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| Science Knowledge progression | | | | | | |
|  | Autumn 1 | Autumn 2 | Spring 1 | Spring 2 | Summer 1 | Summer 2 |
| EY ELG The Natural World  Understanding the world | Children at the expected level of development will:  - Explore the natural world around them, making observations and drawing  pictures of animals and plants;  - Know some similarities and differences between the natural world around  them and contrasting environments, drawing on their experiences and what  has been read in class;  - Understand some important processes and changes in the natural world  around them, including the seasons and changing states of matter. | | | | | |
| Nursery | Understand that we hear with our ears. Explore the environment listening to sounds e.g. listening walk, listening to different birds, listening to the sounds coming from different rooms.  Starting with SEN/D children and the youngest first, get children familiar with their environment in Nursery. These children should then be the leaders of the areas and show other children.  Make observations indoors and outdoors in Nursery. Make collections of natural materials to investigate and talk about.  Know that some snacks and foods help us to grow such as milk.  Name animals you would find on a farm (horse, pig, cow, chicken, goat) and learn the name for its young.  Name animals you would see in the school grounds. (guinea pigs, dogs, fish, frogs, squirrels, wood pigeons)  Sort and match photographs and pictures e.g. sort into flowers or trees, or sort into living and not living. | Use their senses: hands on exploration of natural materials and objects linked to celebrations and festivals, different materials used in baubles on Christmas trees, the feel of candles for a Hannukah and birthday.  Know that candles melt when they burn.  Explore collections of materials with similar and/or different properties.  Talk about what they see.  Make collections of man-made materials to investigate and talk about. Suggestions: plastics, fabrics.  Provide magnifying glasses or a tablet with a magnifying app.  Encourage children to talk about what they see.  Model observational and investigational skills. Ask out loud: “I wonder if…?”  Plan and introduce new vocabulary, encouraging children to use it to discuss their findings and ideas. **Light**  Know what happens when we turn a light source off. Compare the brightness of light sources.  Know and explore how you can shine light through some materials, but not others.  **Electricity**  To know some devices are plugged into power sockets and some use batteries.  To know we can switch off devices to save energy and money. | Provide children with opportunities to change materials from one state to another.  Cooking – combining different ingredients, and then cooling or heating (cooking) them.  Butter melts on toast  Chinese New Year noodles, pancakes.  Freezing – know that water freezes to become ice and that freezing is cooling something down.  Melting – know that melting is warming somethings up. Know that melting is when something changes from a solid to a liquid. Leave ice cubes out (children should not touch to avoid danger of frostbite).  Know that we put on hats, scarves and gloves to keep our body heat in.  Know why and investigate why some materials are good e.g. why wellies are good in puddles and the rain; why some coats are good in the rain; why some materials are good for umbrellas.  Create a simple weather chart. Understand the terms rain, snow, wind, sun. | Explore how different materials sink and float.  Plant seeds and care for growing plants. Know that plants need water and light to survive.  Understand the key features of the life cycle of a plant (sunflower seed) and an animal (caterpillar and chicks). To know plants grow, shoot grow) , die. Animal – birth, grow, change, die. Egg  Begin to understand the need to respect and care for the natural environment and all living things.  Show and explain the concepts of growth, change and decay with natural materials.  Suggestions:  - plant seeds and bulbs so children observe growth and decay over time  - observe an apple core going brown and mouldy over time - help children to care for animals and take part in first-hand scientific explorations of animal life cycles, such as caterpillars or chick eggs.  Encourage children to refer to books, wall displays and online resources. This will support their investigations and extend their knowledge and ways of thinking | Invite different people to visit from a range of occupations, a farmer (Farmlink?) , a vet, a dental nurse, a member of the emergency services or an author.  Plan and introduce new vocabulary related to the occupation, and encourage children to use it in their speech and play. Consider opportunities to challenge gender and other stereotypes.  Understand the features of their bodies. Learn the terms: head, stomach, arms, legs, toes, fingers and feet, teeth.  Know how to look after their own health and hygiene including teeth.  Know to wash hands after visiting the toilet.  Draw round themselves and label the features of their bodies.  Understand that people grow over time.  Know the terms : hurts, aches, throbs, cut, graze.  Know that doctors and nurses need to sometimes look at parts of us to find what might be wrong e.g. ears, eyes, fingers. | **Forces**  Draw children’s attention to forces. Know:  - how the water pushes up when they try to push a plastic boat, balloon, table tennis ball under it  - how they can stretch elastic, snap a twig, but can’t bend a metal rod  - explore springs of different sizes  - magnetic attraction and repulsion  - what happens to their bikes and scooters on different surfaces and ramps.  Understand the safety linked to the sun: not to look directly at the sun; applying sun cream; wearing hats; drinking water.  Understand safety linked to water e.g. sea, rivers, canals etc.  Know how to respond when they feel hot or cold.  Know the difference between day and night in relation to the movement of the sun. Understand the idea of sunrise and sunset.  Learn that there is more daylight in the UK in the summer than in winter. Investigate shadows.  Look, and talk about, how the environment changes in the summer in particular: trees, plants, grass, flowers. Refer back to photographs taken in autumn and winter. |
| Vocabulary | Animal: horse, pig, cow, chicken, goat, guinea pigs, dogs, fish, frogs, squirrels, bird - wood pigeon,  Fur, feathers, scale, tail, wings, beak, claws, paws, hooves, swim, fly, walk.  ears, hear, sound, listen, indoor, outdoor, natural,  Leaves, twigs, bark, feathers, pebbles, same, different, pattern | Natural, man-made, plastic, fabric, paper, wood, magnifying glass, rough, smooth, hard, soft, wax, candle, heat, burn, melt  Light, torch, bulb, shiny, bright, brighter, brightest, Sun, shine, glow, mirror,  Battery, plug, socket, electricity, wire, sound, light, | Pine cone, mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric, solid, liquid, stronger, weaker | Plant, leaf, stem, trunk, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil  Seedling, healthy, unhealthy, strong,  Egg, chick, bird, cocoon, caterpillar, butterfly, grow, change, die, | graze, head, stomach, arms, legs, toes, fingers and feet, teeth, hurt, ache, throbs, cut, germs,  grow, change, baby, toddler, child, adult, old person, | Object, float, sink, water, up, down, bottom, push, pull, magnet, spring, squash, bend, twist, stretch, turn, spin, smooth, rough, fast, flow. |
| Trips/Visitors |  |  |  |  | Vets  Nurse  Fire brigade  Dental nurse | Chorlton Water Park – link with RE topic |
| Key Texts |  |  |  | The Tiny Seed  The Hungry Caterpillar | Michael Recycle |  |
| Reception | Know some of the parts of the body – head, shoulder, knee, toe, foot, leg, arm, hand, hair, eye, nose, mouth. Use colour to describe hair, skin and eye colour – see vocabulary.  Know who is in their immediate family and name and describe people who are familiar to them.  Know how they are similar or different to their friends and family.  Know that autumn follows summer. Take a picture of a tree in the GIFT garden each week to build up a port folio of the changing seasons.  Know some of the changes happening moving from summer to autumn – leaves changing colour and some falling to the ground, getting colder, wetter, conkers and acorns in the ground.  Know that acorns and conkers are the seeds of a tree. | Know the effect of changing seasons on some animals and plants Know what nocturnal means and name some animals that are nocturnal fox, badger, owl.  Know that some animals hibernate during the winter – hedgehogs, squirrels.  Know that winter follows autumn.  Know some of the differences between autumn and winter – shorter days, colder, leaves have fallen from the trees. | Opportunity to explore the natural world and the changing seasons  Know water freezes to become ice. Know that putting ice cubes in different areas of the playground can change how quickly they melt.  Know water melts and becomes water again. Know that a large block of ice changes over time, use string to measure it.  Know that heat helps this process.  Know that heating things can change them – make fruit cupcakes - DT | Know some of the changes moving from winter to spring. Know leaves start to grow on trees.  Know and observe the life cycle of a frog - frog spawn, tadpole, frog.  Know that chickens hatch from eggs.  Know chicks are birds and that they have beaks, feathers and wings.  Know and explore that puddles change over time after it rains.  Know that a life cycle is ongoing. | Know a habitat is where something lives.  Know the names of some habitats: pond, woodland, desert, rainforest  Know and explore different habitats in the local environment: pond, woodland. Know an animal from each habitat -?????Name then  Know frogs live in ponds and on land.  Explore the natural world around them by finding minibeasts in the school grounds. Ladybirds, woodlouse, worms, rosemary beetles, ants, spiders.  Name and describe plants and animals they find in the school grounds – lavender, rosemary, poppies, holly, ??  Some plants (herbs) have a strong smell – lavender, basil, mint and rosemary. Know we have our noses to smell and tongues to taste. | Know that summer follows spring and know the changes – warmer and the way the plants flourish.  Identify the similarities and differences between plants and animals they find in the GIFT garden and those of a beach, seashore.  Know that some objects float and some objects sink.  Know how wheels turn when sand or water is poured through them.  Know how toy cars move down ramps and gutters. |
| Vocabulary | hair (black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (blue, brown, green, grey), skin (black, brown, white),  big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person,  old, young, brother, sister, mother, father, aunt, uncle, grandmother,  grandfather, cousin, friend, family, boy, girl, man, woman  bald, elderly, wrinkles, male, female, freckles  summer, autumn, seasons,  plants, flowers, change, conkers, acorns, | Hibernate, autumn, winter, nocturnal, fox, badger, owl, hedgehogs, squirrels, | Ice, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big,  bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, | Frog spawn, tadpole, frog, beak, feathers, wings, winter, spring, chicks, egg, | Ladybirds, woodlouse, worms, rosemary beetles, ants, spiders.  Name and describe plants and animals they find in the school grounds – lavender, rosemary, poppies, holly, ?? | Float, sink, up down, top, bottom, surface, move, roll, fly, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, |
| Trips/Visitors |  |  |  |  | Chorlton Water Park  Mersey Valley Warden | Coastal visit |
| Key Texts |  |  |  |  | Greta and the Giants  Poo at the zoo |  |
| Year 1 | EVERYDAY MATERIALS  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.  Key Learning:  All objects are made of one or more materials. Some objects can be made from different materials e.g. plastic, metal or wooden spoons.  Materials can be described by their properties e.g. shiny, stretchy, rough etc.  Some materials e.g. plastic can be in different forms with very different  properties.  Key Vocabulary:  Object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through  Everyday Materials – 1, 2, 3, 4, 5, 6, 7, 8, 9  Working scientifically:  Key investigation: sorting and classifying materials, pattern seeking- are all \_\_\_\_\_ made from the same material? Fair test: what is the best material for….. observation over time- ice | ANIMALS including humans  • Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.  Key Learning:  Humans have key parts in common, but these vary from person to person.  Humans (and other animals) find out about the world using their senses.  Humans have five senses – sight, touch, taste, hearing and smelling. These  senses are linked to particular parts of the body.  **Senses – 2,3,4,5.**  Working  Scientifically: | ANIMALS including humans  • Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.  • 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 (fish, amphibians, reptiles, birds and mammals, including pets).  Key Learning:  Animals vary in many ways having different structures e.g. wings, tails, ears etc. They also have different skin coverings e.g. scales, feathers, hair. These key features can be used to identify them. Animals eat certain things - some eat other animals, some eat plants, some eat both plants and animals.  Key Vocabulary:  Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales,  feathers, fur, beak, paws, hooves  • Names of animals experienced first-hand from each vertebrate group  • Parts of the body including those linked to PSHE teaching (see joint  document produced by the ASE and PSHE Association)  • Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear  and tongue  N.B.  The children need to be able to name and identify a range of animals in each group e.g. name specific birds and fish. They do not need to use the terms mammal, reptiles etc. or know the key characteristics of each, although they will probably be able to identify birds and fish, based on their characteristics.  The children also do not need to use the words carnivore, herbivore and  omnivore. If they do, ensure that they understand that carnivores eat other animals, not just meat.  Although we often use our fingers and hands to feel objects, the children should understand that we can feel with many parts of our body.  **Looking at Animals – 1, 2, 3, 4, 6,**  Working Scientifically:  Key investigation: sorting and classifying on observable features, pattern seeking with all fish/amphibian types. | PLANTS  • Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.  • Identify and describe the basic structure of a variety of common flowering plants, including trees.  Key Learning  Growing locally, there will be a vast array of plants which all have specific names. These can be  identified by looking at the key characteristics of the plant. Plants have common parts, but they vary  between the different types of plants. Some trees keep their leaves all year while other trees drop their  leaves during autumn and grow them again during spring.  Key Vocabulary  Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud  Names of trees in the local area  Names of garden and wild flowering plants in the local area  Plant detectives - 1,2,3 and 5.  Local area: Merseybank playing fields/Kenworthy woods  Working scientifically  Key investigation: sorting and classifying plants and trees |  | OVER THE YEAR:  SEASONAL CHANGES  Observe changes across the four seasons.  • Observe and describe weather associated with the seasons and how day length varies.  Key Learning:  In the UK, the day length is longest at mid-summer (about 16 hours) and  gets shorter each day until mid-winter (about 8 hours) before getting longer again.  The weather also changes with the seasons. In the UK, it is usually colder and rainier in winter, and hotter and dryer in the summer. The change in weather causes many other changes. Some examples are: numbers of minibeasts found outside; seed and plant growth; leaves on trees; and type of clothes worn by people.  Key Vocabulary  • Weather (sunny, rainy, windy, snowy etc.)  • Seasons (winter, summer, spring, autumn)  • Sun, sunrise, sunset, day length  Sensing the Seasons 2,3,4,5  (Our changing World plants 1,2,3, 4 – forest school)  Local area: Kenworthy woods/ Merseybank estate/Gift garden  Working Scientifically:  Key investigation: observation over time- how do the seasons change our environment, pattern seeking- do all trees look the same in spring? |
| Year 2 | USES of EVERYDAY MATERIALS  • Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and  cardboard for particular uses.  • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and  stretching.  Key Learning  All objects are made of one or more materials that are chosen specifically because they have suitable  properties for the task. For example, a water bottle is made of plastic because it is transparent allowing  you to see the drink inside and waterproof so that it holds the water. When choosing what to make an object from, the properties needed are compared with the properties of the possible materials, identified through simple tests and classifying activities. A material can be suitable for different purposes and an object can be made of different materials.  Objects made of some materials can be changed in shape by bending, stretching, squashing and  twisting. For example, clay can be shaped by squashing, stretching, rolling, pressing etc. This can be a  property of the material or depend on how the material has been processed e.g. thickness  Key Vocabulary  Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard  Properties of materials – as for Year 1 plus opaque, transparent and translucent, reflective, nonreflective,  Good Choices – 1, 2 ,3 , 7  Shaping Up – 1, 2, 3 ,4  Working scientifically :  Key investigation: sort and classify types of material, pattern seeking- which material can be changed easily?  flexible, rigid  Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching | ANIMALS including HUMANS  • Notice that animals, including humans, have offspring which grow into adults.  • Find out about and describe the basic needs of animals, including humans, for survival (water, food and air).  • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.  Key Learning:  Animals, including humans, have offspring which grow into adults. In humans and some animals,  these offspring will be young, such as babies or kittens, that grow into adults. In other animals,  such as chickens or insects, there may be eggs laid that hatch to young or other stages which  then grow to adults. The young of some animals do not look like their parents e.g. tadpoles.  All animals, including humans, have the basic needs of feeding, drinking and breathing that must  be satisfied in order to survive. To grow into healthy adults, they also need the right amounts  and types of food and exercise.  Good hygiene is also important in preventing infections and illnesses.  Key Vocabulary  Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult,  caterpillar/butterfly), exercise, heartbeat, breathing, hygiene, germs, disease, food types  (examples – meat, fish, vegetables, bread, rice, pasta)  Growing Up 1 – 4  Take Care of Yourself 1 – 4  Working scientifically: | LIVING THINGS AND THEIR HABITATS  Explore and compare the differences between things that are living, dead, and things that have never been alive  • Identify that most living things live in habitats to which they are 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 in their habitats, including micro-habitats  • 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  Key Learning:  All objects are either living, dead or have never been alive. Living things are plants  (including seeds) and animals. Dead things include dead animals and plants and parts  of plants and animals that are no longer attached e.g. leaves and twigs, shells, fur, hair  and feathers (This is a simplification, but appropriate for Year 2 children.)  An object made of wood is classed as dead. Objects made of rock, metal and plastic  have never been alive (again ignoring that plastics are made of fossil fuels).  Animals and plants live in a habitat to which they are suited, which means that animals  have suitable features that help them move and find food and plants have suitable  features that help them to grow well. The habitat provides the basic needs of the  animals and plants – shelter, food and water.  Within a habitat there are different micro-habitats e.g. in a woodland – in the leaf litter,  on the bark of trees, on the leaves. These micro-habitats have different conditions e.g.  light or dark, damp or dry. These conditions affect which plants and animals live there.  The plants and animals in a habitat depend on each other for food and shelter etc. The  way that animals obtain their food from plants and other animals can be shown in a food  chain.Key Vocabulary:  Living, dead, never been alive, suited, suitable, basic needs, food, food chain,  shelter, move, feed  • Names of local habitats e.g. pond, woodland etc.  • Names of micro-habitats e.g. under logs, in bushes etc.  What’s in your habitat? – 1,,2, 3  Our changing World – 1, 3,  Objectives 1 and 3 not covered in Snap Science.  Local area: Chorlton water park  Working Scientifically:  Key investigation: sorting and classifying animals and habitats, living, dead and never alive, food chains/ what they eat, pattern seeking- animals living in habitat x eat x, | PLANTS  Observe and describe how seeds and bulbs grow into mature plants.  • Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.  Key Learning:  Plants may grow from either seeds or bulbs. These then germinate and  grow into seedlings which then continue to grow into mature plants. These mature plants may have flowers which then develop into seeds, berries, fruits etc. Seeds and bulbs need to be planted outside at particular times of year and they will germinate and grow at different rates. Some plants are  better suited to growing in full sun and some grow better in partial or full shade. Plants also need different amounts of water and space to grow well and stay healthy.  Key Vocabulary:  As for Year 1 plus light, shade, sun, warm, cool, water, grow, healthy  The Apprentice Gardener – 1, 2, 3, 4, 5, 6 ,7  Working Scientifically: Key investigation: Fair test- what do plants need most? Observation over time- what happens when we plant seeds and bulbs? |  |  |
| Year 3 | FORCES and MAGNETS  Compare how things move on different surfaces.  • Notice that some forces need contact between two objects, but magnetic forces can act at a distance.  • Observe how magnets attract or repel each other and attract some materials and not others.  • 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 two poles.  • Predict whether two magnets will attract or repel each other, depending on which poles are facing.  Key Learning:  A force is a push or a pull. When an object moves on a surface, the texture of the surface and the  object affect how it moves. It may help the object to move better or it may hinder its movement e.g.  ice skater compared to walking on ice in normal shoes.  A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g.  stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles  – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will  push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together  they will pull together – attract. For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees.  Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that  it attracts  Key Vocabulary  Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar  magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron,  steel, poles, north pole, south pole  L1-4, L6,7  Working scientifically:  Key investigation: sort and classify magnetic v non magnetic, fair test- which surface ramp lets the car move fastest/ slowest? Pattern seeking- what materials are magnetic? | ROCKS  • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.  • Describe in simple terms how fossils are formed when things that have lived are trapped within rock.  • Recognise that soils are made from rocks and organic matter.  Key Learning  Rock is a naturally occurring material. There are different types of rock e.g. sandstone, limestone,  slate etc. which have different properties. Rocks can be hard or soft. They have different sizes of  grain or crystal. They may absorb water. Rocks can be different shapes and sizes (stones, pebbles,  boulders). Soils are made up of pieces of ground down rock which may be mixed with plant and  animal material (organic matter). The type of rock, size of rock pieces and the amount of organic  matter affect the property of the soil.  Some rocks contain fossils. Fossils were formed millions of years ago. When plants and animals  died, they fell to the seabed. They became covered and squashed by other material. Over time the  dissolving animal and plant matter is replaced by minerals from the water.  Key vocabulary  Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil,  marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil  L1, 2, 4, 5, 7, 9, 10  L8- soil investigation (if time)  Working scientifically:  Key investigation: sort and classify rocks, fair test- which soil is best for growing plants in? | PLANTS  Identify and describe the functions of different parts of flowering plants: roots; stem/trunk; leaves; and flowers.  • Explore the requirements of plants for life 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.  • Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.  Key Learning:  Many plants, but not all, have roots, stems/trunks, leaves and  flowers/blossom. The roots absorb water and nutrients from the soil and anchor the plant in place. The stem transports water and nutrients/minerals around the plant and holds the leaves and flowers up in the air to enhance photosynthesis, pollination and seed dispersal. The leaves use sunlight and water to produce the plant’s food. Some plants produce flowers which  enable the plant to reproduce. Pollen, which is produced by the male part of the flower, is transferred to the female part of other flowers (pollination).  This forms seeds, sometimes contained in berries or fruits which are then dispersed in different ways. Different plants require different conditions for germination and growth.  Key Vocabulary:  Photosynthesis, pollen, insect/wind pollination, seed formation, seed  dispersal (wind dispersal, animal dispersal, water dispersal)  L1, L3, L4, L5, L6, L7, L8, L9, L10  Our changing world- not required but may be useful for working scientifically  Local area: Kenworthy woods  Working Scientifically:  Key investigation: obs over time- plants growing and changing, different plants e.g. venus fly traps, water transport in white plants with blue water, pattern seeking- what colour flower do bees visit most? | ANIMALS including HUMANS  • Identify 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.  • Identify that humans and some other animals have skeletons and muscles for support, protection and movement.  Key Learning  Animals, unlike plants which can make their own food, need to eat in order to get the nutrients they need.  Food contains a range of different nutrients – carbohydrates (including sugars), protein, vitamins, minerals,  fats, sugars, water – and fibre that are needed by the body to stay healthy. A piece of food will often provide a  range of nutrients.  Humans, and some other animals, have skeletons and muscles which help them move and provide  protection and support.  Key Vocabulary:  Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones,  muscles, joints, support, protect, move, skull, ribs, spine  L1, L2, L4-8  Working scientifically  Key investigation: fair test- who can write fastest boys or girls? Pattern seeking- who has longer arms Yr 3 or Yr 1? Sort and classify- nutrition types, animals vs plants compare and contrast. | LIGHT  • Recognise that they need light in order to see things, and that dark is the absence of light.  • Notice that light is reflected from surfaces.  • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.  • Recognise that shadows are formed when the light from a light source is blocked by an opaque object.  • Find patterns in the way that the size of shadows change.  Key Learning  We see objects because our eyes can sense light. Dark is the absence of light. We cannot see  anything in complete darkness. Some objects, for example, the sun, light bulbs and candles are  sources of light. Objects are easier to see if there is more light. Some surfaces reflect light. Objects  are easier to see when there is less light if they are reflective.  The light from the sun can damage our eyes and therefore we should not look directly at the sun and  can protect our eyes by wearing sunglasses or sunhats in bright light.  Shadows are formed on a surface when an opaque or translucent object is between a light source  and the surface and blocks some of the light. The size of the shadow depends on the position of the  source, object and surface.  Key Vocabulary  Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface,  shadow, reflect, mirror, sunlight, dangerous  L1-7  L8,9 are creating sunglasses but with very little reference to obj 3. Suggest own planning to cover this objective but these may be useful as starting points.  Working scientifically  Key investigation: sort and classify natural v man made light sources, research using secondary sources- dangers of sun, pattern seeking/obs over time- how do the size of shadows change during the day? |  |
| Year 4 | LIVING THINGS AND THEIR HABITATS  • 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.  Key Learning:  Living things can be grouped (classified) in different ways according to their features. Classification keys can  be used to identify and name living things.  Living things live in a habitat which provides an environment to which they are suited (Year 2 learning).  These environments may change naturally e.g. through flooding, fire, earthquakes etc. Humans also cause  the environment to change. This can be in a good way (i.e. positive human impact, such as setting up nature  reserves) or in a bad way (i.e. negative human impact, such as littering). These environments also change  with the seasons; different living things can be found in a habitat at different times of the year.  Key Vocabulary:  Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate  Who am I: L1 or 2 L3 and 4  Human impact: L1, L5, L6  Local area: Chorlton water park  Mersey bank estate  Working scientifically:  Key investigation: sort and classify living things by animal group, research using secondary sources- dangers humans present to environments | ELECTRICTY  • Identify common appliances that run on electricity.  • Construct a simple series electrical circuit, identifying and naming 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.  Key Learning  Many household devices and appliances run on electricity. Some plug in to the mains and others run on batteries. An electrical circuit consists of a cell or battery connected to a component using wires. If there is a  break in the circuit, a loose connection or a short circuit, the component will not work. A switch can be added to the circuit to turn the component on and off.  Metals are good conductors so they can be used as wires in a circuit. Non-metallic solids are insulators exceptfor graphite (pencil lead). Water, if not completely pure, also conducts electricity.  Key Vocabulary  Electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery,  positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer,  motor, conductor, insulator, metal, non-metal, symbol  N.B.  Children in Year 4 do not need to use standard symbols for electrical components, as this is taught in Year 6.  L1-8  These lessons can be combined to reduce the number of lessons/ combined.  Working scientifically :  Key investigation: sort and classify mains v battery appliances, pattern seeking- where do we find the most electrical sockets in our homes Sorting and classify conductors and insulators- pattern seeking linked to this. | STATES OF MATTER  Compare and group materials together, according to whether they are solids, liquids or gases.  • Observe that some materials change state when they are heated or 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.  Key Learning:  A solid keeps its shape and has a fixed volume. A liquid has a fixed volume but changes in shape to fit the container. A liquid can be poured and keeps a level, horizontal surface. A gas fills all available space; it has  no fixed shape or volume. Granular and powdery solids like sand can be confused with liquids because  they can be poured, but when poured they form a heap and they do not keep a level surface when tipped.  Each individual grain demonstrates the properties of a solid.  Melting is a state change from solid to liquid. Freezing is a state change from liquid to solid. The freezing  point of water is 0oC. Boiling is a change of state from liquid to gas that happens when a liquid is heated to a specific temperature and bubbles of the gas can be seen in the liquid. Water boils when it is heated to 100oC. Evaporation is the same state change as boiling (liquid to gas), but it happens slowly at lower  temperatures and only at the surface of the liquid. Evaporation happens more quickly if the temperature is higher, the liquid is spread out or it is windy. Condensation is the change back from a gas to a liquid caused by cooling.  Water at the surface of seas, rivers etc. evaporates into water vapour (a gas). This rises, cools and  condenses back into a liquid forming clouds. When too much water has condensed, the water droplets in  the cloud get too heavy and fall back down as rain, snow, sleet etc. and drain back into rivers etc. This is  known as precipitation. This is the water cycle.  Key Vocabulary:  Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature,  water cycle  L1-5, L7-9  Working Scientifically:  Key investigation: sort and classify materials, obs over time/fair test- ice shapes and temperatures | ANIMALS including HUMANS  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.  • Construct and interpret a variety of food chains, identifying producers, predators and prey  Key Learning  Food enters the body through the mouth. Digestion starts when the teeth start to break the food down. Saliva is added and the tongue rolls the food into a ball. The food is swallowed and passes down the oesophagus to the stomach. Here the food is broken down further by being churned around and other chemicals are added.  The food passes into the small intestine. Here nutrients are removed from the food and leave the digestive system to be used elsewhere in the body. The rest of the food then passes into the large intestine. Here the water is removed for use elsewhere in the body. What is left is then stored in the rectum until it leaves the body through the anus when you go to the toilet.  Humans have four types of teeth: incisors for cutting; canines for tearing; and molars and premolars for grinding (chewing). Living things can be classified as producers, predators and prey according to their place in the food chain.  Key vocabulary  Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large  intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer,  predator, prey, food chain  L1 (year 3 recap)  L2-4, L 6-9  Working scientifically:  Key investigation: fair test/obs over time: teeth and types of coke, sort and classify animals on basis of producers, predators and prey | SOUND  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.  Key Learning  A sound produces vibrations which travel through a medium from the source to our ears. Different  mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum  (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us  to hear (sense) the sound.  The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as  they travel through the medium. Therefore, sounds decrease in volume as you move away from the  source. A sound insulator is a material which blocks sound effectively.  Pitch is the highness or lowness of a sound and is affected by features of objects producing the  sounds. For example, smaller objects usually produce higher pitched sounds.  Key Vocabulary  Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation  L2-6  Working scientifically Key investigation: pattern seeking- does the size of the instrument impact pitch? Fair test- how to we make the quietest sound? Pattern seeking- does age impact hearing? Pattern seeking- distance and volume |  |
| Year 5 | PROPERTIES and CHANGES of MATERIALS  • Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,  conductivity (electrical and thermal), and response to magnets.  Key Learning  Materials have different uses depending on their properties and state (liquid, solid, gas).  Properties include hardness, transparency, electrical and thermal conductivity and attraction to  magnets.  Key Vocabulary :  Thermal/electrical insulator/conductor,  Working scientifically: | PROPERTIES and CHANGES of MATERIALS  • 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.  • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals,  wood and plastic.  • Demonstrate that dissolving, mixing and changes of state are reversible changes.  • 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.  Key Learning:  Some materials will dissolve in a liquid and form a solution while others are insoluble  and form sediment.  Mixtures can be separated by filtering, sieving and evaporation.  Some changes to materials such as dissolving, mixing and changes of state are reversible, but  some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result  in the formation of new materials and these are not reversible.  Key Vocabulary:  change of state, mixture, dissolve, solution, soluble,  insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material Get Sorted – 1,2,3,4,5,6  Marvellous Mixtures – 1,2,3,4,5  Working scientifically:  Key investigations: Sort and classify materials, fair test- which dissolves the best? Pattern seeking- is all baking heating? | EARTH, SUN and MOON  Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.  • Describe the movement of the Moon relative to the Earth.  • Describe the Sun, Earth and Moon as approximately spherical bodies.  • Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky  Key Learning:  The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them,  but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.  Key Vocabulary:  Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system,  rotates, star, orbit, planets  The Earth and Beyond  1,2,3,4,5  Working Scientifically:  Key investigations: research using secondary sources- how does day and night occur? Pattern seeking- what changes in the moon can we see?  Trip Jodrell Bank | FORCES  • Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling  object.  • Identify the effects of air resistance, water resistance and friction that act between moving surfaces.  • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.  Key Learning:  A force causes an object to start moving, stop moving, speed up, slow down or change direction. Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.  Air resistance, water resistance and friction are contact forces that act between moving  surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.  A mechanism is a device that allows a small force to be increased to a larger force.  The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle  top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines  Key Vocabulary:  Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple  machines, levers, pulleys, gears  Feel the Force  2,3,4,5,8,9,10  Working scientifically:  Key investigations: fair test- what falls fastest? What has the greatest force? | LIVING THINGS AND THEIR HABITATS  Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.  • Describe the life process of reproduction in some plants and animals.  Key Learning  As part of their life cycle, plants and animals reproduce. Most animals reproduce sexually. This  involves two parents where the sperm from the male fertilises the female egg. Animals, including  humans, have offspring which grow into adults. In humans and some animals, these offspring will be  born live, such as babies or kittens, and then grow into adults. In other animals, such as chickens or  snakes, there may be eggs laid that hatch to young which then grow to adults. Some young undergo  a further change before becoming adults e.g. caterpillars to butterflies. This is called a  metamorphosis.  Plants reproduce both sexually and asexually. Bulbs, tubers, runners and plantlets are examples of  asexual plant reproduction which involves only one parent. Gardeners may force plants to reproduce  asexually by taking cuttings. Sexual reproduction occurs through pollination, usually involving wind or  insects.  Key Vocabulary:  Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets,  runners, bulbs, cuttings  Circle of Life –2,3,4,5  Reproduction in plants and animals 1,2,3,4,5,6  (to be taught together summer 1)  Local area: Chorlton water park/Kenworthy wood/ Gift garden  Working Scientifically:  Key investigations: pattern seeking- do all amphibians reproduce the same way? | ANIMALS including HUMANS  • Describe the changes as humans develop to old age.  Key Learning  When babies are young, they grow rapidly. They are very dependent on  their parents. As they develop, they learn many skills. At puberty, a child’s  body changes and develops primary and secondary sexual characteristics.  This enables the adult to reproduce.  This needs to be taught alongside PSHE. The new statutory requirements  for relationships and health education can be found below:  • statutory guidance on Physical health and mental wellbeing (primary  and secondary).  Other useful guidance includes:  • Joint briefing on teaching about puberty in KS2 from PHSE Association  and Association for Science Education  • Briefing on humans development and reproduction in the Primary  Curriculum from PHSE Association and Association for Science  Education.  Key Vocabulary:  Puberty – the vocabulary to describe sexual characteristics  Circle of Life –2,3,4,5  Reproduction in plants and animals 1,2,3,4,5,6  (to be taught together summer 1)  Local area: Nursing home  Working scientifically -  Key investigations: observation over time, how do we change over the year, |
| Year 6 | ANIMALS including HUMANS  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.  Key Learning:  The heart pumps blood in the blood vessels around to the lungs. Oxygen goes into the blood and carbon  dioxide is removed. The blood goes back to the heart and is then pumped around the body. Nutrients, water and oxygen are transported in the blood to the muscles and other parts of the body where they are needed.  As they are used, they produce carbon dioxide and other waste products. Carbon dioxide is carried by the blood back to the heart and then the cycle starts again as it is transported back to the lungs to be removed from the body. This is the human circulatory system.  Diet, exercise, drugs and lifestyle have an impact on the way our bodies function. They can affect how well out heart and lungs work, how likely we are to suffer from conditions such as diabetes, how clearly we think, and generally how fit and well we feel. Some conditions are caused by deficiencies in our diet e.g. lack of vitamins. This content is also included in PSHE. Look up the new statutory requirements for relationships and health education.  Key Vocabulary:  Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle  Body Pump – 1,2,3,4,5,6  Body Health – 2,3,5,6,7,  Local area: Sports facility - LCCC  Working Scientifically:  Key investigations: sort and classify food groups on basis of impact on body function- what will happen if we eat too much sugar, obs over time- change in heart rate before and after eating and exercise | LIGHT  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.  Key Learning  Light appears to travel in straight lines, and we see objects when light from them goes into our eyes. The light may come directly from light sources, but for other objects  some light must be reflected from the object into our eyes for the object to be seen.  Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape  of the object  Key Vocabulary  As for Year 3 - Light, plus straight lines, light rays  Light up your world 1,2,3,4,5,6,  Working Scientifically  Key investigations: fair test- what happens to shadows as we change the distance from the light source? | ELECTRICITY  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  Key Learning:  Adding more cells to a complete circuit will make a bulb brighter, a motor spin faster or a buzzer make a louder sound. If you use a battery with a higher voltage, the same thing happens. Adding more bulbs to a circuit will make each bulb less bright. Using more motors or buzzers, each motor will spin more slowly and each buzzer will be quieter.  Turning a switch off (open) breaks a circuit so the circuit is not complete and electricity cannot flow. Any bulbs, motors or buzzers will then turn off as well.You can use recognised circuit symbols to draw simple circuit diagrams.  Key Vocabulary:  Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor,  switch, voltage  N.B.  Children do not need to understand what voltage is, but will use volts and voltage to  describe different batteries. The words “cells” and “batteries” are now used  interchangeably.  Danger – Low Voltage  2,3,4,5,6  Working Scientifically: Key investigations: fair test- how can we make brightest bulb/loudest buzzer? | LIVING THINGS AND THEIR HABITATS  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.  • Give reasons for classifying plants and animals based on specific characteristics.  Key Learning:  Living things can be formally grouped according to characteristics. Plants and animals are two main groups but  there are other livings things that do not fit into these groups e.g. micro-organisms such as bacteria and yeast, and toadstools and mushrooms. Plants can make their own food whereas animals cannot.  Animals can be divided into two main groups: those that have backbones (vertebrates); and those that do not (invertebrates). Vertebrates can be divided into five small groups: fish; amphibians; reptiles; birds; and mammals. Each group has common characteristics. Invertebrates can be divided into a number of groups, including insects, spiders, snails and worms.  Plants can be divided broadly into two main groups: flowering plants; and non-flowering plants.  Key Vocabulary:  Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering,  non-flowering  The Nature Library 1,3,4,6,8,9  Working Scientifically:  Key investigations: sort and classify living things on basis of characteristics, pattern seeking of mammal group- what observable characteristics are there? Obs over time- mould growing on bread, oranges, | RHE After SATs | EVOLUTION and INHERITANCE  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  Key Learning:  All living things have offspring of the same kind, as features in the offspring are inherited from the parents.  Due to sexual reproduction, the offspring are not identical to their parents and vary from each other.  Plants and animals have characteristics that make them suited (adapted) to their environment. If the  environment changes rapidly, some variations of a species may not suit the new environment and will die. If  the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited  characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is  evolution.  Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the  theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.  Key Vocabulary:  Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils  Danger – Low Voltage  2,3,4,5,6  Working Scientifically:  Key investigations: fair test- how can we make brightest bulb/loudest buzzer? |