|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Science – Working Scientifically | | | | | |
| **Observing over time**  *Also part of testing* | | EYFS | KS1 | LKS2 | UKS2 |
| **UtW ELG: The Natural World**  Explore the natural world around them, making observations and drawing pictures of animals and plants.  **PD ELG: Fine Motor Skills**  Begin to show accuracy and care when drawing. | Explore the world around them.  Make careful observations to support identification, comparison and noticing change.  Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. | Make systematic and careful observations. | Decide what observations or measurements to make over time and for how long |
| **Identifying, Classifying and Grouping** | | **UtW ELG: The Natural World**  Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. | Describe the characteristics they used to identify a living thing. |  |  |
| Sort and group objects, materials and living things, identifying own criteria for sorting. |  |  |
| Classify using simple prepared tables and sorting rings. | Record classifications e.g. using tables, Venn diagrams, Carroll diagrams. | Record classifications e.g. using tables |
| **Comparative and Fair Testing** | Asking Questions | **C+L ELG: Listening, Attention and Understanding**  Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions | Develop an ability to ask questions while exploring the world (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen).  Where appropriate, answer these questions. | Independently use a range of question stems.  Where appropriate, answer own questions.  Answer questions posed by the teacher. | Independently ask scientific questions |
| Making Predictions | Use own experiences of the world around me to suggest appropriate answers to questions. | Consider prior knowledge when asking questions. | Use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests |
| Setting Up Tests |  | Be involved in planning how to use resources provided to answer questions using different types of enquiry, recognising that there are different ways in which questions can be answered. | Identify the type of enquiry that they have chosen is needed to answer a question. | Make decisions e.g. whether they need to: take repeat readings (fair testing) |
| Given a range of resources, decide how to gather evidence to answer a question. | With given resources, gather evidence to answer a scientific question. |
| Observing and Measuring | ***UtW ELG: The Natural World***  *Explore the natural world around them, making observations and drawing pictures of animals and plants.* | *Make careful observations to support identification, comparison and noticing change.*  *Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.* | *Make systematic and careful observations.* | *Decide what observations or measurements to make over time and for how long* |
| **PD ELG: Fine Motor Skills**  Use a range of small tools, including scissors, paint brushes and cutlery. | Use practical resources provided to gather evidence to answer questions generated by myself or the teacher. | Select from a range of practical resources to gather evidence to answer questions generated by myself or the teacher. | Select from a range of practical resources to gather evidence to answer their questions. |
| Carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time. | Follow a plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. | Carry out fair tests, recognising and controlling variables |
| Begin to take measurements, initially by comparisons, then using non-standard units. | Use a range of equipment for measuring length, time, temperature and capacity.  Use standard units for measurements. | Select measuring equipment to give the most precise results e.g. ruler |
| Recording Data |  |  | Decide (sometimes) how to record and present evidence. | Decide how to record and present evidence |
| Record observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. | Record observation e.g. using photographs, videos, pictures, labelled diagrams or writing. | Record observations e.g. using annotated photographs |
| Record measurements e.g. using prepared tables, pictograms, tally charts and block graphs. | Record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which can add headings). | Record measurements e.g. using tables |
| Interpreting and Communicating Results  *Also in pattern seeking* | **ELG Speaking**  Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. | *The children recognise ‘biggest and smallest’, ‘best and worst’ etc. from their data.* | *Interpret their data to generate simple comparative statements based on their evidence.* | *Look for patterns and relationships using a suitable sample* |
|  | Present the same data in different ways (with support) in order to help with answering the question. | Present the same data in different ways in order to help with answering the question |
|  | Communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary | Communicate findings to an audience using relevant scientific language and illustrations |
| Answer questions developed with the teacher, often through a scenario.  With support, relate my experiences of the world around me to evidence e.g. observations they have made or measurements they have taken. | Answer their own and others’ questions based on observations they have made or measurements they have taken.  The answers are consistent with the evidence. | Answer their own and others’ questions based on observations they have made or measurements. |
| Evaluating |  |  |  | Evaluate, for example, the choice of method used |
| Identify any limitations that reduce the trust they have in their data |
| Draw conclusions based on evidence and current subject knowledge. | In conclusions: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. |
| Identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. | Discuss whether other evidence e.g. from other groups supports or refutes their answer |
| Use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. |  |
| Following a scientific experience, ask further questions which can be answered by extending the same enquiry | Talk about how their scientific ideas change due to new evidence that they have gathered |
| **Pattern Seeking** | | **UtW ELG: The Natural World**  Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. | Use observations and testing to compare objects, materials and living things.  The children recognise ‘biggest and smallest’, ‘best and worst’ etc. from their data. | Begin to identify naturally occurring patterns and causal relationships.  Interpret their data to generate simple comparative statements based on their evidence. | Look for patterns and relationships using a suitable sample |
| **Research using Secondary Sources** | |  | With support, relate my experiences of the world around me to evidence e.g. information they have gained from secondary sources.  Use simple secondary sources (such as identification sheets) to name living things. | Answer their own and others’ questions based information they have gained from secondary sources. The answers are consistent with the evidence.  Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. | Answer their own and others’ questions based on information they have gained from secondary sources. The answers are consistent with the evidence.  Talk about how new discoveries change scientific understanding. |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Science - Biology | | | | |
| Animals, including Humans | EYFS | KS1 | LKS2 | UKS2 |
| **ELG Managing Self**  Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. | Know how to classify a range of animals by amphibian, reptile, mammal, fish and birds  Know and classify animals by what they eat (carnivore, herbivore and omnivore)  Know how to sort by living and non living things5  Know the name of parts of the human body that can be seen  Know the basic stages in a life cycle for animals, (including humans)  Know why exercise, a balanced diet and good hygiene are important for humans | Know about the importance of a nutritious, balanced diet  Know how nutrients, water and oxygen are transported within animals and humans  Know about the skeletal and muscular system of a human  Identify and name the parts of the human digestive system  Know the functions of the organs in the human digestive system  Identify and know the different types of human teeth  Know the functions of different human teeth  Use and construct food chains to identify producers, predators and prey | Create a timeline to indicate stages of growth in humans  Identify and name the main parts of the human circulatory system  Know the function of the heart, blood vessels and blood  Know the impact of diet, exercise, drugs and lifestyle on health  Know the ways in which nutrients and water are transported in animals, including humans |
| All Living things and their habitats |  | Classify things by living, dead or never lived  Know how a specific habitat provides for the basic needs of things living there (plants and animals)  Match living things to their habitat  Name some different sources of food for animals  Know about and explain a simple food chain | Use classification keys to group, identify and name living things  Know how changes to an environment could endanger living things  Group materials based on their state of matter (solid, liquid or gas) | Know the life cycle of different living things e.g. mammal, amphibian, insect and bird  Know the differences between different life cycles  Know the process of reproduction in plants  Know the process of reproduction in animals  Classify living things into broad groups according to observable characteristics and based on similarities and differences  Know how living things have been classified  Give reasons for classifying plants and animals in a specific way |
| Plants | **ELG The Natural World**  Explore the natural world around them, making observations and drawing pictures of animals and plants. | Know and name a variety of common wild and garden plants  Know and name the petals, stem, leaves and root of a plant  Know and name the roots, trunk, branches and leaves of a tree  Know and explain how seeds and bulbs grow into plants  Know what plants need in order to grow and stay healthy (water, light & suitable temperature) | Know the function of different parts of flowing plants and trees  Know how water is transported within plants  Know the plant life cycle, especially the importance of flowers |  |
| Evolution and Inheritance |  |  |  | Know how the Earth and living things have changed over time  Know how fossils can be used to find out about the past  Know about reproduction and offspring (recognising that offspring normally vary and are not identical to their parents)  Know how animals and plants are adapted to suit their environment  Link adaptation over time to evolution  Know about evolution and can explain what it is |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Science - Chemistry | | | | |
| Materials | EYFS | KS1 | LKS2 | UKS2 |
| **ELG Creating with Materials**  Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function. | Know the name of the materials an object is made from  Know about the properties of everyday materials  Know how materials can be changed by squashing, bending, twisting and stretching  Know why a material might or might not be used for a specific job |  | Compare and group materials based on their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets  Know and explain how a material dissolves to form a solution  Know and show how to recover a substance from a solution  Know and demonstrate how some materials can be separated (e.g. through filtering, sieving and evaporating)  Know and demonstrate that some changes are reversible and some are not  Know how some changes result in the formation of a new material and that this is usually irreversible |
| Rocks |  |  | Compare and group rocks based on their appearance and physical properties, giving reasons  Know how soil is made and how fossils are formed  Know about and explain the difference between sedimentary, metamorphic and igneous rock |  |
| States of Matter | **ELG The Natural World**  Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. |  | Know the temperature at which materials change state  Know about and explore how some materials can change state  Know the part played by evaporation and condensation in the water cycle |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Science - Physics | | | | |
| Earth and Space | EYFS | KS1 | LKS2 | UKS2 |
| **ELG The Natural World**  Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. | Name the seasons and know about the type of weather in each season |  | Know about and explain the movement of the Earth and other planets relative to the Sun  Know about and explain the movement of the Moon relative to the Earth  Know and demonstrate how night and day are created  Describe the Sun, Earth and Moon (using the term spherical) |
| Forces |  |  | Know about and describe how objects move on different surfaces  Know how a simple pulley works and use to on to lift an object  Know how some forces require contact and some do not, giving examples  Know about and explain how magnets attract and repel Predict whether magnets will attract or repel and give a reason | Know what gravity is and its impact on our lives  Identify and know the effect of air and water resistance  Identify and know the effect of friction  Explain how levers, pulleys and gears allow a smaller force to have a greater effect |
| Light |  |  | Know that dark is the absence of light  Know that light is needed in order to see and is reflected from a surface  Know and demonstrate how a shadow is formed and explain how a shadow changes shape  Know about the danger of direct sunlight and describe how to keep protected | Know how light travels  Know and demonstrate how we see objects  Know why shadows have the same shape as the object that casts them  Know how simple optical instruments work e.g. periscope, telescope, binoculars, mirror, magnifying glass etc. |
| Electricity |  |  | Identify and name appliances that require electricity to function  Construct a series circuit  Identify and name the components in a series circuit (including cells, wires, bulbs, switches and buzzers)  Predict and test whether a lamp will light within a circuit  Know the function of a switch  Know the difference between a conductor and an insulator; giving examples of each | Compare and give reasons for why components work and do not work in a circuit  Draw circuit diagrams using correct symbols  Know how the number and voltage of cells in a circuit links to the brightness of a lamp or the volume of a buzzer |
| Sound |  |  | Know how sound is made, associating some of them with vibrating  Know how sound travels from a source to our ears  Know the correlation between pitch and the object producing a sound  Know the correlation between the volume of a sound and the strength of the vibrations that produced it  Know what happens to a sound as it travels away from its source |  |