Science Key Objectives

Foundation Stage

Working scientifically (These link to Understanding The World, EYFS Early Learning Goals)

- I question why things happen
- I notice similarities and differences
- I can use my senses and look closely
- I have my own ideas
- I can create simple representations of people and objects
- I test my ideas
- I can talk about things like plants, animals, natural and found objects
- I use equipment and tools carefully

Our bodies

- I can name several parts of my body
- I can tell you that I have bones in my body that protect my body and help to hold it up

Leaf investigation

- I can tell you that leaves fall off the trees in the autumn.
- I can make a prediction about our leaf investigation.

Different materials

- I can use the digital microscope to observe the different materials that teddy bears are made from
- I can compare and contrast the materials used to make old and new teddies

Cooking porridge and soup

- I can tell you bears only eat porridge in stories
- I can tell you that vegetables go soft when you boil them to make soup

Bears and their environments

- I can compare and contrast different types of Bears, where they live, and what they like to eat
- I can tell you that lots of bears hibernate, and I can explain what that means

Mini-beast observations (Snails & Caterpillars)

- I can explain how a caterpillar becomes a butterfly.
- I can plan a snail garden that will keep a snail safe and healthy.

Rocket Mice investigation (linked to Journeys)

- I can suggest ideas for what would make a good rocket mouse e.g. type or size of bottle.
- I can make predictions about our rocket mice investigation.

Year 1

Working scientifically

- Through discussion, I can ask simple questions and recognise that they can be answered in different ways.
- With help, I can observe closely using simple equipment.
- With support, I can perform simple tests.
- Through discussion, I can use simple features to compare objects, materials and living things.
- With help, I can decide how to sort and group objects, materials and living things.
- I can use observations to talk about what I have found out.
- With help, I can gather data to help answer questions.
- With help, I can record data to help answer questions.
- I understand that hand lenses and egg timers are examples of simple measuring equipment.
- With support, I can talk about my findings and answer related questions.

Animals including humans

- I can identify and name common animals from a range of groups (fish, amphibians, reptiles, birds and mammals, including pets) and describe and compare their observable features
- I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).
- I can group animals according to what they eat, saying whether they are carnivores, herbivores or omnivores
- I can name and locate basic parts of the human body, including those related to the senses

Plants

- I can identify and name a variety of common wild and garden flowering plants, and identify and describe their basic structure
- I can identify and name a variety of common British trees, and identify and describe their basic structure
- I can explain the difference between deciduous and evergreen trees, and relate these changes to the seasons

Everyday materials

- I can identify, name and group a variety of everyday materials, including wood, plastic, glass, metal, water, rock, paper, card, fabric, wool (in different forms) and brick
- I can distinguish between an object and the material from which it is made
- I can describe, compare and group materials according to their simple physical properties, including: smooth, rough, hard, soft, transparent, translucent, opaque, shiny, dull, rigid, flexible, waterproof and absorbent

Seasonal changes

- I can name all four seasons and sequence them correctly
- I can describe how nature changes across all four seasons, including changes to deciduous trees
- I can describe how the weather and day length changes across all four seasons
- I can explain why you shouldn’t look directly at the sun

Year 2

Working scientifically

- I can ask simple questions and recognise that they can be answered in different ways.
- I can observe closely using simple equipment.
- I can perform simple tests.
- I can use simple features to compare objects, materials and living things.
- I can decide how to sort and group objects, materials and living things.
- I can use observations and ideas to suggest answers to questions.
- I can gather data to help answer questions.
- I can record data to help answer questions.
- I can talk about my findings, share my ideas and answer questions about my enquiries.

Uses of every day materials

- I can match the following properties to given materials: strong (sturdy, durable), fragile (brittle, flimsy), hard, soft, smooth, rough, absorbent, porous, permeable, impermeable, stretchy, rigid, malleable, stiff, transparent, opaque, translucent
- I can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, rock, paper and cardboard for particular uses.
- I can describe how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Plants

- I can identify common British flowers and plants that grow from seeds and bulbs.
- I know what seeds and bulbs need in order to germinate, and can describe the main changes as they grow into mature plants.
- I know that plants need light, water and the correct temperature to grow strong and healthy.

Animals including humans

- I can describe what is different about a baby and an adult
- I can describe the basic needs of animals, including humans, for survival (water, food, air)
- I can describe the importance of exercise, a balanced diet and hygiene for humans.

Living things and their habitats

- I can identify whether things are alive, dead or have never lived and compare their differences
- I can name different plants and animals and describe how they are suited to different habitats according to their basic needs
- I can describe how animals get their food from other animals and/or from plants, using simple food chains to describe the relationship.

Year 3

Working scientifically

- With support, I can ask relevant questions and use different types of enquiry to answer them.
- With guidance, I can set up simple practical enquiries, comparative and fair tests.
- I can make careful observations.
- I can take increasingly accurate measurements using a thermometer.
- I can use data loggers to take simple measurements.
- With guidance, I can gather, record, classify and present data in different ways to answer questions.
- With support, I can record my findings in different ways, including: using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- With guidance, I can present findings from enquiries in different ways, including: oral and written explanations, displays or presentations of results and conclusions.
- Through discussion, I can use my results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Through discussion, I can identify differences, similarities or changes related to simple scientific ideas and processes.
- I can use simple scientific evidence to answer questions or support my findings from enquiries.

Plants

- I can name, locate and describe the functions of the main parts of plants, including those involved in transporting water and nutrients
- I can explain that plants need the following to stay alive and grow: air, light, water, nutrients from soil, and room to grow; and describe how these requirements vary from plant to plant.
- I can explain the part that flowers play in the life cycle of flowering plants, including pollination, seed formation
- I can explain that seeds may be dispersed through different methods, including: wind, bursting, water and seeds as food.

Rocks

- I recognise that rocks are a natural material and that soils are made from rocks and organic matter
- I can identify, compare and group rocks in different ways according to their properties, including: density, colour, texture and whether they are hard, soft, permeable, impermeable or durable
- I can describe how fossils are formed when an organism dies, is buried and then compressed

Forces

- I can explain that friction is a force that occurs between two surfaces that slide against each other in opposite directions
- I can describe how different surfaces affect how things move
- I can describe the effects of simple forces that act at a distance (magnetic forces, including those between like and unlike magnetic poles)

Animals including humans

- I can name and describe the functions of the main parts of the musculoskeletal system
- I can explain that, unlike plants, animals and humans cannot make their own food and get nutrition from what they eat

- I can explain (in simple terms) the role of different food groups within a balanced diet including: fruit and vegetables, carbohydrates, dairy, oils, protein, fibre and water

Light

- I understand that dark is the absence of light, and that we need light in order to see
- I can explain how shadows are formed when light from a light source is blocked by an opaque object
- I can explain why the size of a shadow may change

Year 4

Working scientifically

- I can ask relevant questions and use different types of enquiry to answer them.
- I can independently set up simple practical enquiries, comparative and fair tests.
- I can make systematic and careful observations.
- I can take accurate measurements, using standard units, using a range of equipment, including thermometers.
- I can use data loggers to take a range of measurements.
- I can select the most appropriate way to gather, record, classify and present data to answer questions.
- I can select the best way record my findings, including: using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- I can select the most appropriate way to present findings from enquiries, including: oral and written explanations, displays or presentations of results and conclusions.
- I can use my results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- I can identify differences, similarities or changes related to simple scientific ideas and processes.
- I can identify the most straightforward scientific evidence to answer questions or support my findings from enquiries.

Living things and their habitats

- I can group living things in a variety of ways, including according to specific features and different habitats.
- I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.
- I can explain how environmental changes may have an impact on living things, sometimes posing dangers to them

Sound

- I can use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard
- I can describe the relationship between the pitch of a sound and the features of its source
- I can describe the relationship between the volume of a sound, the strength of the vibrations and the distance from its source

States of matter

- I can describe the characteristics of different states of matter (solids, liquids and gases) and group materials on this basis
- I can describe how materials change state at different temperatures, using this to explain everyday phenomena
- I can explain the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Animals including humans

- I can name and describe the functions of the main parts of the digestive system
- I can identify the different types of teeth in humans and explain their simple functions.
- I can construct and interpret a variety of food chains, identifying producers, predators and prey

Electricity

- Construct a simple series circuit, identifying and naming 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 the complete loop with a battery, or if a switch is open or closed.
- Recognise some common conductors and insulators, and associate metals with being good conductors.

Year 5

Working scientifically

- With guidance, I can plan different types of enquiry to answer questions.
- Through discussion, I can recognise and control variables where necessary.
- With support, I can take measurements with increasing accuracy using a range of scientific equipment, taking repeat readings when necessary.
- I can use data loggers in a range of scientific enquiries.
- I can record data and results in a variety of ways, including: scientific diagrams and labels; classification keys; tables; scatter graphs; bar graphs; line graphs.
- Through discussion, I can use test results to make predictions to set up further comparative and fair tests.
- Through discussion, I can identify how reliable my results are, linking them to causal relationships in my conclusions.
- I can report and present findings from enquiries in oral and written forms, such as displays and other presentations.
- I can identify scientific evidence that has been used to support or refute ideas or arguments.

Living things and their habitats

- I can explain the life process of reproduction in some plants (spider plants/flowering plant) and animals (badgers) in our local environment
- I can describe and compare some animal life cycles, including mammals (lions/humans), amphibians (frogs), birds (swans) and insects (butterflies)

Plants

- I can name, locate and describe the functions of the main parts of plants, including those involved in reproduction in flowering plants

Forces

- I can explain and describe the effects of gravity as a pulling force and understand the difference between weight and mass.
- I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- I can identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force and make a job easier

Animals including humans

- I understand that reproduction takes place for humans to exist and that human growth begins in the womb, including the terms: prenatal, fertilization, embryo, foetus
- I can name and explain the 6 stages of human development after birth: infancy, childhood, puberty, early adulthood, middle adulthood, late adulthood/old age
- I can identify what humans can and can't do at each stage of development, and can describe how appearance changes at each stage of development, including up to old age.

Earth and space

- I can describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system.
- I can explain the apparent movement of the sun across the sky in terms of the Earth's rotation
- I can explain that the Earth's rotation results in day and night

Properties and changes of materials

- I can compare, identify and group everyday materials on the basis of their properties, including their hardness, roughness, malleability, absorbency, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
- I can demonstrate that dissolving, mixing and changes of state are reversible changes through evaporation, filtration and changes in temperature
- I can 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.
- I can explain that some materials will dissolve in liquids to form a solution, and describe how to recover a substance from a solution.
- I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.

Year 6

Working scientifically

- I can select and plan the most appropriate type of scientific enquiry to answer specific questions.
- I can identify and explain which variables need to be controlled.
- I can select and use the most appropriate equipment to take measurements accurately.
- I can independently select the most appropriate way to record data and results from the following: scientific diagrams and labels; classification keys; tables; scatter graphs; bar graphs; line graphs.
- I can use my test results to make predictions for further comparative and fair tests.
- I can select the most appropriate way to report and present my findings with clarity and appropriate scientific language.
- In my conclusions, I can explain how reliable my results are and the causal relationships
- I can identify a range of scientific evidence to support and refute ideas or arguments.

Living things and their habitats

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

Electricity

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

Animals including humans

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

Light

- I can use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects
- I can explain how the shape of a shadow is formed by the shape of the object blocking the light.

Evolution and inheritance

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