**Our Lady of Perpetual Succour Catholic Academy Science Curriculum**

**Progression of Knowledge and Skills Foundation to Year 6**

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| **EYFS- Nursery** | | | | | | | | |
| **30-50m-**  **The World** | | | * To comment and ask questions about aspects of their familiar world, such as the place where they live or the natural world. * To talk about some of the things they have observed, such as plants, animals, natural and found objects. * To talk about why thing’s happen and how things work. * To develop an understanding of growth, decay and changes over time. * To show care and concern for living things and the environment | | | | | |
| **40-60m-**  **Health and Self Care** | | | * To eat a healthy range of foodstuffs and understand a need for variety in food. * To show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health | | | | | |
| **40-60m- The World** | | | * To look closely at similarities, differences, patterns and change. | | | | | |
|  | **A1: My Body and Autumn** | | | **A2: Light and Dark** | **Sp1: Space** | **Sp1: Change in materials** | **Su1: Fruit and vegetables** | **Su2: Minibeasts and Summer** |
| **Knowledge, Vocabulary and Skills** | **30-50m-** To talk about what they observe about their appearance- hair, eyes, nose, teeth, ears  **30-50m:** To know that the weather changes and observe the changes, leaves, trees, autumn,  To observe and comment on senses walk of autumn- smell, taste, hear, see, feel  **40-60 months:** To know good hygiene: to wash my hands independently and use the toilet independently | | | **30-50m:** To comment on the change in season between autumn and winter and know that the leaves change, and the weather gets colder.  **30-50m-** To know that at night time the sky is dark. In the day it is light from the sun.  To comment and observe light we see around us, lamps, candles, light, sun, fireworks, divas  **40-60m**: to observe change: to know that when you heat bread in a toaster it changes colour and becomes crunchy. Then observe and how butter melts when spread on toast. | 30-50m: To ask questions about space and comment on wonders they have.  To talk about space using terms, planets, Earth, astronaut, rockets, satellites  To know that our planet earth spins and that is why it becomes day and night.  **40-60m**: to observe difference: smell and taste and texture fresh fruit eg, strawberries, blueberries and apples. Comment on difference with freeze dried astronaut food. | 30-50m- to observe change:  Comment on state of icing sugar (soft, sweet) before and after water is added. (wet, sticky) Observe what happens when colour is added. Observe when left to dry it becomes hard on biscuit. (Mother’s Day biscuits)  **40-60m**- To comment on how they feel before and during exercise, eg Heart beating slowly, faster, warmer. | 30-50m- To name fruit and vegetables and talk about how they grow.  To know that vegetables decay after time. Observe and comment on changes to vegetables kept in the fridge compared with being left in room temperature.  **40-60m**  To know that some food is healthy and unhealthy. Be able to sort foods into healthy and unhealthy. | **30-50m-** To talk about what happens to objects when placed in water. Make prediction which will float or sink. They go down means sinking and staying on top of water is floating  To talk about the life cycle of a butterfly, to know caterpillar, chrysalis and butterfly.  **40-60m-** To observe the difference and similarities between minibeasts- ladybird, woodlouse, fly, wasp, bee, caterpillar, butterfly, worm, spider.  To talk about their wings, legs and antennae.  To know it is important to wear hats, suncream and drink plenty of water in the summer. To observe how it is warmer and sunny and comment on changes to the environment. |
| **EYFS- Reception** | | | | | | | | |
| **40-60m-**  **Health and Self Care** | | * To eat a healthy range of foodstuffs and understand a need for variety in food. * To show some understanding that good practices with regard to exercise, eating, sleeping and hygiene can contribute to good health | | | | | | |
| **40-60m- The World** | | * To look closely at similarities, differences, patterns and change. | | | | | | |
| **ELG- Health and Self Care** | | * To know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe. | | | | | | |
| **ELG- The World** | | * To know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. | | | | | | |
|  | **A1:** | | | **A2:** | **Sp1:** | **Sp1:** | **Su1:** | **Su2:** |
| **Knowledge, Vocabulary and Skills** | **30-50m:** To know that the weather changes and observe the changes  **40-60 months:** To know good hygiene: to wash my hands independently and use the toilet independently | | | **30-50m:** To comment on the change in season between autumn and winter and know that the leaves change, and the weather gets colder.  **40-60m:** To observe similarities and differences; to be able to talk about autumn and winter and to know that the leaves change colour and fall off the trees when the season changes. To observe changes in the weather | **40-60m**: to observe change: to know that when you heat ice it melts into water. When you freeze water, it turns back into ice. | **40-60m - ELG:**  To know that diet is part of being healthy and be able to sort foods into healthy and unhealthy.  To talk about different ways we can be healthy, to know that exercise, diet and sleep are ways we can look after our body and mind.  To say one form of exercise, one food and one other (sleep, water, rest) that keeps us healthy | **ELG:**  (To talk about similarities and differences in relation to places, objects, materials and living things).  To know what a habitat is and begin to compare my own habitat with a butterfly.  To talk about the life cycle of a butterfly, to know caterpillar, chrysalis and butterfly. | **ELG:** To explore sinking and floating  To talk about which materials will sink and which will float. To discuss properties of materials.  To know how to keep safe in the sun, to know that if I do not put sun cream on, my skin will burn. To know to keep drinking water to be hydrated and to wear a hat to shade my face and protect my head from being heated by the sun directly. |
| **Year 1** | | | | | | | | |
|  | **A1: Humans**  **(Biology)** | | | **A2: Seasonal Change**  **(Physics)** | **Sp1: Animals**  **(Biology)**  **Sp1: Seasonal Change** | | **Su1: Everyday Materials**  **(Chemistry)** | **Su2: Plants**  **(Biology)** |
| **Knowledge, Vocabulary and Skills** | Know and accurately label the basic parts of the human body, knowing that humans have a head, arms, legs, fingers, toes, knees, elbows, shoulders and neck.  Know and explain the functions of the basic parts of the human body.  Know and label the basic parts of the human face - nose, mouth, eyes, ears  Know the five senses and match these with the part of the body associated with each sense. Knowing that the eyes help you to see, the ears help you to hear, the nose helps you to smell, the hands help you to touch tongue helps you to taste.  Name and simply describe the job of some of the organs inside my body. Knowing that the brain helps you to think, heart pumps blood around the body, lungs help you to breathe, stomach helps to digest food.  Work scientifically to explore using their senses to compare different textures, tastes, sounds and smells. | | | Name different types of weather – rain, snow, ice, clouds, sun  Link , observe and describe weather associated with the seasons knowing that in Spring the weather begins to get warmer, Summer there is more sunshine and the weather is hotter, Autumn the weather gets colder, Winter there is more snow and cold weather  Observe changes across the four seasons, knowing that in Spring flowers begin to bloom, leaves grow back on trees and are greener, in Summer there is more sunshine, in Autumn the leaves begin to fall from the trees, leaves turn red/orange/yellow, in Winter the trees are bare and the weather is colder.  Describe the relationship between the length of daytime and the season, knowing that day length varies for example in Summer there are more hours of daylight and the evenings are lighter, but in Winter there are less hours of daylight and the evenings are darker earlier.  Compare seasons in different parts of the world, knowing that when it is Winter in the UK, it is Summer in Australia.  Work scientifically: to gather and record data about the weather in different seasons by using a weather chart. | Name at least one example of a fish, bird, reptile, amphibian and mammal.  Use the words carnivore, herbivore and omnivore correctly, knowing that a carnivore only eats meat, a herbivore only eats plants and an omnivore eats both.  Make observations of fish, amphibians, reptiles, birds and mammals.  Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals    Identify and name a variety of common animals that are carnivores, herbivores and omnivores.  Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets), knowing that mammals have hair/fur, birds have wings and beaks, reptiles have scaly skin, amphibians live in water and on land and fish have fins and gills. Children will know that a snake is a reptile, a dog is a mammal, a parrot is a bird, a goldfish is a fish, a frog is an amphibian.  Identify and describe the habitats in which different animals live. Knowing that some animals are nocturnal which means they sleep during the day and are awake at night.  Work scientifically: to investigate how frogs change over their lifestyle. | | Name some materials in my local environment.  Describe the simple physical properties of a variety of everyday materials, knowing that some materials can be stretchy, waterproof, stiff, hard, soft, transparent.  Distinguish between an object and the material from which it is made, knowing that the material an object is made from will suit it’s purpose e.g a window is made from glass so we can see through it.  Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.    Compare and group together a variety of everyday materials on the basis of their simple physical properties. Children will know how to use a Venn diagram to sort materials.  Work scientifically: To investigate which material would be best suitable for different purposes. | Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen. - oak, holly, birch. Knowing that deciduous means that’s the tree sheds its leaves and evergreen means that is keeps its leaves all year round.  Know and simply describe the basic structure of a variety of common plants including roots, stem, leaves and flowers.  Know and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. Knowing that the roots in the soil take up water and nutrients for the flower, the stem keeps the flower upright and allows water to travel to the leaves and flower, the leaves help the plant make food for itself, the flower petals look bright so that bees will be attracted to it.  Explore the requirements of plants for life and growth (air, sunlight, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Knowing that most plants must have all of these ingredients to be able to grow. Children will know that some plants can be kept indoors.  Work scientifically: to explore what a plant needs to grow by planting their own bean. |
| **Year 2** | | | | | | | | |
|  | **A1: Healthy Living (Biology)** | | | **A2: Materials (Physics)** | **Sp1: Movement**  **(Physics)** | **Sp2: Animals including Humans (Biology)** | **Su1: Plants**  **(Biology)** | **Su2: Living things and their habitats**  **(Biology)** |
| **Knowledge, Vocabulary and Skills** | sorts and groups a selection of items according to whether they are *living, dead or have never been alive*    describes how they know that something is *alive or dead and can give reasons*  explains the word healthy and knows that it is important to be *healthy, active, heartbeat, breathing*  understands that having *good personal hygiene (keeping clean)* can help humans stay healthy- *germs, disease*  Work scientifically to explore how *diet* and *hygiene* affects the body.  Seasonal change- observational visit to *Bulwell Forest Garden for sensory activities* | | | recall from memory naming a number of objects that are made out of a particular material*. glass - marbles, windows, drinking glasses, vases*    Explain why  *Properties* of some materials are suitable for a particular use  Observe how shapes of certain solids, can be changed by either *squashing, bending twisting or stretching*  compares which is the most effective material, or not for a particular purpose and says why  investigates the different *forces (squash, bend, twist, stretch)* by  applying them to a solid that will change shape  Work scientifically to explore and test how some materials are best suited for a specific purpose- *flexible, water resistant, transparent* | describe the *forces* of *push, pull, move, stop, slow down and speed up* in my observations of real life situations.  observe and describe how things move, using simple comparisons such as *faster and slower*.  recognise and investigate *forces* like *gravity, thrust, upthrust, friction and air-resistance* that can make objects move or make them slow down.    Work scientifically  asking relevant questions in simple practical *enquiries*, to *compare* and recognise *fair tests*.    To gather, record, classify and present data to help answer questions using simple scientific language, *drawings, labelled diagrams, bar charts, tables and measurements.*      Seasonal change- how *living things move* in our school garden | name some common animals and their offspring,-*. sheep and lamb, horse and foal, dog and puppy, human and baby*  know and explain the basic needs of animals –*water, food , air* and lack of these-*hunger , thirst*  order the simple stages of a human life from birth to death-  *baby, child, teenager, adult, elderly adult*  describes how a newly born animal (other than a human) changes as it grows and ages  Seasonal change- Observe and discuss how the weather affects living things survive *– hibernation, bulb planting, keeping warm* | describes how a seed/bulb grows -*roots, a stem, leaves and flowers* having observed the growth of *a broad bean seed, a daffodil bulb*  explain the stages of plant growth –*germinate, seed/bulb, sapling, mature plant*    correctly sequence a set of pictures that show the growth of a plant    describes what a *healthy* and an *unhealthy plant* looks like      Work scientifically to observe and record data of what a plant needs to grow and to be healthy i.e. *water, light , sun, shade and a suitable temperature*    Seasonal change - learn that some *plants* are *seasonal* and only available according to the seasons | has knowledge of a *habitat* as the natural place *(environment)* providing for the basic needs *(food, water, shelter)* of the animals and plants that live there      explains what a simple *food chain* is knowing the correct order    Work scientifically  To create a suitable *habitat* for *mini beasts*    Seasonal change observations of *living things* and their *habitats* |
| **Year 3** | | | | | | | | |
|  | **A1: Humans**  **(Biology)** | | | **A2: Light**  **(Physics)** | **Sp1: Rocks**  **(Chemistry)** | **Sp1: Forces & Magnets (Physics)** | **Su1: Plants**  **(Biology)** | **Su2: Animals**  **(Biology)** |
| **Knowledge, Vocabulary and Skills** | Know and accurately label the basic parts of the human skeleton – spine, collar bone, skull, pelvis, knee-cap.  Describe how the purpose of the skeleton – support, movement & protection  Know and explain how muscles support the body to move.  Know that humans need the right type of nutrition - protein, dairy, carbohydrate, sugars & fats.  Name and describe the purpose of joints in the human body – hinge, gliders, ball & socket.  Work scientifically to explore how exercise affects the body. | | | Classify natural and man-made light sources.  Observe the effect of light on different surfaces - opaque, transparent, translucent.    Know that the light from the sun travels in straight lines and explain how to keep our bodies safe in direct sunlight.  Work scientifically to investigate materials that absorb or reflect light.  Work scientifically to investigate how the position of light can change the size of a shadow. | Know and name rocks granite, limestone, coal, fossil, slate, sandstone.  Make observations of different rocks know how they are formed.  Know that soil is a mixture of small pieces of rock, clay and organic matter.  Work scientifically to group based on the appearance into igneous, metamorphic and sedimentary.  Work scientifically to describe the properties of rocks eg. permeable/impermeable | Know that a force is a physical push or pull and a magnetic force can work at a distance.  Know which materials are affected by magnetic forces.  Describe magnets as having two poles.  Work scientifically to observe how friction holds back the movement of objects.  Work scientifically to investigate how bar magnets can attract or repel due to the magnetic field. | Describe the functions of different parts of plants: roots, stem/trunk, leaves and flowers.  Know the different stages of plant life cycles -germination, pollination, nectar, dispersal.  Work scientifically to compare the effect of light and fertiliser on plant growth.  Work scientifically to observe how water and nutrients are transported within plants. | Classify animals into vertebrates and invertebrates.  Know and describe the  structures of animal skeletons – endoskeleton, exoskeleton & hydrostatic skeleton.  Compare the diet of animals– carnivores, omnivores, herbivores.  Work scientifically to compare the structure of different animals. |
| **Year 4** | | | | | | | | |
|  | **A1:Animals and Humans**  **(Biology)** | | | **A2: States of Matter**  **(Chemistry)** | **Sp1: Electricity**  **(Physics)** | | **Su1: Sound**  **(Physics)** | **Su2: Living things and their habitats**  **(Biology)** |
| **Knowledge, Vocabulary and Skills** | Describe the simple functions of the parts of the digestive system; oesophagus, stomach, intestine, colon, anus  Identify different teeth and describe their functions; incisors, canines, molars.  Investigate what causes damage to teeth, draw simple conclusions    Construct and interpret a variety of food chains, identifying producers, predators and prey; discuss which are omnivore, herbivore, carnivore. | | | Classify and describe the properties of solids, liquids and gases, know how their particles are arranged  Observe that materials can change state when heated or cooled  Set up a simple practical enquiry, ensuring it is a fair test  Define the terms evaporation and condensation and explain how these processes feature in the water cycle | Construct a simple series electrical circuit, identifying and naming its basic parts; cells, wires, bulbs, switches and buzzers  Identify and explain whether a bulb will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery  Investigate some common conductors and insulators, and associate metals with being good conductors. Record these findings using tables.  Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. | | Identify how all sounds are made by a vibration. Hitting, plucking, blowing  Recognise that vibrations from sounds travel through a medium to the ear.  Define the term pitch, knowing this is different to volume.  Investigate how pitch can be changed through tightening and lengthening, recording findings using labelled diagrams.  Recognise that sounds get fainter as the distance from the sound source increases  Find patterns between the volume of a sound and the strength of the vibrations that produced it. | Recognise that living things can be grouped in a variety of ways. Fish, amphibians, reptiles, birds and mammals. Flowering, non-flowering.  Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.  Recognise that environments can change and that this can sometimes pose dangers to living things. Deforestation, litter, earthquake, flood. |
| **Year 5** | | | | | | | | |
|  | **A1: Space and the Universe** | | | **A2: Forces** | **Sp1/2: Living things and their habitats** | | **Su1: Animals and Humans** | **Su2: Properties and changing materials** |
| **Knowledge, Vocabulary and Skills** | Explain the movement of the (spherical) Earth, and other planets, relative to the Sun in the solar system, knowing that the earth orbits the sun once, every 365 days.  Describe the movement of the Moon relative to the Earth, knowing that moon orbits the earth once every 28 days.  Use knowledge of the Earth’s rotation  to explain day and night and the apparent movement of the sun across  the sky. Children will know that only half of the world experiences sunlight at any one time. | | | Comprehend that some forces slow things down, knowing that air resistance slows objects down in the air and water resistance slows objects down in the water.  Recognise 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, knowing that forces are always acting around them.  Apprehend that some mechanisms, including levers, pulleys and gears, allow a smaller  force to have a greater effect. | Identify and name a variety of  common animals that are birds, fish, amphibians, reptiles, mammals and  Invertebrates, knowing the differences between each group.  Discover and label a variety of common animals that are carnivores (meat eaters), herbivores (plant eaters) and omnivores (meat and plant eaters).  Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird, knowing that all of these begin with an egg and develop into different stages.  Describe the life process of sexual reproduction in flowering plants which start with a seed and asexual reproduction of non-flowering plants which start with spores. | | Compare differences in human beings knowing that at each of us have our own personal DNA.  Recognise changes as humans develop from babies to old age, knowing that at each stage of life their bodies change I.e. puberty.  Name the reproductive organs, knowing the biological differences between male and female.  Understand that the reproductive  process begins with cells, knowing that all living things are made from cells.  Refer to ‘living things and their habitats’ and compare the differences between reproduction in plants with reproduction in animals. | Use technical vocabulary to describe the properties of materials (hard/soft,  stiff/flexible, conductor/insulator,  transparent/opaque, hard/soft) and sort materials by their properties.  Explain why certain materials are  suitable for certain jobs. Children will decide which material would be best for an astronaut in space.  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.  Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Children will know how to separate salt and sugar from water, after it has dissolved and experiment this using our classroom.  Apply knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. |
| **Year 6** | | | | | | | | |
|  | **A1: Light and Vision**  **(Biology)** | | | **A2: Electricity**  **(Physics)** | **Sp1 Living things and their habitats**  **(Biology)** | **Sp2:Animals including humans**  **(Biology)** | **Su1: Evolution and Inheritance**  **(Biology)** | **Su2: Reversible and Irreversible Changes**  **(Chemistry)** |
| **Knowledge, Vocabulary and Skills** | Know and explain that light travel in straight lines.  Know that we see things when light reflecting off them enters our eyes.  Name parts of the eye (cornea, retina, lens, optic nerve) and explain the function each.  Explain how light travels from a light source.  understand and Investigate how prisms bend light rays.  Investigate and explain the dispersion of light.  Choose appropriate equipment to make measurements and carry out investigations. | | | Know what circuit symbols represent and  Use circuit symbols to represent a circuit and its components.  Identify and fix faults in a series circuit which would prevent it from working.  Know that the brightness of a bulb is dependent on the voltage and number of batteries. Plan a test to prove this.  Compare and give reasons for variations in how components function, including the brightness of  bulbs, the loudness of buzzers and the on/off position of switches  Design and build a parallel circuit, explaining how the bulbs light and how the electricity flows | To classify animals into groups – mammals, reptiles, birds, fish and amphibians – and describe the characteristics of each.  Describe where different plants and animals can be found.  Describe how plants, animals and micro organisms have common observable characteristics.  To draw and interpret food chains. Showing understanding of the links | To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels, veins capilleries and blood.  To plan and carry out an investigation on exercise and heart rate using dependent, independent and control variables.  To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. DARE takes place in this half term.  To make and test predictions about respiration rates.  To interpret the results to my investigations to draw conclusions. | To recognise and explain changes that living things have undergone over time and that fossils provide information about living things that inhabited the Earth millions of years ago  To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.    To describe the reproduction of a plant using the correct terms for parts – stamen, stigma, ovule, ovary, anther, pollen.  To describe and understand the process of seed dispersal and germination of plants.  To understand human reproduction. | To compare and group materials together, according to whether they are solids, liquids or gases and describe the properties of each.  To observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C).  To formulate a hypothesis based on my learning about melting and freezing.  To plan and carry out an investigation to test my hypothesis using variables.  To demonstrate and prove that dissolving, mixing and changes of state are reversible changes.  To 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 |