	Lower KS2 Years 3 & 4 ***'The Blossoming Scientist'***	*Uni-structural: the Pupil's response focuses on one relevant aspect.* 	*Multi-structural: the Pupil's responses focuses on several relevant aspects* 	*Relational: The different aspects have become integrated into a coherent whole* 	*Extended Abstract: The whole may be conceptualised at a higher level and generalised to a new topic or area.* 
Working Scientifically Skills		**Emerging**	**Developing**	**Secure**	**Exceeding**
Planning	**Asking questions and recognising that they can be answered in different ways** • Asking relevant questions • Use different types of scientific enquiries to answer them	**List** simple questions. **Answer** questions posed by the teacher.	**Ask** valid questions for enquiries using question stems as starters. **Answer** by **combining** a number of sources including the investigation.	**Devise** a range of valid questions for a series of different types of enquiry based on prior knowledge/learning. **Identify** the type of enquiry chosen to answer their own questions or that a teacher. **Analyse** a number of sources to check if questions from the enquiry are **answered** sufficiently.	**Theorise** before **generating** questions that should give answers to **theories** and questions posed. **Create** a variety of different scientific enquiries to answer their own questions. **Evaluate** the series of scientific enquiries and **reflect** on which was the most effective and why.
	Engaging in practical enquiry to answer questions • Setting up simple practical enquiries, comparative and fair tests *Test types:* ➢ *identifying and classifying* ➢ *observing over time* ➢ *fair testing* ➢ *pattern seeking* ➢ *researching using secondary sources*	**Follow** a given line of enquiry plan to complete tests and make observations. **Use** practical resources provided to gather evidence.	**Suggest** their own plan to carry out: observations, tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. **Select** from a range of practical resources given. **Gather** evidence to answer questions generated by themselves or the teacher.	**Apply** their own plan to carry out**:** observations, tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. **Compare** the suitability of a range of practical resources**.** **Decide** how to gather evidence to answer their own questions or that of a teacher. **Recognise** when secondary sources can be used to answer questions that cannot be answered through practical work.	**Formulate** the most appropriate type of scientific enquiry to answer questions. **Appreciate** that aspects of the enquiry can be set up in different ways, **judge** and **justify** choices made using wider scientific knowledge when **explaining.**
Obtaining and Presenting Evidence	**Making observations and taking measurements** • Making systematic and careful observations • Taking accurate measurements using standard units and using a range of equipment where appropriate	**Identify** simple changes through observations using their senses and aided by using a range of equipment.	**Describe** simple observations by making **comparisons** and noticing changes. **Select** and **use** equipment to take measurements using standard units of measurement.	**Gather** systematic and careful observations to **summarise** outcomes. **Apply** knowledge of how to use a range of equipment for taking accurate measurements of: length, time, temperature and capacity using standard units of measurement. *E.g using thermometers and data loggers.*	**Reflect** on systematic and careful observations throughout making links between them. **Identify** the equipment most suited to the type of investigation to support accurate measurements.

	Recording and presenting evidence • Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	**Record** and **present** the evidence that I can see to answer the question.	**Use** a given format to **record** and **present** evidence and observations in response to answering a question.	**Discuss** and sometimes **decide** how to **record** and **present** observations and evidence. *E.g using photographs, videos, pictures, labelled diagrams or writing.* **Apply** knowledge about how to **record** measurements *E.g using tables, tally charts and bar charts (given templates, if required, to which they can add headings).* **Apply** knowledge about how to **record** classifications *E.g using tables, Venn diagrams, Carroll diagrams.* **Present** data in different ways to help answering the question with some support given.	**Evaluate** the best way to record and present observations and evidence to show findings having used different ways to answer questions.
	Communicating their findings • Reporting on findings from enquiries, including oral and written explanations • Displays or presentations of results and conclusions	**Identify** some findings and **discuss** with an adult using some scientific vocabulary. **Select** results to **record** in writing.	**Describe** findings using scientific vocabulary orally and in writing. **Display** results and communicate findings in writing.	**Explain** using the appropriate scientific vocabulary when communicating findings to an audience both orally and in writing. **Sequence** and **present** findings from enquiries in a logical way. *E.g in a ranked order.*	**Summarise** findings from the enquiry selecting the correct scientific vocabulary orally and in writing to **conclude** the outcomes. **Justify** why results are presented or displayed in a particular way.
Considering evidence and Evaluating	**Answering questions and concluding** • Identifying differences, similarities or changes related to simple scientific ideas and processes • Using straightforward scientific evidence to answer questions or to support their findings	**List** similarities and differences in the evidence gathered. **Suggest** answers to the question.	**Describe** similarities and differences then **compare** the data. **Explain** answers to the question using scientific evidence to support their findings. **Use** some prior knowledge to **combine** with data and observations from findings.	**Interpret** data to **generate** simple comparative statements based on the evidence. (Begin to) **identify** naturally occurring patterns and causal relationships. **Conclude and answer** their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	**Reflect** on the data using scientific vocabulary. **Evaluate** answers to their own and others' questions along with the type of enquiry test.
	Evaluating and raising further questions and predictions • Using results to draw simple conclusions • Make predictions for new values, suggest improvements • Raise further questions	**Describe** answers to the enquiry question. **List** new questions to investigate.	**Provide** answers to the enquiry question using the results gathered. **Ask** further questions because of the enquiry findings.	**Explain** conclusions based on the evidence and current subject knowledge. **Explain** ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. **Use** their evidence to suggest values for different items tested using the same method. *E.g the distance travelled by a car on an additional surface.* **Relate** scientific experience to **formulate** further questions which can be answered by extending the same enquiry.	**Predict** using evidence from the enquiry the outcome of similar experiments might **conclude**. **Hypothesise** answers to new questions that can be generated by extending the same enquiry.

SOLO Taxonomy

Biggs and Collis 1982

Define
Identify
Do simple procedure

Define
Describe
List
Do algorithm
Combine

Formulate questions
Compare/contrast
Explain causes
Sequence
Classify
Analyse -part/whole
Relate
Analogy
Apply

Evaluate
Theorise
Generalise
Predict
Create
Imagine
Hypothesise
Reflect