PROGRESSION OF SKILLS AND KNOWLEDGE

CHERRY TREE PRIMARY SCHOOL

SUBJECT - Science

Year	Substantive Knowledge	Disciplinary Knowledge	Vocabulary
EYFS	• Five senses – sense each week linked with story book about seasons, weekly welly walks • Forest School sessions – changes in school environment • Changes in materials – cooking/baking, ice melting, Mentos expt • Life cycles and Minibeasts – chick eggs watching them hatch, tadpoles • Living Things – planting beans, wildlife area, bird watching **Online learning journal Tapestry consisting of photos of chn's wk, chn's voice, moments from home **Theme Folders	**See EYFS Working Scientifically skills wheel.** • Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. • Can talk about some of the things they have observed such as plants, animals, natural and found objects. • Talks about why things happen and how things work. • Developing an understanding of growth, decay and changes over time. • Shows care and concern for living things and the environment. • To look closely at similarities, differences, patterns and change. **ELG** To know about similarities and differences in relation to places, objects, materials and living things. To talk about the features of their own immediate environment and how environments might vary from one another.	Root, stem, tree, leaf, flower, water, seed, plant Animal, head, legs, arms, knee, elbow, neck, face, feet, hands, bread, potatoes, apples, cereals, rice, meat, fish, milk, running, jumping, swimming, walking, chicken, hen, kitten, cat, puppy, dog, duckling, duck Push, pull, twist, squash, stretch Battery, electricity, switch
Year 1	**Plants** • identify and describe the basic structure of a variety of common flowering plants, incl. trees • identify and name a variety of common wild and garden plants, incl. deciduous and evergreen trees **Animals incl. humans: Different Animals** • identify and name a variety of common animals including fish, amphibians, reptiles, birds & mammals • identify and name a variety of common animals that are carnivores, herbivores & omnivores • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, mammals incl. pets) **Living Things & their habitats: Weather & Seasonal changes** • Observe changes across the four seasons • Observe and described weather associated with the seasons and how day length varies **Materials** • distinguish between an object & the material from which it is made • identify and name a variety of everyday materials incl wood, plastic, glass, metal, rock, water • describe the simple physical properties of variety of everyday materials	**See KS1 WS wheel** • Curiosity – raise their own simple questions • Experience diff. types of scientific enquiries incl. practical activities • Begin to recognise diff. ways in which might answer scientific questions • Carry out simple tests • Make comparisons & with help, decide how to sort and group objects, materials & living things • Ask people questions and use secondary sources to find answers • Observing closely using simple equipment; with help, observe changes over time • With guidance, begin to notice patterns & relationships • Use simple measurements & equipment e.g. hand lenses, egg timers to gather data • Use observations & ideas to suggest answers to questions • Talk about what found out & how found it out • With help, record & communicate findings in range of ways & begin to use simple scientific language	petal, tall, taller, tallest, wild, trunk, similar, different, within, under, next to, soil, blossom, fruit, leaves, branch, bulbs, shrub, alive, vegetables, grass, garden, habitat, deciduous, earth, evergreen, compost, non-living, living, not alive, dead, artificial Names e.g. daffodil, daisy, sunflower, rose, lavender, tulip, snowdrop, holly, dandelion, oak, beech, chestnut, pine Seasons: Autumn, Spring, Summer, Winter, deciduous, evergreen, shoot, fruit, earth, seeds, leaves, flowers, weather types: rain, hail, snow, ice, frost, sun, showers, wind, reproduce, babies/adults, life cycles, birds, insects, cold, warm, hot, sunrise, sunset

	compare and group together a variety of everyday materials on the basis of their simple physical properties.		Body parts: eyes, ears, elbows, hair, mouth, nose, teeth, paw, hoof, tail, fin, shell, skin, wings, beak, fur, scales, feathers Fish: goldfish, tuna, salmon Birds: blackbird, magpie, robin, sparrow, crow, swan. Reptiles: snake, lizard, tortoise Mammals: mouse, horse, cow, sheep, hamster, rabbit Amphibians: frog, toad, newt Senses: feel, hear, smell, see, taste, touch Carnivore, omnivore, herbivore Hard, stiff, rough, not bendy, opaque, strong, soft, shiny, smooth, waterproof, stretchy, material, transparent, dull, bendy, absorbent, wood, plastic, glass, magnetic, elastic, fabric, metal, water, rock,
Year 2	**Plants** • Observe and grow seeds and bulbs grow into mature plants • Find out and describe how plants need water, light and a suitable temp. to grow and stay healthy **Animals incl. humans: Growth & Survival** • Notice that animals, incl. humans, have offspring which grow into adults • Find out about and describe basic needs of animals, incl. humans, for survival (water, food and air) • Describe the importance for humans to exercise, eating the right amounts of different types of food, and hygiene **Living things & their habitats** • Identify and name variety of plants & animals in their habitats, incl. micro-habitats • Explore & compare diffs between things that are living. dead, and things that have never been alive Describe how animals obtain their food from plants & animals, using the idea of a simple food chain, and identify and name diff. sources of food **Materials and suitability/uses** • Identify and compare suitability of a variety of everyday materials, incl. wood, metal, plastic, brick, rock, paper & cardboard for partic. Uses • Find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting & stretching	**See KS1 WS wheel** • Curiosity – raise their own simple questions • Experience diff. types of scientific enquiries incl. practical activities • Begin to recognise diff. ways in which might answer scientific questions • Carry out simple tests • Make comparisons & with help, decide how to sort and group objects, materials & living things • Ask people questions and use secondary sources to find answers • Observing closely using simple equipment; with help, observe changes over time • With guidance, begin to notice patterns & relationships • Use simple measurements & equipment e.g hand lenses, egg timers to gather data • Use observations & ideas to suggest answers to questions • Talk about what found out & how found it out • With help, record & communicate findings in range of ways & begin to use simple scientific language	seedling, bulb, buds, shoot, water, sun light, seeds, nuts, fruit stones, warm, grow, temperature, germinate Baby, toddler, adult, eggs, fruit, vegetables, water, fibre, meat, fish, cheese, beans washing, exercise, diet offspring Dead, alive, living, non-living, habitats, keys, breathe, grow, eat, have babies, move, sense, go to the toilet, habitat, microhabitat, food chain Brick, cardboard, transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend
Year 3	**Plants** • Identify & describe functions of diff. parts of flowering plants: roots, stem/trunk, leaves & flowers • Explore requirements of plants for life & growth & how the vary from plant to plant • Investigate the way water is transported within plants • Explore the part that plants play in life cycle of flowering plants, incl. pollination, seed formation & seed dispersal **Animals incl. Humans (Healthy Eating & Bodies)**	**See LKS2 WS wheel** • Curiosity – raise own relevant questions about world around them • Range of scientific experiences incl. diff. types of science enquiries to answer questions • Start to make own decisions about most approp. type of scientific enquiry might use to answer questions • Set up simple practical enquires, comparative & fair tests	Ground, transport, attract bees, catch sunshine, green, air, nutrients, growth, pollen, pollination, seed formation, seed dispersal, nutrition, support, anchor, reproduction Balanced diet, carbohydrates, protein, fats, fibre, fruit and vegetables, bones, muscles, femur, ribs, spine,

	• Identify that animals, incl. humans need the right types & amounts of nutrition, & that they cannot make their own food; they get their nutrition from what they eat Identify that humans and some other animals have skeletons and muscles for support, protection & movement **Materials: Rocks, Fossils & Soil** • Compare and group together diff. kinds of rocks on 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 other organic matter **Light and shadows** • Recognise that light from the sun can be dangerous and that there are ways to protect eyes • Recognise that the need light in order to see things and that dark is the absence of light • Notice that light is reflected from surfaces • Recognise that shadows are formed when light from a light source is blocked by a solid object • Find patterns in the way that the size of shadows change **Forces and magnets** • Compare how things move on diff. surfaces • Observe how magnets attract or repel each other and attract some materials and not others • Predict whether 2 magnets will attract/repel, depending on which way the poles are facing	• With help, recognise when a simple fair test is necessary & help decide how to set it up • Discuss criteria for grouping, sorting & classifying; use simple keys • Recognise when & how sec. sources might help answer questions • Make systematic & careful observations • Begin to look for naturally occurring patterns & relationships & decide what data to collect to identify them • Take accurate measurements using std units e.g. thermometers • Collect & record data in variety of ways e.g. notes, labelled diagrams, bar graphs & tables, keys • With help, look for changes, patterns, sims & diffs in data to begin to draw simple conclusions & answer questions • Use relevant scientific language to discuss ideas & communicate results & conclusions approp. for diff. audiences incl. oral/written explanations, displays/ presentations • With support, identify new questions arising from data, make predictions & find ways to improve	tibia, shoulder blade, hollow, relax and contract, protect, support, internal skeleton, exoskeleton Rock, soil, marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crystal, grains, crumbly, igneous, sedimentary, metamorphic, fossil, Shadow, light, flames, opaque, block, direction, light, travels, shortest, longest, highest, torch, shape, similar, transparent, translucent, light source, sun, object daytime, night-time, reflect, shine, shiny, absorb, reflective surface, surface, mirror, sundial, block, lamp Force, push, pull, speed up, slow down, change shape, change direction, movement, direction, friction, magnets, magnetic, surface, magnetism, north pole, south pole, repel, attract,
Year 4	**Animals incl. humans: Digestion and Teeth** • 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 **Living Things and their habitats: Classification & Interdependence** • Recognise that living things can be grouped in a variety of ways • Explore & use classification keys to help group, identify and name a variety of living things in their local and wider environment • Construct & interpret a variety of food chains, identifying producers, predators & prey • Recognise that environments can change and that this can sometimes pose dangers to living things **Materials: States of matter** • Compare & group materials tog., 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 temp. at which this happens in degrees Celsius • Identify the part played by evaporation & condensation in water cycle & associate the rate of evaporation with temp. **Sound** • Recognise how sounds are made, associating some of them with something vibrating • Recognise that vibrations from sounds travel through a medium to ear	**See LKS2 WS wheel** • Curiosity – raise own relevant questions about world around them • Range of scientific experiences incl. diff. types of science enquiries to answer questions • Start to make own decisions about most approp. type of scientific enquiry might use to answer questions • With support, set up simple practical enquires, comparative & fair tests • With help, recognise when a simple fair test is necessary & help decide how to set it up • Discuss criteria for grouping, sorting & classifying; use simple keys • Recognise when & how sec. sources might help answer questions • Make systematic & careful observations • Begin to look for naturally occurring patterns & relationships & decide what data to collect to identify them • Take accurate measurements using std units e.g. thermometers • Collect & record data in variety of ways e.g. notes, labelled diagrams, bar graphs & tables, keys • With help, look for changes, patterns, sims & diffs in data to begin to draw simple conclusions & answer questions • Use relevant scientific language to discuss ideas & communicate results & conclusions approp. for diff.	Teeth and eating: incisor, molar, canine, diet, decay, healthy, teeth, acids, sugars, mouth, rip, tear, chew, grind Digestive system: saliva, tongue, toilet waste, nutrients, energy, stomach, large/small intestine, brain, lungs, movement, acids, urine, faeces, oesophagus Predator, prey, producer, river, ocean, desert, arctic, rainforest, mountain, farmland, wood, dry, wet, vegetation, shelter, vertebrate, invertebrate, classify, characteristic, flowering plant, non- flowering plant (fern, moss) Water, air, ice, milk, lemonade, juice, metal, solid, liquid, gas, pour, flow, change shape, squash, heat, cool, grain/granular, temperature, thermometer, freeze, melt, boil, evaporate, condense, steam, smoke, sea water, properties, melting point, degrees Celsius,

	• Find patterns between pitch of sound & features of object that produced it • Find patterns between volume of sound & strength of volume that produced it • Recognise that sounds get fainter as distance from sound source increases **Electricity** • Identify common appliance that run on electricity • Construct a simple series circuit, identifying and naming its basic components incl. cells, buzzers, switch, bulbs, wires • Identify whether or not a lamp will light in simple series circuit, based on whether it is part of a complete circuit • Recognise that a switch opens & closes a circuit & associate this with whether or not lamp lights in simple series circuit • Recognise some common conductors & insulators, & associate metals with being good conductors	audiences incl. oral/written explanations, displays/ presentations • With support, identify new questions arising from data, make predictions & find ways to improve	Sound, pitch, volume, vibrations, medium, insulation, travel, instrument Battery, cell, wires, switch, crocodile clips, buzzer, bulb, circuit, symbols, insulator, conductor, plastic, metal, appliance, component
Year 5	**Animals incl. humans: Human Life cycles** • Describe the changes as humans develop to old age **Life Cycles** • Describe the differences in life cycle of mammal, an amphibian, an insect and a bird • Describe the process of reproduction in some plants and animals **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 • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • 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 • 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 **Earth and space** • 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 **Forces** • identify the effects of air resistance, water resistance and friction, that act between moving surfaces	**See UKS2 WS wheel** • Use science experiences to explore ideas & raise diff. kinds of questions • Talk about how scientific ideas have developed over time • Select & plan the most appropriate type of scientific enquiry to answer questions • Recognise when * how to set up comparative & fair tests – explain which variables need to be controlled etc • Use & develop keys & other information records to identify, classify & describe living things & materials; identify pattern that might be found in natural environment • Recognise which sec. sources will be most useful to research their ideas; begin to separate opinion from fact • Make own decisions about what observations to make & how long to make them • Look for diff. causal relationships in data & identify evidence that supports/refutes ideas • Choose most approp. equipment to make measurements with increasing accuracy; repeat measurements where approp. • Decide how to record data and results of increasing complexity • Identify scientific evidence that has been used to support/refute ideas/arguments • Use relevant scientific language and illustrations to discuss, communicate & justify scientific ideas • Use results to make predictions& identify when further observations/.tests might be needed	New born, infant, child, teenager, puberty, adult, wrinkles, grey hair, height, weight Live young, hatch, tadpole, caterpillar, butterfly, ladybird, pupae, larvae, chrysalis, reproduction, asexual, sexual, life cycle, pollination, seed dispersal, pollen, stamen, stigma Hardness, solubility, transparency, conductivity, thermal, insulation, dissolve, solution, separation, polymers, reversible, irreversible, evaporating, melting, evaporation, filtering, sieving, , dissolving, burning, rusting, vinegar, bicarbonate of soda, magnetism, insulators, conductors, soluble, insoluble Earth, Sun, planet, Mercury, Venus, Mars, Jupiter, Moon, Saturn, Uranus, Neptune, solar system, spherical, moon, day and night, celestial body, rotation, hemisphere, orbit, gravity, shadow, daylight force, air resistance, water resistance, magnetic attraction, gravitational attraction, direction, force, motion, weight, upthrust, Newton, forcemeter, stationary, surface area, force applied, pulley, lever, gear

	• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect		
Year 6	**Animals incl. human: Humans and Health** • 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 **Living Things and their habitats: Classification** • 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 **Evolution & Inheritance** • 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 • recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago **Light** • recognise that light appears to travel in straight lines • 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 that objects are seen because they give out or reflect light into the eye • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them **Electricity** • 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	**See UKS2 WS wheel** • Use science experiences to explore ideas & raise diff. kinds of questions • Talk about how scientific ideas have developed over time • Select & plan the most appropriate type of scientific enquiry to answer questions • Recognise when & how to set up comparative & fair tests – explain which variables need to be controlled etc • Use & develop keys & other information records to identify, classify & describe living things & materials; identify pattern that might be found in natural environment • Recognise which sec. sources will be most useful to research their ideas; begin to separate opinion from fact • Make own decisions about what observations to make & how long to make them • Look for diff. causal relationships in data & identify evidence that supports/refutes ideas • Choose most approp. equipment to make measurements with increasing accuracy; repeat measurements where approp. • Decide how to record data and results of increasing complexity • Identify scientific evidence that has been used to support/refute ideas/arguments • Use relevant scientific language and illustrations to discuss, communicate & justify scientific ideas • Use results to make predictions& identify when further observations/.tests might be needed	Heart, veins, arteries, capillaries, blood, pulse, beats, oxygen, carbon dioxide nutrients, organs, drugs, medicines, minerals, vitamins, lungs, caffeine, medical, legal, illegal Micro-organism, microbe, fungus, bacteria, virus, classified, classification key, yeast, characteristic, microscope Variety, variation, offspring, species, competition, adapt, adaptation, reproduce, survive, evolve, fossil record, gills, blubber, moulting, long neck, hooves, eyelashes, tails, generation Reflection, transparent, translucent, opaque, periscope, luminous, non-luminous, absorb, direction Voltage, current, series, component, circuit, conductor, positive/negative terminal, complete circuit, battery, cell