Science in Year 6

Living things and their Habitat - Autumn 1
(Classifications/Micro-organisms)

National Curriculum Objectives

-describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.
-give reasons for classifying plants and animals based on specific characteristics.

Working scientifically Objectives

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
-observe and make accurate measurements using a range of methods for different investigations.
-use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing)** to test predictions.
-suggest improvements to plans and explain the reasons why.
- present observations and data using appropriate methods
- interpret observations and data, including identifying patterns and data to draw conclusions.
- present and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
-identify further questions arising from results to make predictions to set up further comparative tests.

Notes and guidance (non-statutory)

Pupils should build on their learning about grouping living things in year 4 by looking at the classification system in more detail.
They should be introduced to the idea that broad groupings, such as micro-organisms, plants and animals can be subdivided.
Through direct observations where possible, they should classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).
They should discuss reasons why living things are placed in one group and not another.
Pupils might find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.
Pupils might work scientifically by: using classification systems and keys to identify some animals and plants in the immediate environment.
They could research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in the classification system.

Vocabulary

Karl Linnaeus classify classification system microorganism sub-divide 5 kingdoms species fungi fungus protisa monera moss ferns conifers bacteria viruses

Science in Year 6

Electricity – Autumn 2

(Changes in components/circuit functions)

National Curriculum statutory requirements:

-associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
-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.
-use recognised symbols when representing a simple circuit in a diagram.

Working scientifically statutory requirements:

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
-observe and make accurate measurements using a range of methods for different investigations.
-use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing)** to test predictions.
-suggest improvements to plans and explain the reasons why.
- present observations and data using appropriate methods
- interpret observations and data, including identifying patterns and data to draw conclusions.
- present and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
-identify further questions arising from results to make predictions to set up further comparative tests.

Notes and guidance (non-statutory)

Building on their work in year 4, pupils should construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.
They should learn how to represent a simple circuit in a diagram using recognised symbols.
Note: Pupils are expected to learn only about series circuits, not parallel circuits.
Pupils should be taught to take the necessary precautions for working safely with electricity.
Pupils might work scientifically by: systematically identifying the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.

Vocabulary

electrical electric components switch bulb circuit wire crocodile clip symbol buzzer bulb holder battery holder negative positive voltage cells brighter duller

Science in Year 6

Light - Spring 1
(How we see)

National Curriculum statutory requirements:

- recognise that light appears to travel in straight lines.
- use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Working scientifically statutory requirements:

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
-observe and make accurate measurements using a range of methods for different investigations.
-use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing)** to test predictions.
-suggest improvements to plans and explain the reasons why.
- present observations and data using appropriate methods
- interpret observations and data, including identifying patterns and data to draw conclusions.
- present and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
-identify further questions arising from results to make predictions to set up further comparative tests.

Notes and guidance (non-statutory)

Pupils should build on the work on light in year 3, exploring the way that light behaves, including light sources, reflection and shadows. They should talk about what happens and make predictions.
Pupils might work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works. They might investigate the relationship between light sources, objects and shadows by using shadow puppets. They could extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Vocabulary

partial light source reflect degrees right angle acute angle eye iris pupil cornea eye-ball protection eyelid eye-lash lens retina optic nerve sensitive phenomena spectrum refract white light Newton prisms

Science in Year 6

Animals including humans - Spring 2
(Circulatory system, diet and health)

National curriculum statutory requirements:

-identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
-recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
-describe the ways in which nutrients and water are transported within animals, including humans.

Working scientifically statutory requirements:

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
- observe and make accurate measurements using a range of methods for different investigations.
- use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing)** to test predictions.
- suggest improvements to plans and explain the reasons why.
- present and interpret observations and data, including identifying patterns and data to draw conclusions.
- present, explain and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
- identify further questions arising from results to make predictions to set up further comparative tests.

Notes and guidance (non-statutory)

Pupils should build on their learning from years 3 and 4 about the main body parts and internal organs (skeletal, muscular and digestive system) to explore and answer questions that help them to understand how the circulatory system enables the body to function.
Pupils should learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.
Pupils might work scientifically by: exploring the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Vocabulary

circulation system aorta pulmonary vessels platelets valve atrium ventricle superior vena cava white blood cells red blood cells oxygen carbon dioxide oxygenated plasma lungs arteries organs skeleton digestive system calories intake obesity heart-rate pulse blood flow oxygen lungs cardio cardiovascular

Science in Year 6

Evolution and inheritance - Summer 2

(Changes to living things / adaptation)

National Curriculum statutory requirements:

-recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
-recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
-identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Working scientifically statutory requirements:

- ask questions and develop a line of enquiry based on observations.
- make predictions using scientific knowledge and understanding.
-observe and make accurate measurements using a range of methods for different investigations.
-use and develop keys and other information records to identify, classify and describe with increased accuracy.
- select, plan and carry out the most appropriate types of scientific enquiries (**Pattern seeking, research, observations over time, identifying & classifying, comparative and fair testing)** to test predictions.
-suggest improvements to plans and explain the reasons why.
- interpret observations and data, including identifying patterns and data to draw conclusions.
- present and evaluate reasoned explanations, including data in relation to predictions and hypotheses.
-identify further questions arising from results to make predictions to set up further comparative tests.

Notes and guidance (non-statutory)

Building on what they learned about fossils in the topic on rocks in year 3, pupils should find out more about how living things on earth have changed over time.
They should be introduced to the idea that characteristics are passed from parents to their offspring, for instance by considering different breeds of dogs, and what happens when, for example, Labradors are crossed with Poodles.
They should also appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer, or the development of insulating fur on the arctic fox.
Pupils might find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution. Note: At this stage, pupils are not expected to understand how genes and chromosomes work.

Vocabulary

Inherited inheritance breed bred evolution cross – breed species finches reproduce offspring evolved traits homo sapiens homoerectus Australopithecus Neanderthals climate change insulator poisonous toxins thistle humid