SCIENCE		RECEPTION	YEAR 1	YEAR 2	YEAR 3	YEAR 4	Upper KS2 (Y5 and Y6)
QUESTION		**Ask simple questions** about immediate environment.	**Ask questions** and know some can be answered using scientific enquiry.		**Identify scientific questions.** ie can be investigated through scientific enquiry.		**Raise scientific questions** and **hypothesise**
SCIENTIFIC ENQUIRY	**OBSERVE**	**Qualitative** Talk about similarities and differences. Be curious – ask questions Observe changes use senses Make simple records	**Qualitative and Simple Quantitative** Observe change over time. Select and use simple equipment. Measure change over time e.g. plant growth using simple units. Record in words and pictures Identify simple changes and sequence them Begin to use scientific language with increased independence.		**Qualitative and Quantitative** Recognise when changes can be observed over time. (fossils – can't observe) Decide what observations to make with increased confidence and independence. Systematic/ careful observations. Use bar charts, pictograms, tables. Take accurate measurements. Use time graphs and other graphs. (Year4) Draw simple conclusions from changes observed. Suggest improvements to the way in which they observe		**Qualitative and Quantitative** Decide when to use observing changes over time. Decide how detailed observations need to be. Decide what equipment to use. Take accurate/ precise measurements, Record using diagrams, tables, bar and line graphs. (Scatter graphs used and line graphs in year 6) Take repeated readings when appropriate. Recognise the effect of changing the time and number of observations. Draw valid conclusions from data Recognise the significance of things changing over time. Talk about and explain changes using scientific knowledge.
	CLASSIFY	**Talk and Sort** Curious about similarities and differences, With support – ask questions and talk about ideas. Use senses to sort and match. Match things that are the same Find things that are similar and different Sort or group things in their own way Use simple equipment to sort and match I talk about how I have sorted and matched things	**Identify and Classify** Ask questions – how and why things are similar or different Decide what to observe to identify and sort things Sort objects by observable and behavioural features Make comparisons between simple features e.g. familiar plants, animals, materials Compare and contrast e.g. living/ dead/ never alive; materials Record observations in words and pictures. Use sorting circles/ tables identify similarities and differences Begin to use simple scientific language to talk about how things are similar or different		**Classify and Find Patterns** Talk about what criteria to sort / classify with Decide what equipment to use Talk about things that can be grouped and recognise when questions can be answered by sorting and classifying. Carry out simple tests to sort and classify Use Carroll diagrams Venn diagrams and more complex tables by the end of year 4 Use simple keys and branching data bases to identify things Make simple branching databases for things that have clear differences Draw simple conclusions about the things sorted and classified		**Classify and Find Patterns** Decide when sorting / classifying will be helpful to answer questions Decide what equipment, tests, sources of information to use to identify and classify things Use a series of tests to sort and classify materials Uses secondary sources to identify and classify things Make own keys and branching databases with four terms (5) more than four terms(6) – evaluate how well they work Use more than one piece of scientific evidence to identify and classify things Draw valid conclusions when sorting and classifying

		Yellow	Green	Red	Blue
				Talk about the similarities and differences identified using some scientific language Suggest improvements to the way things are sorted Classify animals/ materials. Link two variables e.g. *the closer the magnet the bigger the force.*	Recognise the significant (6 – Evolution and inheritance) Talk about and explain what I have done using scientific knowledge
Pattern Seek		Observe Which birds come to our bird feeder? I think the leaves are changing on our trees. Is there a pattern? Be curious and ask questions (with support) Observe more than one thing at a time. Use my senses to look for patterns. Make simple recordings of what is seen and use simple equipment.	Use non-standard units to measure what is seen. Record events that might be related. Record in words and pictures on in simple pre-prepared formats such as tables, charts, tally charts. Question how and why things are linked. With help, decide what patterns to observed and measure and how to do it.	Talk about where patterns might be found. As they progress to year 3, recognise questions that can be investigated via pattern seeking with greater independence. Decide which data to collect. Decide which equipment to use. (be able to use thermometers by the end of year 4) Use equipment accurately to collect data using standard measures. Make records using tables and charts. Begin to interpret data collected through data loggers. Draw conclusions about patterns from 2 sets of data. Talk about patterns, using scientific language. Suggest improvements to the way I look for patterns.	Recognise when a variable can't be controlled and decide when pattern seeking can be used to answer a question. Decide how detailed my data needs to be. Decide which equipment to use to take accurate measurements. Use equipment accurately to collect observations Record data appropriately and accurately Present data – scatter graphs and frequency charts Recognise patterns in results Recognise the effect of sample size and reliability Draw valid conclusions from data about patterns and recognise limitations Recognise significance of relationships between sets of data Talk about and explain cause and effect patterns using scientific knowledge and understanding Evaluate how well I have looked for patterns.

		Explore objects/ materials/ living things/ resources	**Perform simple comparative tests**	**Comparative and fair tests**	**Design own comparative and fair tests**
CONTROL INVESTIGATIONS: comparative and fair testing		Curious about how things behave Ask questions about what can be tested Talk about ideas for testing and how things behave Use senses to observe how things behave Record observations simply Use simple equipment Talk about what I have done Talk about whether something makes a difference	e.g. *What is the best material for an umbrella?* **(1)** e.g. *What if plants do not get light and water?* (2) ask why and how questions make comparisons about how things behave notice links between cause and effect (with help) with support – identify simple variables to change and measure plan simple comparative tests use non-standard units and simple equipment to record data record in words or pictures or in simple prepared formats such as tables and tally charts	Predict. Fair tests e.g. *How does distance affect magnet strength?* (3) Predict. Language of independent and control variable.　(4) Talk about links between cause and effect. With help, pose a fair test question Help to plan a comparative or fair test – adult initiated Decide what data to collect Decide what equipment to be used Use range of equipment to collect data using standard measures Make records using tables and bar charts Begin to use and interpret data collected through data loggers Draw simple conclusions from comparative and fair tests Talk about and explain simple causal relationships using some scientific language Suggest ways that I can improve my fair tests	Recognise when variables need to be controlled and decide when a comparative or a fair test is the best way to answer a question. Plan comparative or fair tests, selecting variables, to measure, change and keep the same. Decide what equipment to use to make measurements as accurate as possible. Use equipment accurately to collect observations Record data appropriately and accurately Present data in line graphs Identify causal relationships Draw valid conclusions based on the data Recognise the significance of the results of comparative and fair tests Talk about and explain relationships using scientific knowledge/understanding Evaluate fair test / comparison – decide what was easy/difficult to control
RESEARCH		Listen and respond to stories about scientific processes/ events/ objects. Understand that things can be found out from books and electronic resources as well as asking people. Listen Find pictures of things and simple facts with support Talk about findings	Be interested in the way in which things work. Questions why things are they way they are. With support - Find information using given sources. e.g. *animals.* Select information from a range of given sources. Record findings in words and pictures Talk about findings – begin to use scientific vocabulary. Given opinions. Decide if information is useful.	**Research** using given sources. e.g. *research different food groups and how they keep us healthy* **Select information** to support findings. e.g. *research animals* Know when questions can be answered by gathering information – are there some that can't? Record findings and present it in different ways Use data – talk about what it means Draw conclusions from research Suggest improvements that can be made – how can I find out more?	**Explore relevant information by using a wide range of secondary sources.** Explore how scientific ideas have developed over time. Identify evidence that has been used to support or refute ideas. **(year 5 space)** **Decide what information might be useful in order to research a question** **Use information and data from a range of sources** **Understand how data has been obtained**

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						Develop understanding of bias and unreliable data – begin to question it (opinion v fact) **Present findings using suitable methods** **Draw valid conclusions from findings** **Discuss findings using scientific vocabulary** **Evaluate research – have I found out enough?** **Could anymore be found out – recognise limitations**	
MODEL	**Concrete** context. Create drawings and models of their environment	**Concrete** context Draw diagrams e.g. *parts of plants/ the body.*	**Explore** and **create** drawings and physical models e.g. *habitats.*	**Abstract** contexts e.g. processes and phenomena such as forces/ light. **Use** labelled diagrams and drawings and physical models.	**Abstract** contexts e.g. processes and phenomena such as sound/ electricity. **Create** labelled diagrams and drawings and physical models.	**Abstract** contexts. **Evaluate** diagrams/ models e.g. states of matter; solar system.	**Abstract** contexts. **Create** own versions of models. e.g. circulatory system; light.
CONCLUDE	**Explain** simple phenomena: How? Why?	**Describe** what has happened or been observed.	**Explain** why a simple observation occurred. **Evaluate** the effectiveness of observations.	**Explain an observation or an event in scientific terms.** Distinguish between what has been observed and why it happened. Begin to link evidence from secondary sources as well as primary. Suggest improvements.		**Evaluate original hypothesis against observed evidence and reach appropriate conclusions.** Identify causal relationships. Begin to identify how reliable the data is.	
Vocabulary	**Reception**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare, describe, similar/ities, different/ces, beaker, pipette, syringe	Questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare, describe, similar/ities, different/ces,	Questions, answers, equipment, gather, measure, record, results, sort, group, test, explore, observe, compare, describe, similar/ities, different/ces,	Previous vocab plus scientific enquiry changes over time, notice patterns, secondary sources, comparative tests, fair tests, careful, accurate,	Previous vocab plus enquiry types increase, decrease, identify, classify, order, notice patterns, relationships, appearance, present results, data loggers	Previous vocab plus, notice patterns, relationships, independent variable, dependent variable, controlled variable, accuracy, precision, degree of trust, classification	Previous vocab plus opinion/fact, confidently name scientific enquiry types

| | | beaker, pipette, syringe | beaker, pipette, syringe observe changes over time, notice patterns, secondary sources, hand lenses, egg timers, identify, classify, data, | observations, equipment, gather, measure, record, data, evidence, results, keys, bar charts, table, results, conclusions, predictions, support, thermometers | | keys, scatter graphs, line graphs, causal relationships, support/refute, data loggers | |