



St Joseph's Catholic Primary School

Science Medium Term Plan Overview

YEAR 4 LIVING THINGS AND THEIR HABITATS

Knowledge & understanding statutory requirements:

4a1: recognise that living things can be grouped in a variety of ways

4a2: explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment

4a3: recognise that environments can change and that this can sometimes pose dangers to living things.

Pupils should use the local environment throughout the year to raise and answer questions that help them to identify and study plants and animals in their habitat. They should identify how the habitat changes throughout the year. Pupils should explore possible ways of grouping a wide selection of living things that include animals and flowering plants and non-flowering plants. Pupils could begin to put vertebrate animals into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects.

Note: Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses.

Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.

Pupils might work scientifically by: using and making simple guides or keys to explore and identify local plants and animals; making a guide to local living things; raising and answering questions based on their observations of animals and what they have found out about other animals that they have researched.

Lower KS2 - Working Scientifically

ks2w1: asking relevant questions and using different types of scientific enquiries to answer them

lks2w2: setting up simple practical enquiries, comparative and fair tests

lks2w3: making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

lks2w4: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

lks2w5: recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

lks2w6: reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions



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lks2w7: using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

lks2w8: identifying differences, similarities or changes related to simple scientific ideas and processes

lks2w9: using straightforward scientific evidence to answer questions or to support their findings.

Statutory Requirements

Lessons/ LOs:

1. To group organisms in different ways.
2. To group animals according to whether they are fish, amphibians, reptiles, birds or mammals – explain what they have in common in terms of body features, behaviour, life cycles etc.
3. To identify if an animal is a vertebrate or invertebrate.
4. To use a classification key to identify familiar organisms
5. To use a classification key to identify invertebrates.
6. To create a classification key for a group of organisms from the local environment – repeatedly ask dichotomous questions.
7. Investigate how a habitat changes throughout the year. E.G Draw and label a picture of how it appears now and describe and measure the weather, temperature and hours of daylight. Predict what it will look like in 6 months time and identify any changes that might take place. If possible, revisit the site to investigate these changes.
8. To explain the reasons for deforestation and its negative effects

Vocabulary

Tetrapods, herbivores, mammals, flowering plants, vertebrates, oviparous, viviparous, animal, aquatic animals, reptiles, scales, gills, vertebrate, invertebrate, branching key, organism, deforestation

YEAR 4 ANIMALS INCLUDING HUMANS

Knowledge & understanding statutory requirements:

4b1: describe the simple functions of the basic parts of the digestive system in humans

4b2: identify the different types of teeth in humans and their simple functions

4b3: construct and interpret a variety of food chains, identifying producers, predators and prey.

Pupils should be introduced to the main body parts associated with the digestive system, for example, mouth, tongue, teeth, oesophagus, stomach and small and large intestine and explore questions that help them to understand their special functions.

Pupils might work scientifically by: comparing the teeth of carnivores and herbivores, and suggesting reasons for differences; finding out what damages teeth and how to look after



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them. They might draw and discuss their ideas about the digestive system and compare them with models or images.

Lower KS2 - Working Scientifically

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lks2w4: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

lks2w5: recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

lks2w6: reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

lks2w7: using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

lks2w8: identifying differences, similarities or changes related to simple scientific ideas and processes

lks2w9: using straightforward scientific evidence to answer questions or to support their findings.

Lessons:

1. To identify and locate the main organs of the digestive system – learn about the functions of the : mouth, oesophagus, stomach, small intestine and large intestine.
2. To explain how the human digestive system works.
3. To identify different types of human teeth and their functions – incisors, canines, molars.
4. To explain the structure of a tooth – enamel , dentine, pulp, gums, jawbone/skull.
5. To explain how we can look after our teeth – role of dentist, diet , caring for teeth etc
6. To create a food chain and explain what it shows- arrows are needed to show the flow of energy, predator, prey, consumer, producer.
7. To create a food web containing 8 different organisms – learn that this is a flow of energy within an ecosystem in a more complex way.

Vocabulary



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Digestive system , mouth, oesophagus, stomach, small intestine , large intestine, incisors, canines, molars, enamel , dentine, pulp, gums, jawbone/skull, dentist, toothpaste, dental floss, diet, micro organisms, decay, cavity, acid , toothache the flow of energy, predator, prey, consumer, producer

YEAR 4 STATES OF MATTER

Knowledge & understanding statutory requirements:

4c1: compare and group materials together, according to whether they are solids, liquids or gases

4c2: observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius

4c3: identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Pupils should explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.

Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.

Pupils might work scientifically by: grouping and classifying a variety of different materials; exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party). They could research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid. They might observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting.

Lower KS2 - Working Scientifically

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lks2w5: recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

lks2w6: reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

lks2w7: using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions

lks2w8: identifying differences, similarities or changes related to simple scientific ideas and processes

lks2w9: using straightforward scientific evidence to answer questions or to support their findings.

Lessons:

1. To research the melting and boiling points of different materials – make predictions, record findings on a bar chart.
2. To group substances according to whether they are solids, liquids or gases – learn about how temperature can affect this.
3. To explain how materials change state- how the amount of energy the particles have affects the state of the material (particle model).
4. To investigate the melting point of different materials eg. use a thermometer to measure the melting point of butter, ice and chocolate.
5. To investigate how effective different materials are as thermal insulators eg. use 4 different materials so insulate a cold drink and measure the temperature of the drink every 15mins. Fair test, record results in a line graph showing the temperature of all 4 cups over a 2-hour period.
6. To explain the water cycle
7. To make a solar still and explain how it works. Learn how to make solar still to recover water. Learn that the solar heating of water-laden soil causes some water to evaporate which can then be captured by a plastic sheet where it evaporates and is recovered by bowl or mug.
8. To investigate how temperature affects evaporation rates – eg. record the capacity of 4 different containers holding 100ml of water, placed in locations with different temperatures. Measure over the course of 14 days and record results in a line graph.

Vocabulary

Heating, boiling, boiling point, temperature, solid, liquid, gas, state, change of state, freeze, melt, evaporate, condense, energy, particle, thermometer, thermal insulator, water cycle, evaporation, condensation, precipitation, solar still.

YEAR 4 SOUND

Knowledge & understanding statutory requirements:



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- 4d1:** identify how sounds are made, associating some of them with something vibrating
- 4d2:** recognise that vibrations from sounds travel through a medium to the ear
- 4d3:** find patterns between the pitch of a sound and features of the object that produced it
- 4d4:** find patterns between the volume of a sound and the strength of the vibrations that produced it
- 4d5:** recognise that sounds get fainter as the distance from the sound source increases.

Pupils should explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.

Pupils might work scientifically by: finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. They could make and play their own instruments by using what they have found out about pitch and volume.

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Lessons:

1. To explain how sounds are made and how we hear them .That sound travels through from an object, through a medium (usually air) , into the ear where they are carried down the ear canal and processed by the brain. How the ear works.



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2. To investigate how well sound travels through different materials. Investigate how effective 5 different materials are at blocking sound. Recognise the difficulty of accurately measuring the loudness of sound, so could measure 3 times and choose the median measurement. Use results to create a bar chart and place materials in order of effectiveness as sound insulators.
3. To place different sounds in order of pitch – carry out an investigation where 5 different water containers are placed in order, depending on the pitch made when air is blown across the top of each. Attempt to find a pattern and explain results.
4. To make a string tuned instrument. (DT link)
5. To place sounds in order of pitch and volume – measure the pitch and volume of sounds made when 5 different balls are dropped. Recognise the difficulty of measuring pitch and volume without equipment. Take 5 measurements and then choose the modal value. Transfer pitch and volume results to a scatter graph.
6. To investigate how to affect the volume of a percussion instrument – drop a weight from different heights onto a drum and measure the volume of sound created. Recognise the difficulty of measuring volume without equipment, so take a measurement 5 times and find the mean. Create a line graph to show the results. Attempt to explain the relationship between the height of the weight and the volume of the sound.
7. Investigate how distance affect how well we can hear a sound. In the hall or playground, investigate the maximum distance someone can hear one of the body sounds like a clap, sniff, cough, foot stamp of thigh slap. Place in order of loudness on a bar chart. Discuss again, the difficulty of getting results without measuring equipment and ways to improve the investigation- fair test.
8. To investigate the relationship between distance and volume. Investigate the height a ball needs to be dropped from in order to be heard at different distances. Predict and then measure the height required, recording results in a table. Create a line graph and explore the link between the distance and the minimum height (and therefore volume) required.

Vocabulary

Ear canal, medium eg. air, ear canal, processed, brain , vibration, outer ear, eardrum, middle ear , hammer, anvil, stirrup, cochlea, electrical signals , auditory nerve, brain, sounds, sound insulator, loudness, pitch , stringed instrument , volume, scatter graph, median, mode/modal , mean , maximum/minimum ,

YEAR 4 ELECTRICITY

Knowledge & understanding statutory requirements:



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4e1: identify common appliances that run on electricity

4e2: construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers

4e3: identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery

4e4: recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit

4e5: recognise some common conductors and insulators, and associate metals with being good conductors.

Pupils should construct simple series circuits, trying different components, for example, bulbs, buzzers and motors, and including switches, and use their circuits to create simple devices. Pupils should draw the circuit as a pictorial representation, not necessarily using conventional circuit symbols at this stage; these will be introduced in year 6.

Note: Pupils might use the terms current and voltage, but these should not be introduced or defined formally at this stage. Pupils should be taught about precautions for working safely with electricity.

Pupils might work scientifically by: observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit.

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Lessons:



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1. To investigate which objects are conductors and which are insulators. Learn what these are and use a simple electrical circuit to investigate. Draw table to show results and present in the form of a Venn diagram.
2. To identify which machines need electricity to work. Look at 10 familiar household machines and discuss non-electrical alternatives and vice versa.
3. Identify electrical components and their symbols – learn there are 6 different electrical components : bulb, switch, cell, battery, buzzer, bell.
4. To create a simple electrical circuit – use simple apparatus , look at illustrations of 5 different circuits and attempt to create them. Then attempt to create a circuit diagram and see what happens when each circuit is completed.
5. To predict whether a circuit will work and how it can be fixed.
6. Explain how an electrical switch works. Look at 4 different circuit diagrams. Predict and observe whether the circuit will function correctly when placed in different positions in the circuit. Attempt to find a general rule from findings.
7. To identify situations when electricity can be dangerous - how water, metal and our bodies conduct electricity.

Vocabulary

Conductor, insulator, circuit, bulb, cell, wire , electricity, electrical, machine, electrical components, switch, buzzer, bell , electrical symbol, circuit diagram, simple circuit , dangerous , danger