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| --- | --- | --- | --- | --- | --- | --- |
| **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 equipmentCutting 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 aliveFood 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 PneumaticsGerman physicist **Otto****James Watt**Uses of PneumaticsDT vocabularyTools 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**PhysicistDiscovered 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 criteriaToggle switchReed switchSecure connectionsHandmade switchesCommercial switchesCircuit 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 MersenneRobert 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 DTPulley rotationsGear ratiosReversing switchesAnnotated diagramExploded 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** |