

St Gerard's Catholic Primary and Nursery

Science Progression Overview 2021-2022

	Foundation	KS1		Lower KS2		Upper KS2	
	EYFS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Progression Aims	<ul style="list-style-type: none"> To be able to understand and talk about personal health and hygiene. To recognise materials and living things making observations about plants and animals. To explain why some things occur and talk about changes. 	<ul style="list-style-type: none"> Observe natural and humanly-constructed world. With help, answer questions about scientific ideas by observing changes, noticing patterns, grouping and classifying and carrying out simple comparative tests. To show an understanding of a concept using simple scientific vocabulary. To begin to apply knowledge independently in familiar related contexts with a range of simple enquiries. 	<ul style="list-style-type: none"> Closely observe natural and human world around them. Be curious and ask own questions about what they notice. Answer own questions by observing, noticing patterns, grouping and classifying and carrying out simple comparative tests, use secondary sources. To show an understanding of a widening range of scientific vocabulary with accuracy. To independently apply knowledge in familiar related contexts including a range of different investigation and enquiries. Talk about and begin to write about what they have noticed. 	<ul style="list-style-type: none"> Enable pupils to broaden their scientific view of the world around them. Explore, talk about, test and develop ideas about everyday phenomena and relationships between living things and familiar environments. Develop ideas about functions, relationships and interactions. Ask their own questions about what they observe, make decisions about which types of enquiry will answer them best (observe changes over time, notice patterns, group and classify, simple comparative tests and fair tests, secondary sources). Draw simple conclusions using some scientific language first to talk about and later to write about findings. Read and spell scientific vocab with confidence. 		<ul style="list-style-type: none"> Develop a deeper understanding of a wide range of scientific ideas through exploring and talking about their ideas, asking own questions about scientific phenomena, analysing functions, relationships and interactions systematically. Encounter abstract ideas and begin to recognise how these ideas help them to understand and predict how the world operates. Recognise that scientific ideas change and develop over time. Select appropriate ways to answer questions e.g. observation, noticing patterns, grouping and classifying, comparative and fair tests and secondary sources. Draw conclusions based on data and observations. Use evidence to justify their ideas and scientific knowledge to understand their findings. Spell, read and pronounce scientific vocabulary with confidence accuracy. Build a sufficient understanding of science to engage meaningfully in more sophisticated discussion when leaving our school and moving in to KS3. 	

Scientific Enquiry

<ul style="list-style-type: none"> Show curiosity about objects, events and people. Question why things happen. Take a risk, engage in new experiences. Develop ideas of grouping, sequences, cause and effect. Find ways to solve problems, new ways to do things. Comment and ask questions about familiar world. Choose and use resources. Answer how and why questions. Connect ideas and events. Develop own narratives and explanations. 	<ul style="list-style-type: none"> Explore world around them and raise their own simple questions. Experience different types of science enquiries including practical activities. Begin to recognise different ways in which they might answer scientific questions. Carry out simple tests. Use simple features to compare objects, materials and living things with help, decide how to sort and group them (identifying and classifying) Ask questions and use simple secondary sources to find answers. Observe closely, use simple equipment and with help observe changes over time. With guidance, notice patterns and relationships. Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data. Record simple data. Use observations/ideas to suggest answers to questions, talk about what they have found out and how they found it out. With help, record and communicate their finding in a range of ways and being to use simple scientific language. 	<ul style="list-style-type: none"> Raise own relevant questions about world. Range of experiences/different science enquiries to answer questions. Make own decisions about most appropriate enquiry to answer questions. Set up simple practical enquiries/comparative fair tests. Recognise when a fair test is necessary and decide how to set it up. Talk about criteria for grouping, sorting, classifying: use simple keys. Recognise when/how secondary sources are helpful to answer questions. Make systematic, careful observations. Begin to look for naturally occurring patterns/relationships Take accurate measurements using standard units using new equipment (e.g. data loggers, thermometers) Collect/record data from observations and measurements in a variety of ways (notes, bar charts, tables, standard units, drawings, labelled diagrams, keys) With help, look for changes, patterns, similarities/differences in data to draw simple conclusions/answer questions. Use relevant scientific language to discuss and communicate findings and ideas both orally and in written form. With support, identify new questions arising from data, make prediction for new values within or beyond, improve what they have already done. 	<ul style="list-style-type: none"> Use science experiences to explore ideas and raise different questions. Talk about scientific ideas developed over time. Select and plan the most appropriate scientific enquiry to answer questions. Recognise when and how to set up comparative and fair tests and explain which variables must be controlled/why. Use and develop keys and other information records to identify, classify and describe living things/materials. Identify naturally occurring patterns. Recognise the usefulness of secondary sources, separate opinion from fact. Make own decision about what observations to make, what measurements to use and how long for. Look for causal relationships in data and identify evidence that refutes or supports ideas. Choose appropriate measuring equipment for precision and explain how to use it accurately. Take repeat measurements. Record data of results of increasing complexity (scientific diagrams and labels, classification keys, scatter/bar/line graphs). Identify scientific evidence to support/refute ideas. Use relevant scientific language and illustration to discuss, communicate and justify ideas. Use both oral and written forms to report conclusions. Use results to make predictions and identify when further obs/testing might be needed.
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	<p>Health and hygiene – names of body parts, toilet, clean, soap, water, toothpaste, germs, dirty, diet, exercise, heart.</p> <p>Natural World - Names of animals, parts of animals (wing, feather, beak, trunk, hooves), parts of a plant (flower, leaf, trunk, branch)</p> <p>Materials – Wood, plastic, paper, metal, hard, soft, heavy, light</p>	<p>Seasons - Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length</p> <p>Plants - 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</p> <p>Animals/Humans -Parts of the body including those linked to PSHE teaching Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue -Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales,</p>	<p>Plants - As for year 1 plus - light, shade, sun, warm, cool, water, grow, healthy</p> <p>Animals/Humans - Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta)</p> <p>Materials -Names of materials – increased range from year 1 Properties of materials - as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing. Bend/bending,</p>	<p>Plants - Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal – wind dispersal, animal dispersal, water dispersal</p> <p>Animals/Humans - Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints</p> <p>Rocks - 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</p> <p>Light - Light, light</p>	<p>Animals/Humans - 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</p> <p>Living Things/Habitats – Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate</p> <p>States of Matter - Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle</p> <p>Sound – Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation</p>	<p>Living things/Habitats - Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings</p> <p>Animals/Humans - Puberty: the vocabulary to describe sexual characteristics</p> <p>Properties/Materials changes - Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non-reversible change, burning, rusting, new material</p> <p>Earth and Space - Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets Forces - Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears</p>	<p>Living things/Habitats - Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non-flowering Animals/Humans - Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle Evolution and inheritance - Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils Light - As for year 3 plus</p>
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	<p>feathers, fur, beak, paws, hooves Names of animals experienced first-hand from each vertebrate group</p> <p>Materials - 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</p>	<p>stretch/stretching</p> <p>Living Things/Habitats - 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.</p>	<p>source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous</p> <p>Forces and Magnets - 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</p>	<p>Electricity - 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 as this is taught in year 6</p>	<p>straight lines, light rays.</p> <p>Electricity - Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage NB 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</p>
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Vocabulary skills

- Be able to use simple language to describe plants, animals and name some of their parts.
- Comment on what they notice, asking questions and giving reasons.

- Be able to use simple scientific vocabulary to recognise and describe plants, materials, animals, seasons etc
- To make simple observations during experiments and investigations

- Be able to use an increasing variety of scientific vocabulary to recognise and describe plants, materials, animals, seasons etc
- To make simple predictions with basic reasoning based.
- To comment on observations during scientific experiments/ investigations.

- To identify and describe scientific processes using appropriate technical vocabulary.
- To recognise and compare, finding similarities and differences.

- To recognise and describe scientific processes accurately.
- To identify and find patterns
- To comment on observations in scientific investigations, drawing on prior knowledge and making suggestions for changes they see

- To give reasons based on scientific evidence on observations made during scientific investigations.
- To clearly explain scientific processes and give reasons for what they observe.

- To give reasons based on scientific evidence on observations made during scientific investigations.
- To clearly describe scientific processes using appropriate scientific vocabulary with accuracy.
- To reflect critically, asking questions and evaluating predictions and data.
- Draw conclusions based on scientific evidence during investigations.

Seasonal Change	<p>- Understand the effect of changing seasons on the natural world around them</p>	<p>-Name seasons and observe changes -observe and describe weather associated with the seasons and how day length varies.</p>					
Plants	<p>3&4 year olds</p> <ul style="list-style-type: none"> plant seeds and care for growing plants <p>Reception:</p> <ul style="list-style-type: none"> explore the natural world around them 	<p>- identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. - describe the basic structure of a variety of common flowering plants, including trees.</p>	<p>-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.</p>	<p>- identify and describe the functions of different parts of flowering plants - explore the requirements of plants for life/growth and how they vary from plant to plant - investigate water transportation in plants - explore part flowers play in the life cycle of flowering plants, (pollination, seed formation seed dispersal.)</p>			

Animals Including Humans	<p>3&4 Year olds:</p> <ul style="list-style-type: none"> understand the key features of the life cycle of a plant and an animal <p>Children in Reception</p> <ul style="list-style-type: none"> name and describe people who are familiar to them describe what they see, hear and feel whilst outside 	<p>-identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</p> <p>-identify and name a variety of common animals that are carnivores, herbivores and omnivores</p> <p>-describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)</p> <p>- identify, name, draw and label the basic parts of the human body and associate parts with senses</p>	<p>-notice that animals, including humans, have offspring which grow into adults</p> <p>-find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>- describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>- 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</p> <p>- identify that humans and some other animals have skeletons and muscles for support, protection and movement.</p>		<p>- describe the changes as humans develop to old age.</p>	<p>-identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <p>- recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>-describe the ways in which nutrients and water are transported within animals, including humans.</p>
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Materials/Rocks	<p>3&4 year olds</p> <ul style="list-style-type: none"> • use all their senses in hands-on exploration of natural materials • explore collections of materials with similar or different properties • talk about what they see, using a wide vocabulary • talk about the differences between materials and changes they notice <p>Reception:</p> <ul style="list-style-type: none"> • explore the natural world around them 	<p>-distinguish between an object and the material from which it is made</p> <p>-identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</p> <p>-describe the simple physical properties of a variety of everyday materials</p> <p>-compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>-identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>-find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>-compare and group different kinds of rocks on the basis of appearance and simple physical properties</p> <p>-describe simply how fossils are formed (living things trapped in rock)</p> <p>-recognise soils are made from rocks and organic matter.</p>	<p>-describe the simple functions of the basic parts of human digestive system</p> <p>-identify the different types of human teeth and their simple functions</p> <p>-construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>-compare and group everyday materials on properties, hardness, solubility, transparency, conductivity (electrical/thermal), and response to magnets</p> <p>-know that some materials will dissolve in liquid to form a solution, describe how to recover a substance from a solution</p> <p>-use knowledge of solids, liquids and gases to decide how mixtures might be separated (filtering, sieving, evaporating)</p> <p>-give reasons, based on evidence from comparative/ fair tests, for the particular uses of everyday materials - metals, wood and plastic</p> <p>-demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>- explain that some changes result in new materials, and that this kind of change is not usually reversible, (burning / acid on bicarb)</p>	
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- 3&4 year olds
- begin to understand the need to respect and care for the natural environment and all living things

- 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.

- 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.

- 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.

- 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.

Light				<ul style="list-style-type: none"> - 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 a solid object - find patterns in the way that the size of shadows change 			<ul style="list-style-type: none"> - 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.
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Forces and Magnets

3&4 year olds

- explore and talk about different forces they can feel

-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/repel each other and attract some materials and not others (2 poles)
-predict whether two magnets will attract or repel each other, depending on which poles are facing.
-compare and group together variety of materials whether they are attracted to a magnet, identify some magnetic materials

-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.

Sound					<ul style="list-style-type: none">- 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.		
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Electricity					<ul style="list-style-type: none"> - 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. 		<ul style="list-style-type: none"> -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.
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States of matter					<ul style="list-style-type: none">-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.		
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Earth and Space						<ul style="list-style-type: none">- 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.	
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DONOR

Evolution and Inheritance							<ul style="list-style-type: none">- 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.
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Knowledge about scientists	<ul style="list-style-type: none">-To recognise people that use Science as part of their jobs.-Opportunities to meet 'people who help us' with science e.g. doctors/nurses/firemen		<ul style="list-style-type: none">- To recognise some famous scientists and describe what they have done (e.g. Neil Armstrong, Tim Peake, Jane Goodall, Florence Nightingale)	<ul style="list-style-type: none">-To recognise and describe the impact Scientists have on the world and how they have made huge changes to modern life (Thomas Eddison, Mary Anning Fossil Hunter, Isaac Newton - light).		<ul style="list-style-type: none">- To look critically at the work of Scientists, evaluating and analysing.- Ask critical questions about the work of Scientists.- Recognise that Science is an ever changing and evolving subject, new discoveries and contradictions to past studies etc.(Zhang Heng – space, Charles Darwin – evolution, Isaac Newton – light)	
	<ul style="list-style-type: none">-Underwater Street: Liverpool-Farmer Teds-Chester Zoo- Fire Station-School Nurse-Knowsley Safari-Delamere Forest	<ul style="list-style-type: none">-Chester Zoo-Blue Planet-The Creepy Crawly Show-The Catalyst Museum-Fiddlers Ferry Nature Reserve-School Nurse-Fire station-Formby/Crosby beach	<ul style="list-style-type: none">-Delamere Forest residential-The Catalyst Museum-Fiddlers Ferry Nature Reserve-School Nurse-Knowsley Safari-‘The creepy crawly show’-Formby/Crosby beach-Pex Hill-Gillmoss recycling discovery centre	<ul style="list-style-type: none">-Catalyst Museum-Chester Zoo-Knowsley Safari-Liverpool Museum	<ul style="list-style-type: none">- Tatton Hall residential-The Catalyst Museum-Chester Zoo-Liverpool Museum	<ul style="list-style-type: none">-Colomendy/Menai residential-The Catalyst Museum-Chester Zoo-School Nurse-Police-Liverpool Museum-Hope uni links (aspirations)	<ul style="list-style-type: none">-Colomendy /Menai residential-The Catalyst Museum-Chester Zoo-Chemistry with cabbage-School Nurse-Police-Liverpool Museum-Hope uni links (aspirations)

Assessment:

A = Exceeding expectations: Pupils who are exceeding the expectations will typically be providing evidence of achievement which consistently extends their learning beyond the confines of the task. They are working in ways which show deeper understanding and mastery and which are above the norm for their year expectations and program of study. Assessment in each of the strands could be described as:

SKILLS:

- Showing greater: complexity; research; observation; originality; perception; aspiration; creativity.
- Showing greater: technique; skill; control; complexity; mastery; quality; judgement; creativity.
- Showing greater: judgement; autonomy; independence; perception; subtlety.

KNOWLEDGE

- Showing greater: breadth; contextual understanding; explanation; judgement.
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E1/E2= Meeting expectations: Pupils who are meeting the expectations in full will typically be providing consistent evidence of achievement which shows that they have

understood and confidently achieved the assessment criteria. They are working at a level which is appropriate for their year expectations and program of study.

WT1,2,3 or SB= Not yet meeting expectations:

Pupils who have yet to meet the expectations in full will typically be providing evidence of achievement which is consistently less resolved and confident than their year expectations and program of study,