|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Ways of working scientifically**  *Identified across each scientific area in the progression document* | Observing changes over time | Grouping and classifying | Carrying out comparative fair tests | Noticing patterns | Researching using secondary sources | Asking questions |
| **Design and Technology**  The design and technology process is at the heart of activities / learning cycles |  | | | | | |
| Year group | **Autumn 1** | **Autumn 2** | **Spring 1** | **Spring 2** | **Summer 1** | **Summer 2** |
| **Year 1** | **Chemistry**  **What is a scientist?**  **Learning Intention:**   * Know that a Scientist can be anyone * Understand the scientific lines of enquiry * Be able to Select appropriate scientific line of enquiry   Mini experiments weekly that introduce the 3 main ‘working scientifically’ skills | | **Chemistry**  **Everyday materials**  **Learning Intention:**   * Understand properties of materials * Understand the mechanism of an axle and wheel * Be able to combine knowledge properties of materials to suit a specific design criteria   **Mechanisms / Axels and wheels**  **Wacky Races**  **Learning Intention:**  Pose the children a variety of design criteria which enables them to use and apply their understanding of properties of materials and mechanisms.  **Content:** DT specific processes   * Wheel * Axle * Balance | | **Biology**  **Plants**  **Learning Intention:**   * To identify the basic parts of a flowering plant and a tree * To understand the **basic functions** of the flower, stem, leaves and roots * To understand the basic functions of a tree.   Parts and functions of a plant. | **Biology**  **Animals including humans**  **Learning Intention:**   * To name common animals. * To know how animals are grouped (5 categories). * To understand how you can identify animals. * To name and label the parts of the human body. * Be able to place animals into groups dependent on their characteristics. |
| **Year 2** | **Biology**  **Learning intention:**   * Understand basic needs for survival * To use understanding of healthy food and cutting skills to design and make a healthy snack.   **Animals including Humans**  **(**Offspring, needs for survival)  **Chemistry**  **Uses of every day materials**  **Learning Intention:**   * Understand why materials are selected for certain uses * Test materials to identify their suitability * Use this knowledge to create products which are absorbent or waterproof   **Charles Mackintosh**  LINKS: Art sculpture Spring 2 &  **Puppy challenge** | | **Biology**  **Learning Intention:**   * Understand the difference between a seed and a bulb * Understand what a plant needs to germinate * Understand how certain conditions can affect germination.   **Plants**  (seed and bulb, what plants need to grow) | **Food and Nutrition**  **Prior Learning:** EYFS Healthy eating and food names.  **Content:** Food hygiene  Food processes and equipment  Cutting terminology / skills | **Biology**  **Learning Intention:**   * Use their understanding of living things and their habitats to apply to a real life context * Why do we need to know more about certain animals (endangered animals, human impact)? * How can we use our knowledge to observe animals in their natural habitats   **Living things and their habitats**  (Habitats, dead or alive  Food chains)  LINKS: Geog Spring 1  **Famous Scientist**  **Jane Goodall** Biologist Study of gorillas in natural habitat. Effects of humans on this family group | |
| **Year 3** | **Chemistry**  **Rocks and Soils**  **Learning Intentions:**   * To identify the physical properties of rocks * To use this knowledge to group and compare. * To understand how fossils are formed. * To know how soil is created and the properties of different types.   (How they are formed)  LINKS: Geography Spring 1  **Mary Anning**  **John McAdam** | **Physics**  **Light**  **Learning intention:**   * To understand what light is and its importance. * To identify sources of light (man-made and natural). * To know how light moves and how it can be reflected. * To understand how the eye detects light. * Use their knowledge of light to create suitable eye wear. | **Biology**  **Plants**  **Learning Intentions:**   * To understand the functions of a flowering plant (plant, tree) * Understand how water is transported through a plant (transpiration) * Understand how the processes of pollination, seed formation and seed dispersal in flowering plants. * Understand the needs of particular plants (e.g. a cactus, volcanic plants etc.) | **Biology**  **Animals including humans** (Nutrition)  **Learning Intentions:**   * To understand that animals and humans need the right types and amounts of nutrition. * To be able to identify human and animal skeletal systems and muscular systems * To know these provide support, protection and movement.   **DT – Food and Nutrition**  **Learning Intention:**   * To use their knowledge of nutrition and seasonality to create a nutritious savoury meal.   **Famous Scientist**  **Louis Pasteur**  **Learning Intention:**   * To use their knowledge of pasteurisation and how foods are processed and manufactured to ensure they are safe for human consumption | | **Physics**  **Forces and Magnets**  **Learning Intentions:**   * Understand how things move on different surfaces and the forces acting on them. * Understand the properties of magnets * Use the knowledge of magnets and materials to identify magnetic materials.   **Pneumatics**  **Learning Intentions:**   * To use their knowledge of forces and pneumatics to create a moving figure.   **Content:**  History of Pneumatics  German physicist **Otto**  **James Watt**  Uses of Pneumatics  DT vocabulary  Tools required for a simple pneumatic |
| **Year 4** | **Physics**  **Electricity**  **Learning Intention:**   * To understand that electricity is an energy and identify everyday appliances that use it * To be able to construct simple circuits and know the electrical components **but not their symbols** * To use their knowledge of circuits and electricity to create a circuit with a switch and a light which serves a purpose   **Famous Scientist**  **Alessandro Volta**  Physicist  Discovered the battery!  **Electrical systems – simple circuits and switches**  **Learning Intention:**  Pose the children a variety of design criteria which enables them to use and apply their understanding of circuits to design and make a Christmas decoration.  **Content:**  Design criteria  Toggle switch  Reed switch  Secure connections  Handmade switches  Commercial switches  Circuit symbols | | **Chemistry**  **States of matter**  **Learning Intention:**   * To know there are three states of matter. * Use this knowledge to group materials according to their properties. * To know that water exists naturally in all 3 states. * To know how the different states play a part in the Water Cycle | **Biology**  **Living things and their habitats**  **Learning Intention:**   * Understand that vertebrates can be grouped due to their characteristics. * Use this understanding to use and create classification keys * To know that environments are changing and how this affects the wildlife.   (Basic classification, environment)  **David Attenborough** | **Physics**  **Sound**  **Learning Intentions:**   * To understand how sounds are made * Know that vibrations from sounds travel through a medium to our ear. * To understand pitch and volume how this affects sound * To understand how the volume of a sound is affected by distance.   **Marin Mersenne Robert Boyle** | **Biology**  **Animals Including Humans**  **Learning Intentions:**   * To know the basic parts and functions of the digestive system in humans. * To indentify the different types of teeth and functions in humans. * To be able to construct food chains   LINK: Yr5 Hist Autumn 1 |
| **Year 5** | **Chemistry**  **Properties and Changes of Materials**  **Learning Intention:**   * To be able to group everyday materials on the basis of their properties * To know that some materials dissolve in liquids to form a solution. * To identify the correct process for separating mixtures * Understand everyday uses of particular materials * Understand that some changes are reversible and some irreversible.   **John Dunlop** | **Physics**  **Earth and Space**  **Learning Intentions:**   * Understand the movement of the Earth in relation to the sun and the other planets. * Explain the movement of the Moon relative to the Earth * Know why the Earth’s rotation causes night and day * Explain that the Sun, Moon and Earth are spherical bodies * To recognise the theories of black holes and relativity   **Famous Scientist**  **Stephen Hawking**  **Brian Cox**  **Guion ‘Guy’ Bluford (first African American in Space)** | **Biology**  **Living Things and their Habitats**  **Learning Intentions:**   * To know the differences in the life cycles of a mammals, amphibian , insect and a bird * Describe the life process of reproduction in plants and animals | **Biology**  **Animals including humans**  **Learning Intentions:**   * Understand and describe the changes in humans as they age. | **Physics**  **Forces**  **Learning Intentions:**   * Know why unsupported objects fall towards earth because of the force of Gravity * Identify the effects of air resistance, water resistance and friction * Recognise that some mechanisms can allow a smaller force to have a greater effect.   **Mechanical systems – Pulleys and gears**  **Learning Intentions:**  Pose the children a variety of design criteria which enables them to use and apply their understanding of forces and mechanical systems to design and make a moving object.  **Content:** 6 simple machines identified by science and DT  Pulley rotations  Gear ratios  Reversing switches  Annotated diagram  Exploded diagram | |
| **Year 6** | **Biology**  **Evolution and Inheritance**  **Learning Intentions:**   * Understand that living things have changed over time (evolved). * Recognise that living things produce offspring which are similar but not identical * Identify how plants and animals are adapted to their environment.   **Charles Darwin**  **Mary Anning**  **Alfred Wallace** | **Biology**  **Animals Including Humans**  **Learning Intentions:**   * Identify and name the main parts of the human circulatory system * Describe how water and nutrients are transported through the body. * Explain the impact of diet, exercise, drugs and lifestyle on the way the body functions.   **DT – Food and Nutrition** | **Biology**  **Living Things and Their Habitats**  **Learning Intentions:**   * Describe how living things can be classified into broad groups according to common observable characteristics * Understand the characteristics particular of plants, animals and micro-organisms * Justify reasons for classifying living things.   **Carl Linnaeus** | **Physics**  **Electricity**  **Learning Outcomes:**   * To understand how the voltage of cells affects the brightness of a lamp and the volume of a buzzer. * To be able to compare and give reasons for how different electrical components function * Use recognised symbols to represent electrical circuits in a diagram. | **STEM Critical Thinking Tomato Challenge**  **Learning Intention:**  Provide the children with a real life challenge for them to demonstrate and consolidate their STEM skills. | **Physics**  **Light**  **Learning Intentions:**   * To know how light travels * To explain how light allows us to see * To explain how shadows are formed   **Thomas Edison**  **STEM Critical Thinking** |