Science Primary Curriculum (Draft)

Working Scientifically

- observing closely using simple equipment
- performing simple tests
- identifying and classifying
- recording findings using standard units, drawings, diagrams, photographs, simple prepared formats such as tables and charts, tally charts, and displays
- setting up simple comparative and fair tests, using a range of equipment including dataloggers
- beginning to make accurate measurements using standard units
- recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables
- reporting on findings from investigations, including written explanations of results and conclusions, displays or presentations
- using results to draw simple conclusions and suggest improvements and predictions for setting up further tests
- planning investigations, including, recognising and controlling variables where appropriate
- taking measurements using a range of scientific equipment with increasing accuracy and precision
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models
- reporting findings from investigations, including written explanations of results, explanation involving causal relationships, and conclusions
- presenting reports of findings in written form, displays and presentations
- continuing to develop the ability to use test results to make predictions to set up further comparative and fair tests

Animals including Humans

- identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates
- 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 (birds, fish, amphibians, reptiles, mammals and invertebrates, and including pets) and describe how they are suited to their environment
- identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense
- explain that animals including humans have offspring which grow into adults
- explain the basic needs of animals, including humans, for survival (which are water, food and air)
- describe the importance for humans of exercise and eating the right amounts of different types of food
- explain that animals, including humans, need the right types and amount of nutrition and that they cannot make their own food; they get nutrition from what they eat
- describe the ways in which nutrients, water and oxygen are transported within animals, including humans
- identify that humans and some animals have skeletons and muscles for support and movement
- identify and name the basic parts of the digestive system in humans
- identify the simple functions of the teeth and different types of teeth in humans
- Identify and name the basic parts and organs of the human circulatory and gaseous exchange systems, and explain their functions, including:
- - human circulatory system - the heart, blood vessels, blood, blood pressure and clotting
- - gaseous exchange system - lungs, nose, throat, bronchi, bronchial tubes, diaphragm, ribs and breathing

Classification of Living Things

- identify and name a variety of living things (plants and animals) in the local and wider environment, using classification keys to assign them to groups
- give reasons for classifying plants and animals based on specific characteristics and how they are suited to their environment

Evolution and Inheritance

- describe how plants and animals, including humans, resemble their parents in many features
- explain how the human skeleton has changed over time, since we separated from other primates, and discuss the advantages and disadvantages of being on two feet rather than four
- give reasons why living things produce offspring of the same kind, but in many cases offspring are not identical with each other or with their parents
- explain that evolution happens over time, fossils provide information about living things that inhabited the Earth many years ago; how animals and plants are suited to and adapt to their environment in different ways; and how this leads to evolution

Plants

- identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen
- describe the basic structure of a variety of common plants including roots, stem, leaves and flowers
- describe how seeds and bulbs grow into mature plants
- describe how plants need water, light and a suitable temperature to grow and stay healthy
- identify and describe the functions of different parts of plants: roots, stem, leaves and flowers
- identify the requirements of plants for life and growth (air, light, water, nutrients from soil and space) and how they vary from plant to plant
- describe the ways in which nutrients, water and oxygen are transported within plants

Habitats

- identify that living things live in habitats to which they are particularly suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- identify and name a variety of plants and animals they study in a variety of habitats, including microhabitats
- describe how animals obtain their food from plants and other animals using the idea of a simple food chain, and identify and name different sources of food
- identify and name a variety of living things that can be grouped as producers, consumers, predator, prey, herbivores, carnivores and omnivores (including examples of plants and animals)
- explain, using food chains and simple food webs, how feeding relationships occur in the local environment, including a variety of habitats and micro habitats

All Living Things

- explain the differences between things that are living and things that have never been alive
- describe the life cycles common to a variety of animals including humans (birth, growth, development, reproduction, death), and to a variety of plants (growth, reproduction and death)
- describe respiration as the activity that releases energy from food as a fuel to maintain the body's activity, and identify that plants also respire
- explain the classification of living things into broad groups according to common observable characteristics and based on similarities and differences, including plants, animals and micro-organisms
- compare the life process of reproduction amongst plants and animals
- describe the changes as humans develop from birth to old age

Forces and Motion

- describe how things move at different speeds, speed up and slow down, using simple comparisons, comparative vocabulary and superlative vocabulary

Forces and Magnets

- explore and discuss how a push or a pull is exerted by something and acts on something else
- describe how some forces are made by contact (pushing, pulling) while others act at a distance (e.g. gravity and magnets)
- explain how gravity pulls things down, and that on the Earth's surface, we are supported by a contact force with the ground
- describe the use of magnets in familiar objects
- explain that magnets attract magnetic materials; that magnets work through, e.g. cardboard
- make a magnet

Forces

- compare and give reasons, based on testing, for how forces, including gravity, friction, air and water resistance, affect the movement of a variety of objects
- explain, through observation, that forces push and pull objects, making them change shape, and that there is always something doing the pushing or pulling either by contact or at a distance
- explain that drag forces tend to slow things down, including air resistance and, to a greater extent, resistance in liquids
- measure the size of a force
- explain the idea of speed
- determine the distance travelled based on the speed and time of travel

Static Electricity and Magnetism

- explain that magnets have two poles, and that magnets can both attract and repel – unlike poles attract and like poles repel
- describe the effects of static electricity and show that they occur when some materials are rubbed together

Electricity

- describe the use of electricity to power common appliances
- construct a simple electric circuit, demonstrating that the circuit must be correctly constructed and complete in order for components to function
- explain that some materials conduct electricity while others do not, using results of any comparative tests
- explain about closed and open circuits, and that a switch placed anywhere in a circuit switches everything on/off
- identify and name the basic parts of a simple electric series circuit, including cells, wires, bulbs, switches, and buzzers, and compare and give reasons for variations in how components function, including brightness of bulbs, loudness of buzzers and on/off position of switches
- explain that short circuits may cause wires to heat up and that fuses are electrical safety devices that are triggered by short circuits
- explain the effect of changing the voltage of a battery

Light

- identify and name a variety of sources of light that we can see with our eyes, including electric lights, flames and the Sun
- explain that darkness is the absence of light
- compare the variety of sources of light, using simple comparisons, comparative vocabulary and superlative vocabulary
- describe the features of day and night, including changes in light and temperature
- describe the movement of the Sun across the sky during the day
- explain how shadows are made when a light source is blocked by something that is not transparent
- investigate the size of shadows
- explain that objects are seen because they give out or reflect light into the eye, using results of any comparative tests. Explain the scientific idea that light travels in straight lines from a light source or is reflected from a surface into the eye
- explain that light can be broken into colours and that different colours of light can be combined to appear as a new colour
- explain how the ray model of light explains the size of shadows
- use simple optical instruments

Sound

- identify and name a variety of sources of sound that we can hear with our ears, and how the sounds are made
- compare the variety of sources of sound, using simple comparisons, comparative vocabulary and superlative vocabulary
- explain that sound travels away from sources and get fainter as it does so
- develop understanding of patterns of pitch and volume, and explore varying sound systematically
- explain how sounds are heard using results of any comparative tests, and the scientific idea that sounds are made by vibrations that travel from a source and through materials (solids, liquids and gases) to the ear

State of Matter

- compare and group together materials according to whether they are solids, liquids or gases
- explain that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C)
- compare and give reasons, based on measurements, for changes to the state of water, using correct scientific vocabulary
- identify the part played by evaporation and condensation in the water cycle

Properties of Everyday Materials and Reversible Change

- compare and group together everyday materials based on evidence from comparative tests and fair tests, including hardness, solubility, conductivity and insulation (electricity and heat), behaviour with magnets
- explain that some substances will dissolve in liquid to form a solution, and how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including filtering, sieving and evaporating
- give reasons, where appropriate, for the uses of everyday materials based on evidence from comparative tests and fair tests, including metals, wood and plastic
- demonstrate that dissolving, mixing and change of state are reversible changes

Changes that form New Materials

- explain that some changes result in the formation of new materials, and that this kind of change is difficult to reverse

Everyday Materials and Uses

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties
- find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching
- based on testing, explore differences between materials, including attraction to a magnet, and floating or sinking
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet or will sink/ float

Rocks

- compare and group together different kinds of rocks on the basis of their simple physical properties
- relate the simple physical properties of some rocks to their formation (igneous or sedimentary)
- describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock

Earth and Space

- explain that the Sun is at the centre of our solar system and that the Sun, Earth and Moon are approximately spherical
- explain that the Sun is one of a great many stars in the galaxy called the Milky Way, and the Milky Way is one of a vast number of galaxies in the universe
- explain that there are other planets around distant stars, and name some constellations, as observed by Earth
- explain that the Earth moves around the Sun, taking one year to do so; that the Moon moves around the Earth, taking 28 days to do so; and that the Earth revolves, taking one day
- identify the four seasons and the regular changes in sunlight and weather associated with them in the UK

Key:

Year 1
Year 2
Year 3
Year 4
Year 5
Year 6