a distance.  Use straightforward scientific evidence to answer question or to support their findings. | Notice that light is reflected from surfaces and notice that shadows are formed when the light from a light source is blocked by an opaque object.  Explain why light from the sun can be dangerous  Find patterns in the way shadows change during the day. | Identify and explore the different parts of flowering plants and know the functions of each part. Explore the requirements of plant for life and growth.  Explore the part that flowers play in the lifecycle of flowering plants including pollination, seed formation and seed dispersal  Investigate the way in which water is transported within plants. |
| Y4 | Describe the simple functions of the basic parts of the digestive system in humans. | | **Compare and group rocks based on their appearance, properties or uses.**  **Describe simply how fossils are formed, using words, pictures or a model.**  **Investigate soils from the local environment, making comparisons and identifying features.**  Observe how magnets attract or repel each and attract some materials and not others. Describe magnets as having two poles.  Predict whether two magnets will attract or repel each other depending on which poles are facing.  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. | Recognise that light from the sun can be dangerous and that there are ways to protect your eyes.  Find patterns in the way that the size of shadows change**.** | Construct and interpret a variety of food chains.  Identify produced, predators and prey.  Gather, record, classify and present data in a variety of ways to help in answering questions. |
| Y5&6  Cycle A | **Autumn**  **Dynamic Dynasties** | | **Spring**  **Sow Grow and Farm** | **Summer**  **Groundbreaking Greeks** | |
| Unit | Forces & Mechanisms | Earth & Space | Human Reproduction & Aging | Properties and Changes of Materials | |
| Local Heritage | George Stephenson | Wynyard Planetarium & Observatory |  | ICI – Perspex  John Dorman, Dorman Long | |
| Y5 | Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.  Identify the effects of air resistance, water resistance and friction that act between moving surfaces.  Planning different types of scientific enquires to answer questions including, recognising and controlling variable where necessary. | Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky.  Describe the movement of the Earth, and other planets, relative to the Sun in the solar system describe the movement of the Moon relative to the Earth. | **Describe, using their knowledge of food chains and webs, what could happen if a habitat had a living thing removed or introduced.**  **Compare the life cycles of animals, including a mammal, an amphibian, an insect and a bird.**  **Describe the life process of reproduction in some plants and animals.**  **Group and sort plants by how they reproduce.**  **Label and draw the parts of a flower involved in sexual reproduction in plants (stamen, filament, anther, pollen, carpel, stigma, style, ovary, ovule and sepal).**  **Research and describe different farming practices in the UK and how these can have positive and negative effects on natural habitats.**  Describe the changes as humans develop to old age.  Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary. | 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.  Use knowledge of solids, liquids 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. | |
| Y6 | Identify the effects of air resistance, water resistance and friction that act between moving surfaces.  Plan different types of scientific enquires to answer questions including, recognising and controlling variable where necessary. | Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object identify the effects of air resistance, water resistance and friction, that act between moving surfaces recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | **Compare the living things in two contrasting areas of a habitat (top vs bottom of a hill, full sun vs shade, exposed location vs sheltered location or well-trodden path vs unused area).**  **Identify how animals and plants are adapted to suit their environment, such as giraffes having long necks for feeding, and that adaptations may lead to evolution.**  **Use and construct classification systems to identify animals and plants from a range of habitats.**  **Identify that living things produce offspring of the same kind, although the offspring are not identical to either parent.**  **Research unfamiliar animals and plants from a range of habitats, deciding upon and explaining where they belong in the classification system.**  Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations. | Demonstrate that dissolving, mixing and changes of state are reversible changes.  Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.  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. | |

**End points in bold are taught in the main project**