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| **Science** | | |
| **EYFS**  **Characteristics of Effective Learning:**  **Playing and Exploring/Engagement**   * Finding out and exploring * Playing with what they know * Being willing to 'have a go'   **Active Learning/Motivation**   * Being involved and concentrating * Keeping trying * Enjoying achieving what they set out to do   **Creating and Thinking Critically/Thinking**   * Having their own ideas * Making links * Choosing ways to do things | | |
| **Intent** | **Implementation** | **Impact** |
| **At Girnhill Infant School, we provide a high quality and stimulating Science curriculum by ensuring challenging and playful opportunities across the prime and specific areas of development.**  At Girnhill, teachers in the Early Years deliver science through focus sessions and the use of both the indoor and outdoor provision.  To support science teaching at Girnhill, teachers set ambitious expectations for all pupils, teach subject specific content and where appropriate make strong cross curricula links. These lessons build upon previously taught knowledge, skills and vocabulary.  **Throughout all Science lessons;**   * Children will be introduced to subject specific vocabulary that a scientist would use. * Children will use subject specific vocabulary to talk like a scientist. * Children will use subject specific vocabulary and definitions that a scientist would use. * Children will research, interpret and present information like a scientist. * Children will learn to work and talk like a scientist.   **Rationale:**  **Planning:**  Science is planned using the Early Years Foundation Stage, Development Matters and the Science progression grids. This is to ensure a considered sequence of experiences including subject specific vocabulary, knowledge, skills of making, ideas and evaluation.  **Curriculum:**   * They make observations of animals and plants and explain why some things occur and talk about change. * They know about similarities and differences to relation to materials and living things. * They will answer why and how questions about their experiences. * Understand the importance of diet and good health. * They talk about ways of keeping healthy and safe. * Know the similarities and differences of themselves and others.   **Research:**  Closing the vocabulary gap:   * Between birth and 48 months, professional parents speak 32 million more words to children than those from disadvantaged families – herein lies the vocabulary gap. * Vocabulary size at 28 months equates to linguistic and cognitive ability at age 8. * Vocabulary at 5 – 7 is a direct predictor of comprehension 10 years later.   Rosenshine’s principles in action:   * Conceptual information initially enters our working memory. Working memory is rather small and only small amounts of information can be absorbed at once. New information is only moved from working memory to long-term memory if we can connect it to knowledge that we already have (our schema). As a result of this, prior knowledge is a major factor in our capacity to learn new information therefore a specific teaching sequence needs to be implemented based upon daily, weekly and termly review. | Our Science curriculum enables children to become developing scientists through high quality provision, which includes:  **Teaching sequence:**  Planning and delivery follows Rosenshine’s Principles in action –   1. Daily review 2. Present new material in small steps 3. Ask questions 4. Provide models 5. Guide student practice 6. Check for pupils understanding 7. Obtain a high success rate 8. Provide scaffolds for different tasks 9. Independent practice 10. Weekly and monthly review   **Teaching:**  Children are taught a range of skills under the overarching principles of The Early Years Foundation Stage, Development Matters. Within this, the children will look at:  **Understanding of the World:**   * Plants. * Seasonal Changes. * Everyday Materials. * Animals, including Humans. * Living Things and their Habitats   **Physical Development:**   * Human body   This will be during a range of explicit taught sessions and through continuous provision.  Children are taught to practise, use and apply these skills independently and collaboratively throughout their learning environment.  Children will develop their subject specific vocabulary (generic and content based) through explicit teaching of vocabulary and definitions.  Children develop an understanding of key concepts and vocabulary through exposure to a range of fiction and non-fiction subject specific texts.  **Learning Environment:**  Learning environments and working walls focus on the scientific skills and subject specific Science vocabulary that the children use to support their learning and development within Science. Reach questioning enables children to be challenged and ensures teaching and learning is planned and pitched appropriately.  **Provision & Resources:**  Children have a range of scientific materials readily available to explore and investigate within their environment.  **Staff Knowledge:**  Staff have produced and developed EYFS skills continuums for scientific skills. These are evident in provision and support staff in resourcing, enhancing and providing children with necessary learning opportunities to move learning forwards.  **Assessment:**  Children are assessed against the ‘Understanding of the World’ and the Physical Development’ Early Learning Goals. Children are assessed at ‘Emerging’, ‘Expected’ or ‘Exceeding’ standard. | **Outcomes:**  Children demonstrate their understanding of key vocabulary through pupil voice evident during lesson observations and working folders. Pupil voice focuses on the ‘knowing more and remembering more’ principle. |

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| **Science** | | |
| **KS1**  **Aims:**   * To develop scientific knowledge and a conceptual understanding through the specific disciplines of biology, chemistry and physics. * To develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them. * To ensure that children are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future. | | |
| **Intent** | **Implementation** | **Impact** |
| In Key Stage One at Girnhill Infant School, children build on their knowledge of the Early Years Foundation Stage and explore the Understanding of The World through the specific disciplines of biology, chemistry and physics. Through subject specific teaching, children will understand how science has changed our lives and how it is vital to the world’s future.  At Girnhill, science is taught through the ambitious National Curriculum, which along with specific teaching, setting of high expectations and strong cross curricula links; British Value links and SMSC aims to ensure all children develop subject specific knowledge, vocabulary, skills and understanding enabling them to know more and remember more.  Working scientifically allows children to generate and answer scientific questions using scientific vocabulary and all pupils are taught knowledge, methods, processes and uses of science.  Rationale and Order:  Core knowledge is taught in a progressive way through EYFS and KS1. With many key aspects and content been revisited throughout each year, allowing pupils to retrieve knowledge they had previously learned and build on this in order to gain a deeper understanding of the topic and grapple with more complex ideas as well as make their own scientific predictions based on their existing scientific knowledge, ensuring children know more and remember more.  Planning:  Science is planned using the ambitious National Curriculum programmes of study and the science progression grid. This is to ensure a considered sequence of experiences including subject specific vocabulary, knowledge, ideas, predictions and evaluation.  Research:  Language and vocabulary are vital skills in enabling children to understand science concepts and to enable them to predict, conclude and experiment like a scientist.  Closing the vocabulary gap:   * Between birth and 48 months, professional parents speak 32 million more words to children than those from disadvantaged families – herein lies the vocabulary gap. * Vocabulary size at 28 months equates to linguistic and cognitive ability at age 8. * Vocabulary at 5 – 7 is a direct predictor of comprehension 10 years later.   Rosenshine’s principles in action:   * Conceptual information initially enters our working memory. Working memory is rather small and only small amounts of information can be absorbed at once. New information is only moved from working memory to long-term memory if we can connect it to knowledge that we already have (our schema). As a result of this, prior knowledge is a major factor in our capacity to learn new information therefore a specific teaching sequence needs to be implemented based upon daily, weekly and termly review. | Our science curriculum enables children to become a developing scientist through high quality provision, which includes:  **Teaching sequence:**  Planning and delivery follows Rosenshine’s Principles in action –   1. Daily review 2. Present new material in small steps 3. Ask questions 4. Provide models 5. Guide student practice 6. Check for pupils understanding 7. Obtain a high success rate 8. Provide scaffolds for different tasks 9. Independent practice 10. Weekly and monthly review   **Teaching:**  In Key Stage 1, children are taught a range of science skills under these areas of study. Throughout all of these areas, children have the opportunity to work scientifically.   * Plants. * Seasonal Changes. * Everyday Materials. * Animals, including Humans. * Living Things and their Habitats   This will be taught within explicit taught sessions.  A series of lessons will follow a specific teaching sequence that allows children to focus on specific scientific skills, consider the subject specific vocabulary, practice the taught skill, apply the taught skill and evaluate their learning using the subject specific vocabulary.  Children develop their subject specific vocabulary (generic and content based) through explicit teaching of vocabulary and definitions. In addition to this, children also develop their understanding of key concepts and vocabulary through exposure to a range of fiction and non-fiction subject specific texts.  **Learning Environment:**  Learning environments and working walls focus on the skills and subject specific vocabulary. Children use these to support their learning and development. Children will access learning in both whole class and small group tasks**.**  The science working wall will mirror the knowledge organiser clearly displaying subject specific vocabulary, which is clearly defined, key facts, sentence stems and diagrams to support learning and understanding.  The use of questioning enables children to be challenged and ensures teaching and learning is planned and pitched appropriately.  Fiction and non-fiction texts are available throughout the classroom provision and key texts are chosen to be a focused book of the week to build vocabulary and knowledge.  **Knowledge Organisers** :  These provide a clear guide to key vocabulary, facts and information, both to use in school and at home.    **Enrichment:**  Enrichment opportunities are carefully selected to enhance learning opportunities for children by demonstrating real life contextual understanding of science to enable children to become scientists.  **Resources:**  Children have access to a range of scientific equipment to develop and enhance their scientific skills in line with the Science progression grids. In addition to this, children have access to a wide range of subject specific texts to support key concepts and ideas.  **Assessment:**  Children are assessed by their use of the subject specific vocabulary (video footage, photographs, pupil voice and child’s use of language) evidence of the final piece of work. | **Outcomes:**  Children demonstrate their understanding of key vocabulary through pupil voice evident during lesson observations and working folders. Pupil voice focuses on the ‘knowing more and remembering more’ principle. |
| **Curriculum:** | | |
| **Working Scientifically Programme of Study – Year 1 and 2.**   |  | | --- | | * To ask simple questions and recognising that they can be answered in different ways. * To observing closely, using simple equipment. * To perform simple tests. * To identify and classify. * To use their observations and ideas to suggest answers to questions. * To gather and record data to help in answering questions.   **Working Scientifically Programme of Study – Year 3 and 4.**   * To ask relevant questions and using different types of scientific enquiries to answer them. * To set up simple practical enquiries, comparative and fair tests. * To use systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. * To gather, record, classify and present data in a variety of ways to help in answering questions. * To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. * To report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. * To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. * To identify differences, similarities or changes related to simple scientific ideas and processes * To use straightforward scientific evidence to answer questions or to support their findings. | | Children use a range of scientific equipment such as; magnifying glasses, collection tubs and weather stations to gather data and become scientists. |  |
| **Plants:**  **Year 1 Programme of Study:**   * To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. * To identify and describe the basic structure of a variety of common flowering plants, including trees.   **Year 2 Programme of Study:**   * To observe and describe how seeds and bulbs grow into mature plants. * To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.   **Year 3 Programme of Study:**   * To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. * To 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. * To investigate the way in which water is transported within plants. * To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. |  |  |
| **Animals, including Humans:**  **Year 1 Programme of Study:**   * To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals * To identify and name a variety of common animals that are carnivores, herbivores and omnivores.   **Year 2 Programme of Study:**   * To notice that animals, including humans, have offspring which grow into adults. * To find out about and describe the basic needs of animals, including humans, for survival (water, food and air). * To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.   **Year 3 Programme of Study:**   * To know 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. * To identify that humans and some other animals have skeletons and muscles for |  |  |
| **Everyday Materials:**  **Year 1 Programme of Study:**   * To distinguish between an object and the material from which it is made. * To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. * To describe the simple physical properties of a variety of everyday materials. * To compare and group together a variety of everyday materials on the basis of their simple physical properties.   **Year 2 Programme of Study:**   * To identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. * To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. |  |  |
| **Seasonal Changes:**  **Year 1 Programme of Study:**   * To observe changes across the four seasons. * To observe and describe weather associated with the seasons and how day length varies. |  |  |
| **Living Things and Their Habitats:**  **Year 2 Programme of Study:**   * To explore and compare the differences between things that are living, dead, and things that have never been alive. * To 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. * To identify and name a variety of plants and animals in their habitats, including micro-habitats. * To 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. |  |  |
| **Rocks:**  **Year 3 Programme of Study:**   * To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. * To describe in simple terms how fossils are formed when things that have lived are trapped within rock * To recognise that soils are made from rocks and organic matter. |  |  |
| **Light:**  **Year 3 Programme of Study:**   * To recognise that they need light in order to see things and that dark is the absence of light. * To notice that light is reflected from surfaces. * To recognise that light from the sun can be dangerous and that there are ways to protect their eyes. * To recognise that shadows are formed when the light from a light source is blocked by an opaque object * To find patterns in the way that the size of shadows change. |  |  |