KS1/2 PLANNING OVERVIEW:

The planning and delivery of our science curriculum from year 1 to year 6 is bespoke to our school and has been developed over many years, initially through working in a focus group with a local science advisor. We have since developed and tweaked our curriculum through research into PSTT techniques, TAPS and PLAN, alongside OFSTED and EEF research and PSQM advice.

In KS1 and KS2, lessons are introduced through a **'Big Question'** that is directly linked to National Curriculum knowledge units. Teachers plan lessons around this question, whilst also developing working scientifically skills.

At Front Street, we group the **working scientifically skills** into five strands:

- **Find Out and Explain**
- **Classify**
- **Plan and Carry Out**
- **Observe, Measure, Record**
- **Notice and Interpret**

These skills are progressive and support the **science enquiry** process.

Our curriculum has been rigorously cross checked with NC objectives to ensure good coverage.
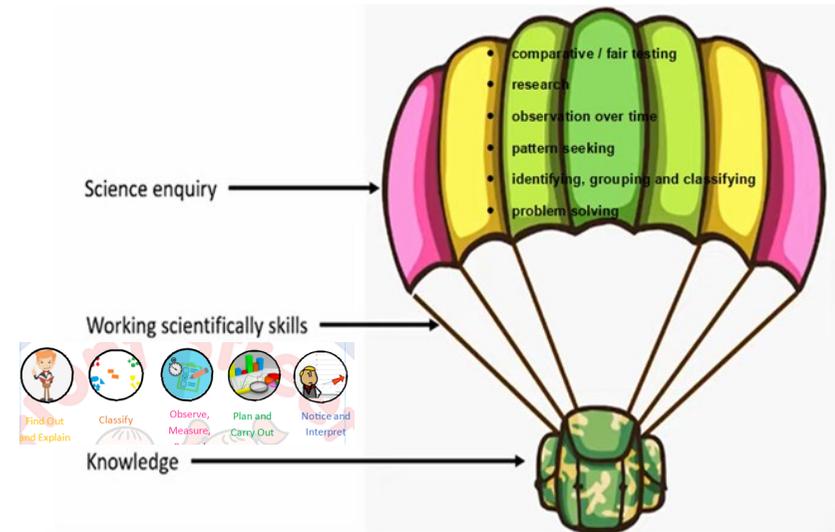
KS1—NC Working Scientifically

⬚ asking simple questions and recognising that they can be answered in different ways *(Plan and Carry Out)*

⬚ observing closely, using simple equipment *(Observe, Measure, Record)*

⬚ performing simple tests *(Plan and Carry Out)*

⬚ identifying and classifying *(Classify)*

⬚ using their observations and ideas to suggest answers to questions *(Find Out and Explain, Notice and Interpret)*

⬚ gathering and recording data to help in answering questions *(Observe, Measure, Record)*

LKS2 —NC Working Scientifically

⬚ asking relevant questions and using different types of scientific enquiries to answer them *(Plan and Carry Out)*

⬚ setting up simple practical enquiries, comparative and fair tests *(Plan and Carry Out)*

⬚ making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers *(Observe, Measure, Record)*

⬚ gathering, recording, classifying and presenting data in a variety of ways to help in answering questions *(Classify, Observe, Measure, Record)*

⬚ recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables *(Observe, Measure, Record)*

⬚ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions *(Notice and Interpret)*

⬚ using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions *(Plan and Carry Out, Notice and Interpret)*

⬚ identifying differences, similarities or changes related to simple scientific ideas and processes *(Classify)*

⬚ using straightforward scientific evidence to answer questions or to support their findings *(Find Out and Explain, Notice and Interpret)*

UKS2 —NC Working Scientifically

⬚ planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary *(Plan and Carry Out)*

⬚ taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate *(Observe, Measure, Record)*

⬚ recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs *(Observe, Measure, Record)*

⬚ using test results to make predictions to set up further comparative and fair tests *(Plan and Carry Out, Notice and Interpret)*

⬚ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations *(Notice and Interpret)*

⬚ identifying scientific evidence that has been used to support or refute ideas or arguments *(Find Out and Explain, Notice and Interpret)*

Working scientifically skill coverage (two word broad titles)

Find Out and Explain	Classify	Plan and Carry Out	Observe, Measure, Record	Notice and Interpret
Remember words and facts	Use (& construct) classification keys	Plan enquires (inc. identifying variables)	Measure / observe (over time)	Notice patterns
Describe (& explain)	Group objects	Make predictions	Record on a table	Answer questions, present findings
Use diagrams	Match properties	Carry out investigations (inc. noticing risks)	Record on a chart/ graph	Identify next steps (KS2 only)
Read and research		Use equipment		

← Ask questions (reflect) →

Find Out and Explain

	Y1	Y2	Y3	Y4	Y5	Y6
Remember words and facts	Remember simple facts and tier 3 words learned in science lessons	Remember & use tier 3 science facts & words over time (short term)	Remember and use science facts & tier 3 words used before (longer term)	Apply more tier 3 science words accurately	Begin to use complex tier 3 science words correctly	Use complex tier 3 science words fluently
Describe (& explain)	Describe science processes (with help)	Describe / recall what has been seen or learned	Use science ideas & facts to describe & begin to explain	Show developing K&U of science ideas & concepts (describe and explain)	Show clear K&U of science ideas & concepts (describe and explain)	Show a secure K&U across all KS2 topics (describe and explain)
Use diagrams	Add science word labels to diagrams (with help)	Add science labels and information to diagrams (some help)	Add science labels & information to science models to describe	Annotate science models to describe (what, where)	Draw & annotate science models to describe & explain (why, how)	Draw & annotate science models to logically describe & explain (why, how)
Read and research	With support, read to find out simple science facts that answer a question	Read to find out simple science facts to use in an answer	Read to find out relevant information to form an answer (supported)	Read to find out relevant information then link relevant facts together to answer questions and support findings.	Read a range of sources to find out information then select & prioritise facts to create an answer	Read a range of sources to find out information then select evidence that supports or refutes ideas. Answer concisely.

Classify

	Y1	Y2	Y3	Y4	Y5	Y6
Use (& construct) classification keys	Sort by using yes/no statements	Read simple classification keys	Gather information from classification keys with obvious differences	Gather information from a range of classification keys with fine differences	Construct simple classification keys (with some support)	Construct more complex classification keys
Group objects	Group into given categories	Sort into groups and begin to create own groups	Create groups for sorting	Create appropriate groups for sorting	Create own groups & sub-groups by easy observation	Create own groups & sub-groups by fine observation
Match properties	Link properties of materials to an application (with help)	Link properties of materials to an application	Combine properties required for an application, e.g. waterproof and rigid (supported)	Describe combined properties required for an application	Explain how properties suit an application	Use accurate science terminology to fully explain how properties suit an application

Plan and Carry Out

	Y1	Y2	Y3	Y4	Y5	Y6
Plan enquires (inc. identifying variables)	Ask questions and make suggestions about how to investigate (guided by teacher)	Ask simple questions and become more familiar with the different types of scientific enquiries to answer them. Begin to recognise variables (with support)	Ask questions and decide (with support) upon the best type of scientific enquiry to find the answer Select variables to change and measure (supported)	Ask relevant questions and decide (support) upon the best type of scientific enquiry to find the answer Select variables to change and measure (greater independence)	Plan different types of scientific enquiries, inc. fair and comparative tests to answer questions, including recognising and controlling variables	Plan a reliable scientific enquiry, inc. fair and comparative tests to answer questions, using variable terminology fluently and accurately
Make predictions	Suggest what might happen (with help)	Suggest what might happen in the investigation	Predict cause/ effect: E.g. If I ____, ___ will happen.	Predict a trend E.g. The greater the ___ the more the ____	Use K&U to explain a prediction	Reason K&U to make a **hypothesis**
Carry out enquiries (inc. noticing risks)	Show an ability to follow instructions involving several ideas or actions. Notice some basic risks	Perform a simple test instructed by the teacher Notice basic risks & know some common dangers	Perform practical tests (modelled and discussed) Suggest safety precautions	Perform practical enquiries with growing independence. Predict obvious risks and work safely	Perform a safe enquiry with repeats for reliability	Carry out steps for a reliable, safe enquiry and use test results to make predictions for further investigations
Use equipment	Use a limited range of science equipment correctly (with help)	Use a range of science equipment correctly	Select suitable equipment for a task (guidance)	Select suitable equipment for a task	Select equipment with the right scale for the task (with help)	Select & use equipment with right scale for the task

Observe, Measure, Record

	Y1	Y2	Y3	Y4	Y5	Y6
Measure / observe (over time)	Explore (esp. the natural world) and make observations that answer a question.	Gather data over time that helps to answer a question (inc. mass, length).	Make careful observations and take accurate measurements over time using standard units (inc. thermometer and data logger)	Make careful observations and take accurate measurements over time using standard units (inc. some conversion, e.g. time)	Observe and take measurements over time using a range of scientific equipment with increasing accuracy (inc. repeats)	Observe and take measurements over time using a range of scientific equipment with accuracy and precision (inc. repeats)
Record on a table	Use a pre drawn and pre labelled simple table to record findings using simple scientific language.	Use a pre drawn and **part labelled** simple table to record findings using simple scientific language and numbers (inc. tally)	Use a pre drawn table to present data (**chn to label both axis**)	**Construct** a table to present data	Use a frame to present a **complex** table of results showing repeated data	Construct a **complex table** to show repeated data
Record on a chart/ graph	Use a frame to build up pictograms & block charts (numbers in a **track**).	Label **one axis** on a bar chart (on the lines -modelled by teacher). Draw the bars accurately to display data.	Label **both axis** on a bar chart with some support. Scale according to the data (e.g. in 2s or 5s). Draw the bars accurately to display data.	Record findings by **constructing bar charts** accurately paying close attention to scale.	With some support, record data and results of **increasing complexity** (construct scatter graphs, bar and line graphs).	Record data and results of increasing complexity (construct scatter graphs, bar and line graphs). Develop understanding of **mean values & trend lines.**

Notice and Interpret

	Y1	Y2	Y3	Y4	Y5	Y6
Notice patterns	Use simple words (more/less) to describe patterns in data	Describe simple patterns in data & charts	Describe patterns and subtle differences in data, charts & graphs	Describe patterns, trends & relationships in data, spot potential errors	Describe patterns, trends & relationships in data and explain anomalous data (support)	Describe patterns, trends & relationships and explain anomalous data
Answer questions, present findings	Describe simply what you have found out	Use observations and ideas to suggest answers	Use results to draw simple conclusions and answer questions. Report on findings including oral and written.	Answer an initial question by describing trends & using results to explain orally and written	Use data & science knowledge to draw a conclusion	Use data & science ideas to explain the conclusion of an investigation addressing reliability
Identify next steps	-	-	Suggest improvements and raise further questions	Suggest sensible improvements and raise further questions	Identify strengths, weaknesses & improvements. Suggest next steps.	Suggest limitations of data and practical improvements. Identify next steps with reasoning.