

Science in Year 4

Living things and their Habitats (Classifications) – Autumn 1

Statutory requirements

- recognise that living things can be grouped in a variety of ways.
- 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.

Observations over time (non statutory)

- pupils should use the local environment throughout the year to raise and answer questions to identify and study plants and animals in their habitats.
- identify how habitats change throughout the year.

Working scientifically Objectives

-ask relevant questions and use different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.

-set up simple practical enquiries, comparative and fair tests.

-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

-gather, record, classify and present data in a variety of ways to help in answering questions.

-record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

-report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

-use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

-identify differences, similarities or changes related to simple scientific ideas and processes.

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

Notes and guidance (non-statutory)

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.

Vocabulary

environment habitat micro-habitat seasons Autumn Winter Spring Summer Classify vertebrate invertebrate organism fish amphibians reptiles birds mammals conditions weather provide predator prey

Science in Year 4

Animals including Humans - Autumn 2

(Animals: teeth, digestive system + food chains)

Statutory requirements

-construct and interpret a variety of food chains, identifying producers, predators and prey.

Working scientifically Objectives

-ask relevant questions and using different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.

-set up simple practical enquiries, comparative and fair tests.

-make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

-gather, record, classify and present data in a variety of ways to help in answering questions, whilst beginning to use simple scientific language.

-record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

-report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

-use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

-identify differences, similarities or changes related to simple scientific ideas and processes.

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

Notes and guidance (non-statutory)

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 them.

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

Vocabulary

Predator prey producer lungs oesophagus intestine liver digestion

Carnivore herbivore eco system depend organism apex predator food web molars premolars incisors baby teeth digest

Science in Year 4

Animals including Humans – Spring 1 (Humans :Teeth and the digestive system)

National Curriculum statutory requirements:

- describe the simple functions of the basic parts of the digestive system in humans.
- identify the different types of teeth in humans and their simple functions.

Observations over time (non-statutory)

- pupils should use the local environment throughout the year to raise and answer questions that help to identify; study plants and animals in their habitat. identify how habitats change throughout the year.

Working scientifically statutory requirements:

- ask relevant questions and begin to plan different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.
- set up simple practical enquiries, comparative and fair tests, with increasing independence and confidence.
- make systematic and careful observations and where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers with increasing independence and confidence.
- gather, record, classify and present data to answer questions, including diagrams and charts, and oral and written explanations.
- report on findings - including results and conclusions.
- use results to draw simple conclusions, predictions and suggest improvements; identify new questions that arise from data, making new predictions.

Notes and guidance (non-statutory)

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

Vocabulary

Teeth: molar pre-molar incisor canine enamel plaque decay dentine enamel crown pulp enzymes root acid attack fluoride

Digestive system: oesophagus stomach gall bladder small intestine pancreas large intestine dissolves microbes rectum expel faeces

Science in Year 4

States of Matter - Spring 2 (Solids, liquids and gasses)

National Curriculum statutory requirements:

- compare and group materials together, according to whether they are solids, liquids or gases.
- observe that some materials change state when heated/cooled, and measure or research the temperature at which this happens in degrees celsius (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Working scientifically statutory requirements:

- ask relevant questions and begin to plan different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.
- set up simple practical enquiries, comparative and fair tests.
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- gather, record, classify and present data in a variety of ways to help in answering questions.
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions identify differences, similarities or changes related to simple scientific ideas and processes.
- using straightforward scientific evidence to answer questions or to support their findings.

Notes and guidance (non-statutory)

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, e.g. 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.

Vocabulary

Solids liquids gasses particles compact spread out loose hard soft grouped together evaporation heated warm change state water butter chocolate wax metals: iron steel copper aluminium silver gold Water particles liquid gas solids measurement evaporation heat warmer cooler shrink wider taller deeper shallower cold surface area. watercycle, rivers, lakes oceans, aquafer, land run- off mountain hill evaporation, transpiration, precipitation, condensation heavier water droplets water vapour The Sun sunlight

Science in Year 4

Sound - Summer 1 (Vibrations, pitch and volume)

Statutory requirements

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

Working scientifically Objectives

- ask relevant questions and using different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.
- set up simple practical enquiries, comparative and fair tests.
- make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
- gather, record, classify and present data in a variety of ways to help in answering questions.
- record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
- report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
- use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- identify differences, similarities or changes related to simple scientific ideas and processes.
- using straightforward scientific evidence to answer questions or to support their findings.

Notes and guidance (non-statutory)

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.

Vocabulary

Amp amplitude decibel speed of sound volume ear eardrum cochlear inner ear outer ear loud quiet pitch vary low-pitch high-pitch particles vibration travel wave instrument hammer anvil stirrup

Science in Year 4

Electricity (Simple circuits) – Summer 2

Statutory Requirements

- identify common appliances that run on electricity
- construct a simple series electrical circuit, identify and name its basic parts, including cells, wires, bulbs, switches and buzzers
- 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
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit
- recognise some common conductors and insulators, and associate metals with being good conductors.

Working scientifically Objectives

- ask relevant questions and begin to plan different types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing**) to answer them.
- make systematic and careful observations through use of equipment, with increasing confidence.
- use own criteria for grouping, sorting, comparing and classifying using a key.
- set up simple practical enquiries, comparative and fair tests, with increasing confidence.
- gather, record, classify and present data to answer questions, including diagrams and charts, and oral and written explanations.
- report on findings - including results and conclusions.
- use results to draw simple conclusions, predictions and suggest improvements; identify new questions that arise from data, making new predictions.

Notes and guidance (non-statutory)

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.

Vocabulary

electricity volts battery amp current cells power station substation national grid conductors insulators switches cables wires
appliances crocodile clips buzzer motor alarm switch conductor insulator solar power hydro electric power wind power

Science in Year 4