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|  | SCIENCE END POINTS | | | | |
|  | EYFS | | | | |
| R | **Early learning goals:**   * Know the names of the seasons and associated vocabulary to describe each one e.g. leaves changing colour, flowers blooming, animals gathering food, animals hibernating, animals giving birth, Spring, Summer, Autumn, Winter * Know vocabulary linked with the weather e.g. wind, windy, cloud, cloudy, rain, raining, snow, snowing, temperature, hot, cold, icy, wet, dry * Name some common animals and plants found in the local environment. * Know that butterflies and caterpillars belong to the same life cycle * Recognise some different environments than the one they live in and use associated vocabulary e.g. seaside, countryside, desert, ocean, grasslands, city, houses, roads, * Identify and describe how changes of state occur e.g. how ice melts, how a shadow is formed. * Know the importance of caring for the environment * Know that magnets attract to some materials but not others | | | | |
|  | **EYFS Working Scientifically:**   * Know that they can explore the environment with their five senses * Know how things work and how things change * Choose the resources needed to explore * Make observations and create simple drawings * Make simple recordings e.g. weather symbols | | | | |
| Key Stage 1 | | | | | |
| 1 | Materials | Animals Inc. Humans | | Seasonal Changes | Plants |
| **End points** | * Give examples of a variety of materials, including wood, plastic, glass, metal, water and rock * Describe the simple physical properties of a variety of everyday materials * Know that materials with similar properties are grouped into metals, rocks, wood, plastic, glass, fabrics * Distinguish between an object and the material from which it is made * Compare and group together a variety of everyday materials on the basis of their simple properties * Know that the properties of a material determine whether they are suitable for a purpose | * I know that there any different animal families including: amphibians, reptiles, birds and mammals * Identify and name a variety of common animals * Know the differences between the characteristics of a range of common animals * Name a variety of common animals that are carnivores, herbivores and omnivores. * Know animals need food to survive | * Know the basic parts of human body * Know which part of the body is associated with which sense * Know about eyes and sight * Know about ears and hearing * Know about the tongue and taste * Know about the sense of ouch * Know how your nose smells | * Know there are four seasons: Spring, Summer, Autumn, Winter * Know the changes that occur in spring * Know the changes that occur in summer * Know the changes that occur in autumn * Know the changes that occur in winter * Know that there are lots of different types of weather: rain, sun, cloud, wind, snow etc. * Observe the changes over the four seasons | * Know that plants grow from seeds and bulbs * Name the basic parts of flowering plants and trees: roots, stem, trunk, leaves, flowers (blossom), fruit * label and describe the basic parts of flowering plants and trees: roots, stem, trunk, leaves, flowers (blossom), fruit * know a variety of plants and trees from the following groups: garden plants, wild plants, deciduous and evergreen trees. * Know the difference between deciduous and evergreen plants * Know that plants need light and water to grow * Know we can eat lots of plants |
| **Vocabulary** | Property descriptions: hard/soft stretchy/stiff shiny/dull rough/smooth bendy/not bendy waterproof, absorbent, opaque/transparent | Fish Amphibian Reptile Bird Mammal Omnivore Herbivore Carnivore, | sight, hearing, touch, taste, smell, head, neck, ear, mouth, shoulder, hands, fingers, leg, foot, thumb, eye, nose, knee, toes, teeth, elbow | Spring, Summer, Autumn, Winter, windy, sunny, overcast, snow, rain, temperature | roots, stem, trunk, leaves, flowers (blossom), fruit, bark, bulb, wild, garden, Deciduous, Evergreen |
| 2 | Materials | Animals Inc. Humans | | Living things and their habitats | Plants |
|  | * Identify and compare the suitability of a variety of everyday materials, (including wood, metal, plastic, glass, brick, rock, paper and cardboard) for different uses. * Know that some materials can have more than one use. For example, metal can be used for coins, cans and cars. * Know that different materials can be used for the same thing, for example spoons can be made from plastic, wood or metal. * Know how the shape of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | * Know that animals, including humans, have offspring which grow into adults * Know that animals need food, water and air to survive * Know the basic stages in a life cycle for animals, including a human * Know the importance of diet, (eating the right amount of different types of food), exercise and hygiene for humans. * Know that animals move in order to survive and give examples of how they move in different ways, to help them survive. | | * Know the meaning of terms ‘living’ ‘non-living’ and ‘dead’ * Compare the differences between things that are living, dead, and things that have never been alive * Know that most living things live in habitats to which they are suited * Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other * Give examples of a variety of plants and animals in their habitats, including microhabitats * Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain. * Identify and name different sources of food | * Know and describe how seeds and bulbs grow into mature plants, through observation. * Know the difference between seeds and bulbs * Know that flowers make seeds to make more plants * Know that plants need water, light and a suitable temperature to grow and stay healthy * Describe the life cycle of a plant * Know that plants adapt to suit their environment |
| **Vocabulary** | waterproof, fabric, rubber, cars, rock, paper, cardboard, wood, metal, glass, brick, twisting, squashing, bending |  | | Living, dead, never alive, habitats, micro-habitats, food, food-chain, leaf litter, shelter, seashore, woodland, ocean, rainforest, desert, damp, shade, conditions | Seeds, bulbs, growth, plant, energy, condition, survive, forest, desert, life cycle, pollination |

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| Lower Key Stage 2 | | | | | | |
| 3 | Plants | Materials - Rocks | Animals Inc. Humans | Light | Forces and Magnets |  |
|  | * Describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers * Know the role flowers play in the life cycle of flowering plants, e.g. pollination, seed formation and seed dispersal * Know the additional needs of plants for survival and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant * Investigate the way in which water is transported within plants | * Know there are different types of rock: sedimentary, igneous and metamorphic and they have different properties * Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties * Know that different rocks can be used for different purposes * Describe in simple terms how fossils are formed when things that have lived are trapped within rock * Know that soils are made from rocks and organic matter | * Know that animals, including humans, need the right types and amount of nutrition from the food they eat * Know the importance of a balanced diet for health and survival * Know that humans and some other animals have skeletons and muscles for support * Identify skeletons and muscles within different animals, explaining how these support, aid movement and protection | * Identify that we need light in order to see things and that dark is the absence of light * Notice that light is reflected from surfaces * Describe how some materials reflect more light than others * recognise that light from the sun can damage eyes * Know how shadows form when the light from a light source is blocked by an opaque object * Know shadows can vary in size and direction | * Describe how things move differently on different surfaces * Know that some forces need contact between 2 objects, but magnetic forces can act at a distance * Know magnets attract or repel each other and attract some materials and not others and give examples * Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials * Describe magnets as having 2 poles * Predict whether 2 magnets will attract or repel each other, depending on which poles are facing |  |
| **Vocabulary** |  |  |  |  |  |  |
| 4 | Electricity | Living things and habitats | Animals Inc. Humans | Sound | States of Matter |  |
|  | * Identify common appliances that run on electricity * Construct, draw and label a simple electrical circuit, identifying and naming its basic parts, (including cells, wires, bulbs, switches and buzzers) * Identify whether a lamp will light in a simple series circuit based on whether the lamp is part of a complete circuit, with a battery * Recognise some common conductors and insulators, and associate metals with being good conductors * Know the difference between a conductor and an insulator, giving examples of each * Know electrical safety hazards | * Know that living things can be grouped in a variety of ways, based on their characteristics * Know the reasons for grouping animals in a particular way * Know how a classification key is used to help group, identify and name a variety of plants and animals * Know that environments can change and this can sometimes pose a danger to living things * Give examples of dangers posed to animals based on environmental change | * Describe the simple functions of the body parts of the digestive system in humans: mouth, oesophagus, stomach, small and large intestine, anus * Identify the different types of teeth in humans and their simple functions: incisors, canines, molars * Know that different types of teeth do different jobs * Know that food is broken down by the teeth and further in the stomach * Construct and interpret a variety of food chains, identifying producers, predators and prey * Know that nutrients move through a food chain | * Know that sound travels from its source in all direction and we hear it when it travels to our ears * Identify how sounds are made, associating some of them with something vibrating * Know how 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 | * Identify and group substances together, according to whether they are solids, liquids or gases * Know that some materials change state when they are heated or cooled * Measure or research the temperature at which this happens in degrees Celsius (°C) * Know the part evaporation and condensation play in the water cycle * Know that the rate of evaporation is linked with temperature |  |
| **Vocabulary** |  |  |  |  |  |  |
| Upper Key Stage 2 | | | | | | |
| 5 | Earth and space | Living things and habitats | Animals incl. humans | Materials and their properties | Forces |  |
|  | * Describe the movement of the Earth and other planets around the sun * Describe the movement of the moon relative to the Earth * Describe the sun, Earth and moon as approximately spherical bodies * Know that objects like planets, moons and stars spin * Describe the idea of the earth’s rotation to explain day and night (and the apparent movement of the sun across the sky) | * Know the life cycle of different living things e,g. mammal, amphibian, insect, bird * Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird * Know the process of reproduction in plants * Know the process of reproduction in animals | * Describe the stages within the growth and development of humans * Know the changes that occur to humans during puberty * Describe the changes human may experience during old age * Compare gestation periods between humans and other animals | * Describe materials by their properties: e.g. hardness, solubility, transparency, conductivity, magnetism * Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution * Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating * Know how fair and /or comparative tests can be used to select materials for everyday use * Demonstrate that dissolving, mixing and changes of state are reversible changes * Give examples to explain reversible and non-reversible changes | * Know that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object * Know the effect of gravity on our lives * Know how friction, air resistance and water resistance act between moving surfaces * Know that some objects require large forces to make them move * Describe how some mechanisms, including pulleys, levers and gears can enable e a smaller force to have a greater effect |  |
| **Vocabulary** | Sun, star, moon, planet, sphere, spherical object, satellite, orbit, rotate, axis | Asexual reproduction, fertilise, gestation, life-cycle, metamorphosis, offspring, pollination, reproduction, sexual reproduction | Adolescence, puberty, adulthood, reproduce, gestation, uterus, menstruation, life expectancy | Materials, solid, liquid, gas, conductor, insulator, thermal, electrical, transparent, translucent, opaque | Forces, gravity, earth’s gravitational pull, weight, mass, streamlined, mechanism, friction, air resistance, water resistance, buoyancy |  |
| 6 | Electricity | Living things and habitats | Animals Inc. humans | Light | Evolution and Inheritance |  |
|  | * To know and use recognised symbols when representing a simple circuit in a diagram * 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 | * Know all living things share a set of characteristics * Know how plants, animal and microorganisms are classified into broad groups based on common observable characteristics * Know the Linnaean System for classification * Give examples of groups and sub-groups e.g.: invertebrates as insects, spiders, snails, worms and vertebrates as amphibian, mammal, bird, fish and reptile * Give reasons for classifying plants and animals based on specific characteristics | * identify and name the main parts of the human circulatory system * Describe the functions of the heart, blood vessels and blood * Describe the ways in which nutrients and water are transported within animals, including humans * Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function | * Know that light appears to travel in straight lines * Know that because light travels in straight lines, 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 * Know why shadows form the same shapes as the objects that cast them | * Recognise that living things produce offspring of the same kind * Understand the concept of Inheritance and know that normally offspring vary and are not identical to their parents * Know how animals are adapted to suit their environment, including animals in the Amazon region * Know how plants are adapted to suit their environment in different ways, including plants in the Amazon region * Understand natural selection and how it may lead to evolution * Know that adaptations may lead to evolution over time * Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago |  |
| **Vocabulary** | Circuit, symbol, cell, battery, voltage, current, amps, resistance, electrons | Characteristics, classify, taxonomist, key, microorganism, Linnaeus System, mould, fungus, virus, bacteria | Circulatory system, heart, atrium, ventricle, valve, blood vessel, artery, vein, oxygenated blood, deoxygenated blood, nutrients, drug | Refraction, prism, visible spectrum, shadow, light source, incident ray, transparent, translucent, opaque | Offspring, inheritance, variation, characteristics, traits, adaptation, habitat, environment, evolution, natural selection, fossil |  |

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| **Focused Assessment of Working Scientifically** (*using TAPS plans)* currently being developed across school | | | | | | | |
|  | **PLAN** | | **DO** | | | **REVIEW** | |
| **Ask Questions and Plan Enquiry** | **Set Up Enquiry** | | **Observe and Measure** | **Record** | **Interpret and Report** | **Evaluate** |
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| **EYFS** | Listen attentively ad respond to what they hear with relevant questions | Show an ability to follow instructions involving several ideas and actions  Be confident to try new activities  Use a range of small tools  Safely use and explore a variety of materials, tools and techniques | | | Explore the natural world around them, making observations an drawing pictures of animals and plants | Participate in discussions, offering their own ideas, using recently introduced vocabulary  Offer explanations for why things might happen  Express their ideas and feelings about their experiences  Know some similarities and differences. Drawing on experiences | |
| **Reception** |  |  | |  |  |  | |
| **KS1**  **Develop close obs** | Ask simple questions and recognise they can be answered in different ways \* | Perform simple tests | | Observe closely using simple equipment | Gather and record data to help in answering questions | Use their observation and ideas to suggest answers to questions. Identify and classify. Use appropriate scientific language to communicate ideas | |
| Year 1 | Umbrella planning (Everyday Materials) | Floating and Sinking (Properties of Materials) | | Plant Structure  (Plants) | Seasonal changes (Seasons throughout the year) | Animal classification (Animals including humans) | Body parts (Animals including humans) |
| Year 2 |  |  | |  |  |  |  |
| **Lower KS2**  **Develop systematic approach** | Ask relevant questions and use different types \* of scientific enquiries to answer them | Set up simple practical enquiries, comparative and fair tests | | Makesystematic and careful observations and, where appropriate, take accurate measurements using standard units  Use 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 findingsusing 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  Identify differences, similarities or changes related to simple scientific ideas and processes | Useresults to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions  Use straightforward scientific evidence to answer questions or to support their findings |
| Year 3 |  |  | |  |  |  |  |
| Year 4 |  |  | |  |  |  |  |
| **Upper KS2**  **Develop independence** | Plandifferent types \*of scientific enquiries to answer questions, including recognising and controlling variables where necessary | Use test results to make predictions and set up further comparative and fair tests | | Takemeasurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate | Recorddata and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs | Report and present findings from enquiries, including conclusions, causal relationships and explanations, in oral and written forms such as displays and other presentations, using appropriate scientific language | Explain degrees of trust in results.  Identify and evaluate scientific evidence (their own and others) that has been used to support or refute ideas or arguments |
| Year 5 |  |  | |  |  |  |  |
| Year 6 | Bulb Brightness (electricity) | Human heart rate (animals Inc. Humans) | | Shadows investigation (light) | Living thing keys (living things and their habitats) | \*\*\*\* | Fossil habitats (evolution and inheritance) |

*\*types of enquiry including: observing changes over time, noticing patterns, grouping and classifying comparative and fair tests, using secondary sources*