Wistow Parochial Primary School
Science - Progression of Skills and Vocabulary

Disciplinary Knowledge Progression - Working Scienctifically

	EYFS	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2
Ask scientific questions	•Begin to ask questions about the world around them	• Ask a yes/no questions to aid sorting. • Ask one/two simple research questions linked to a topic. • Choose a question to undertake a fair test. • Ask a question about what might happen over time or that is looking for a pattern.	• Ask a yes/no questions to aid sorting. • Ask one/two simple research questions linked to a topic. • Choose a question to undertake a fair test. • Ask a question about what might happen over time or that is looking for a pattern.	• Ask a range of Yes/No questions to aid sorting and decide which ways of sorting will give useful information. • Ask a range of questions recognising that some can be answered through research and others may not • Ask a range of questions and identify the type of enquiry that will help to answer the questions. Ask further questions based on results.
Plan an enquiry		•Identify the headings for the two classification groups (it is …., it is not ….) •Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.	•Put appropriate headings onto intersecting Venn and Carroll diagrams. •Choose a research source from a range provided •Decide what to change and what to measure or observe •Decide how often to take a measurement.	•Identify specific clear questions that will help to sort without ambiguity •Choose suitable sources to use •Recognise and independently control variables where necessary •Decide how often to take a measurement.
To observe closely	•Explore the natural world around them, making observations and drawing pictures of animals and plants.	• Compare objects based on obvious, observable features e.g. size, shape, colour, texture etc. • Make observations linked to answering the question.	•Compare objects based on more sophisticated, observable features and present observations in labelled diagrams. • Make a range of relevant observations linked to the question.	•Compare not only based on physical properties but also on knowledge gained through previous enquiry. • Make a range of relevant observations linked to the question.
To take measurements		• When appropriate, measure using standard units where all the numbers are marked on the scale. .	• Measure using standard units (according to age-related mathematics) where not all the numbers are marked on the scale, and take repeat readings where necessary • Use dataloggers to measure over time	• Measure using standard units using equipment that has scales involving decimals (according to age-related mathematics), and take repeat readings where necessary. • Use dataloggers to measure over time.
To record results	•Record observations pictorially/photographs	•Record data in simple prepared tables, tally charts, pictorially or by taking photographs.	•Prepare own tables to record data.	•Prepare own tables to record data, including columns for taking repeat readings
To present results		•Sort objects and living things into two group using a basic Venn diagram or simple table, • Present what they have learnt verbally, using pictures or block diagrams.	•Sort objects and living things into groups using intersecting Venn and Carroll diagrams • Present what they learnt verbally or using labelled diagrams, bar charts, or time graphs.	•Create branching databases (tree diagrams) and keys to enable others to name livings things and objects • Present what they learnt in a range of ways e.g. different graphic organisers, line graphs and scatter graphs.

To interpret results		•Talk about the number of objects in each classification group i.e. which has more or less. • Answer their questions using simple sentences using their observations or measurements.	•Spot patterns in the classification data, particularly two criteria with no examples - e.g. there are no living things with wings and no legs •Answer questions using simple scientific language and refer directly to their evidence when answering their question	•Talk about the features that items share and do not share based on the information in the key etc. • Answer questions using scientific evidence gained from a range of sources. Describe causal relationships, change over time and identify patterns.
To draw conclusions			•Draw simple conclusions, when appropriate, for patterns - e.g. a flying insect with no legs might always crash land. • Where appropriate provide oral or written explanations for their findings.	•Use data to show that items grouped together have more things in common than with things in other groups • Provide detailed oral or written explanations for their findings.
To make a prediction			•Use results from an investigation to make a prediction about a further result.	•Use test results to make predictions for further investigations.
To evaluate an enquiry			• Suggest improvement (e.g. a wider range of objects) and suggest new questions arising from the investigation. • Suggest limitations to research (e.g. only had one book) and suggest new questions arising from the investigation. • Suggest improvements (e.g. measurement method) and suggest new questions arising from the investigation.	•Explain using evidence that the branching database or classification key will only work for the living things or materials it was created for. • Talk about their degree of trust in the sources they used. • Explain their degree of trust in their results (e.g. precision in measurements, variables that may not have been controlled, and accuracy of results.

Susbstantive Knowledge Progression

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including Humans	• Identify changes from a baby • To name body parts • To know why exercise is important for our bodies • To know why healthy eating is important to for our bodies • To understand why oral hygiene is important • To explore the 5 senses • To know animal's live in different countries and habitats	• 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	• 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.	• 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.	• 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.	• describe the changes as humans develop to old age.	• 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.

	• to observe and comment on the life cycle of an animal	mammals including pets); • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.					
Plants	• to observe and comment on the life cycle of a plant	• 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.	• 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.	• 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.			
Living Things and their Habitats	• to know that animals live in different habitats • to recognise changes in 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		• 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	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird; • describe the life process of	• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences,

			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 microhabitats; • describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.		of living things in their local and wider environment; • recognise that environments can change and that this can sometimes pose dangers to living things.	reproduction in some plants and animals.	including micro-organisms, plants and animals; • give reasons for classifying plants and animals based on specific characteristics.
Evolution and Inheritence	• to know that dinosaurs lived a long time ago and that fossils provide information about creatures						• 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.
Seasonal Changes	• observe changes across the 4 seasons; • observe and describe weather associated with the seasons	• observe changes across the 4 seasons; • observe and describe weather associated with the seasons and how day length varies.					
Forces				• compare how things move on different surfaces; • notice that some forces need contact between 2 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 2 poles; • predict whether 2 magnets will attract or repel each other, depending on which poles are facing.		• 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.	

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			• 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.
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.		
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.	
Electricity					• 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;		• 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

					• 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.		representing a simple circuit in a diagram.
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.	• 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.	• 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	• 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.	• 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; • 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.	

Vocabulary

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including Humans	• Human body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet • Human senses: sight, hearing, touch, smell, taste. • Human health: exercise, heart, blood, oral, hygiene, teeth, decay, cavities, food, healthy, • Animal life cycle: life cycle, metamorphosis, puppa, larva, chrysalis, butterfly	• Names of animal groups: **fish, amphibians, reptiles, birds, mammals.** • Animal diets: **carnivore, herbivore, omnivore.** • Human and animal body parts: e.g. body, head, neck, arms, elbows, legs, knees, face, ears, eyes, nose, hair, mouth, teeth, hands, feet, tail, wings, feathers, fur, beak, fins, gills. • Human senses: **sight, hearing, touch, smell, taste.** • Exploring senses: loud, quiet, soft, rough. • Other: human, animal, pet.	• Being born and growing: **Young, offspring, live young**, grow, **develop**, change, hatch, lay, fly, crawl, talk. • Young and adult names: e.g. lamb and sheep, kitten and cat, duckling and duck. • **Life cycle** stages: e.g. baby, toddler, child, teenager, **adult;** frogspawn, tadpole, froglet, frog. • Survival and staying healthy: basic needs, survive, food, air, **exercise, diet, nutrition**, healthy, balanced diet, **hygiene, germs.** • Food groups: fruit and vegetables, proteins, dairy and alternatives, carbohydrates, oil and spreads, fat, salt, sugar.	• Food groups and **nutrients**: fibre, fats **(saturated and unsaturated**), vitamins, minerals. • Skeletons and muscles: skeleton, **muscles, tendons, joints,** protection, support, organs, voluntary muscles, involuntary muscles, biceps, triceps, contract, relax, bone, cartilage, shell, **vertebrate, invertebrate,** endoskeleton, exoskeleton, hydrostatic skeleton. • Names of human bones: e.g. skull, spine, backbone, vertebral column, ribcage, pelvis, clavicle, scapula, humerus, ulna, pelvis, radius, femur, tibia, fibula. • Other: **energy**.	• Digestive system: **digest**, digestion, tongue, teeth, saliva, salivary glands, **oesophagus, stomach,** liver, pancreas, gall bladder, **small intestine,** duodenum**, large intestine, rectum,** anus, faeces, organ. • Types of teeth and dental care: **molar**, **premolar**, **incisor**, **canine**, wisdom teeth, tooth decay, plaque, enamel, baby (milk) teeth. • Food chains and animal diets: decomposer, food web.	• Process of reproduction: **gestation, asexual reproduction, sexual reproduction,** sperm, egg, cells, clone. • Changes and **life cycle:** embryo, foetus, uterus, **prenatal, adolescence, puberty, menstruation, adulthood,** menopause, **life expectancy,** old age, hormones, sweat. • Changing body parts: e.g. breasts, penis, larynx, ovaries, genitalia, pubic hair.	• **Circulatory system**: circulation, **heart**, pulse, heartbeat, heart rate, lungs, breathing, **blood vessels**, blood, pump, transported, **oxygenated blood, deoxygenated blood,** oxygen, arteries, veins, capillaries, chambers, plasma, platelets, white blood cells, red blood cells. • Lifestyle: **drug, alcohol,** smoking, disease, calorie, energy input, energy output. • Other: water transportation, nutrient transportation, waste products.
Plants	• Life cycle of a plant: Life cycle, seed, shoot, stem, leaves, bud, flower, growing	• Names of common plants: **wild plant, garden plant, evergreen** tree, **deciduous** tree, common flowering plant, **weed,** grass. • Name some features of plants: e.g. **flower**, vegetable, **fruit**, berry, **leaf/leaves**, blossom, **petal**, **stem**,	• Growth of plants: **germination**, **shoot, seed dispersal,** grow, food store, life cycle, die, wilt, seedling, sapling. • Needs of plants: **sunlight, nutrition,** light, healthy, space, air.	• Water transportation: transport, **evaporation, evaporate, nutrients,** absorb, anchor. • Life cycle of flowering plants: **pollination** (insect/wind), pollen, nectar, pollinator, seed formation, **seed dispersal**			

		trunk, branch, **root**, **seed, bulb,** soil. • Name some common types of plant e.g. sunflower, daffodil.	• Name different types of plant: e.g. bean plant, cactus. • Names of different habitats: e.g. rainforest, desert.	(animal/wind/water), reproduce, **fertilisation,** fertilise, **stamen,** anther, filament, **carpel (pistil),** stigma, style, ovary, ovule, **sepal**, carbon dioxide			
Living Things and their Habitats	• Habitats: Habitats, desert, rainforest, mountains, grasslands, oceans, humid, hot, freezing, rocky		• Living or dead**: living, dead, never living,** not living, alive, never been alive, healthy. • **Habitats** including **microhabitats**: **depend,** shelter, safety, **survive**, suited, space, minibeast, air. • **Life processes:** movement, sensitivity, growth, reproduction, nutrition, excretion, respiration. • **Food chains: food sources,** food, producer, consumer, predator, prey. • Names of habitats and microhabitats: e.g. under leaves, woodland, rainforest, sea shore, ocean, urban, local habitat.		• Living things: **organisms, specimen,** species. • Grouping living things: **classification,** classification keys, classify, **characteristics**. • Names of invertebrate animals: snails and slugs, worms, spiders, insects. • Invertebrate body parts: e.g. wing case, abdomen, thorax, antenna, segments, mandible, proboscis, prolegs. • Environmental changes: **environment,** environmental dangers, adapt, natural changes, climate change, deforestation, pollution, urbanisation, invasive species, **endangered species, extinct.**	• **Reproduction**: **asexual reproduction, sexual reproduction**, **gestation, metamorphosis,** gametes, tuber, runners/side branches, plantlet, cuttings, embryo, adolescent, penis, vagina, egg, pregnancy, gestation.	• Classifying: Carl Linnaeus, Linnaean system, flowering and non-flowering plants, variation. • **Microorganisms**: **bacteria,** single-celled, microbes, microscopic, virus, fungi, fungus, mould, antibiotic, yeast, ferment, **microscope**, decompose.
Evolution and Inheritence	• Dinosaurs: herbivores, omnivores, carnivores, fossils, millions, years						• **Evolution** and **inheritance:** evolve, **adaptation,** inherit, **natural selection, adaptive traits, inherited traits,** mutations, theory of

							evolution, ancestors, biological parent, chromosomes, genes, Charles Darwin. Other: selective breeding, artificial selection, breed, cross breeding, genetically modified food, cloning, DNA
Seasonal Changes	• **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind.	• **Seasons**: **spring, summer, autumn, winter**, seasonal change. • **Weather**: e.g. sun, rain, snow, sleet, frost, ice, fog, cloud, hot/warm, cold, storm, wind, thunder, weather forecast. • Measuring weather: temperature, rainfall, wind direction, thermometer, rain gauge. • Day length: night, day, **daylight.**					
Forces				• How things move: move, movement, **surface**, distance, strength. • Types of **forces**: push, pull, contact force, non-contact force, **friction**. • **Magnets: magnetic, magnetic field,** magnetic force, bar magnet, horseshoe magnet, ring magnet, magnetic **poles** (north pole, south pole), **attract, repel,** compass. • Magnetic and non-magnetic materials:		• Types of forces: **air resistance, water resistance, buoyancy, upthrust,** Earth's **gravitational pull, gravity**, opposing forces, driving force. • **Mechanisms:** levers, pulleys, gears/cogs. • Measurements: **weight, mass,** kilograms (kg), Newtons (N), scales, speed, fast, slow. • Other: **streamlined**, Earth.	

				e.g. iron, nickel, cobalt.			
Light				• **Light** and seeing: **dark,** absence of light, **light source,** illuminate, visible, **shadow, translucent,** energy, block. • **Light sources:** e.g. candle, torch, fire, lantern, lightning. • **Reflective light: reflect, reflection,** surface, **ray**, scatter, reverse, beam, angle, mirror, moon. • Sun safety: dangerous, glare, damage, UV light, UV rating, sunglasses, direct.			• Reflection: periscope. • Seeing light: **visible spectrum, prism.** • How light travels: light waves, wavelength, straight line, **refraction.**
Sound					• Parts of the **ear**: **eardrum.** • Making sound: **vibration,** vocal cords, **particles.** • Measuring sound: **pitch**, **volume, amplitude, sound wave,** quiet, loud, high, low, travel**, distance.** • Other: **soundproof, absorb sound.**		
Earth and Space						• Solar system: **star, planet.** • Names of planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Neptune, Uranus.	

						• Shape: **spherical bodies, sphere.** • Movement: **rotate, axis, orbit, satellite.** • Theories: **geocentric model, heliocentric model, astronomer.** • Day length: sunrise, sunset, midday, time zone.	
Electricity					• **Electricity:** mains-powered, battery-powered, **mains electricity,** plug, **appliances**, devices. • Circuits: **circuit,** simple series circuit, complete circuit, incomplete circuit. • Circuit parts: bulb, cell, wire, buzzer, switch, motor, **battery.** • Materials: **electrical conductor, electrical insulator.** • Other: safety.		• Flow and measure of electricity: **voltage, amps, resistance, electrons**, volts (V), **current.** • Circuits**: symbol,** circuit diagram, component, function, filament. • Variations: dimmer, brighter, louder, quieter. • Types of electricity: natural electricity, human-made electricity, solar panels, power station. • Other: positive, negative.
Materials		• Names of **materials**: wood, plastic, glass, metal, water, rock, paper, cardboard, rubber, fabric. • Properties of materials: **hard, soft, shiny, dull, stretchy**, **rough**, **smooth, bendy, not bendy, transparent, opaque, waterproof, not waterproof**, **absorbent, not absorbent,** sharp, stiff. • Other: **object.**	• Changing shape: squash, bend, twist, stretch. • **Properties** of **materials:** e.g. strong, flexible, light, hard-wearing, elastic. • Other: **suitability**, recycle, pollution.	• Types of rock**: sedimentary rock, igneous rock, metamorphic rock.** • **Properties of rocks: permeable,** semi-permeable, **impermeable,** durable. • Names of rocks: e.g. marble, chalk, granite, sandstone, slate. • Formation of rocks and fossils: natural, human-made, **magma, lava,** molten	• **States of matter: solids, liquids, gases,** particles. • State change: **evaporate, condense, melt, freeze**, heat, cool, melting point, freezing point, boiling point, **water vapour**. • Water cycle: **precipitation**, evaporation, condensation, ground run-off, collection,	• Properties of **materials**: thermal **conductor/insulator,** magnetism, electrical resistance, **transparency**. • Mixtures and solutions: dissolving, substance, soluble, insoluble. • Changes of materials: reversible change, physical change, irreversible change, chemical change,	

				rock, **sediment, erosion, fossilisation,** layers, bone, fossil. • <u>Soil:</u> sandy, chalky, clay, peaty, loamy, topsoil, subsoil, bedrock, mineral, organic matter, compost. <u>Other:</u> **palaeontology.**	underground water, bodies of water (sea, river, stream), water droplets, hail. <u>Other:</u> atmosphere.	burning, new material, product. • <u>Separating</u>: sieving, filtering, magnetic attraction.	