Science: Enquiry Matrix

Type of Enquiry	Observing changes over time Children observe or measure changes to living things, materials, physical processes or events over time.	Grouping and classifying Children identify similarities and differences between materials and living things and organise them into groups.	Noticing patterns Children observe and record phenomena, carry out surveys or collect data from secondary sources and then identify relationships between data in their findings.	Research Children use secondary sources of evidence, data and information that they have not collected first-hand to answer science questions.	Comparative testing Beginning at KS1 - making simple comparisons, one thing with another	Fair testing From KS2 - children observe or measure the effect that changing one variable has on another whilst attempting to keep other variables constant.
Child-speak definition	*Observing over time is looking at or measuring how something changes over different lengths of time*	*I can find things that are similar and things that are different and sort them into groups.*	*Noticing patterns… is about collecting lots of information, sometimes by carrying out a survey, sometimes by doing some research and using that data to help me answer my question.*	*Research is about finding out information and gathering evidence using secondary sources, e.g. books, computers and technology as well as people to answer questions.*	*Looking closely, using all senses, comparing one thing with another to find differences and changes*	*Fair testing is when you change one thing only, keeping everything else (as much as possible) the same and observe or measure the effect that this has.*
Key features	***Observing or measuring how things change over time** ***Different time frames, e.g. short (afternoon/lesson), medium (days/weeks), long (seasonal change)** ***Making decisions increasingly independently – what to observe, how often, using what equipment.**	***Comparing things** ***Looking for similarities and identifying differences** ***Establishing criteria for sorting and grouping – initially given by teacher, then own criteria** ***Using a variety of ways to group and organise information, e.g. hoops, tables, branching databases, Venn diagrams, keys** ***Record and communicate outcomes in different ways, increasingly creating own databases and keys.**	***Collecting and presenting data from surveys** ***Using first-hand, as well as second-hand data** ***Comparing and contrasting information and evidence** ***Making connections, seeing links between identified patterns and growing subject knowledge** ***Often biology related**	***Recognise when research from secondary sources might be useful in addition to other evidence** ***Recognise what types of questions it can help answer** ***Use a variety of sources, including books and people** ***Become increasingly evaluative about whether sources can be trusted.**	***Carry out simple tests and make comparisons, e.g. ice cube in beaker and one covered in a sock. What happens?** ***Compare several different materials, events or artefacts, controlling conditions and variables to ensure validity.** ***Make observations Identify differences and changes over time** ***Compare evidence and rank results according to focus of enquiry**	***Using a range of equipment increasingly accurately** ***Record and present data using tables and charts (and other means of communication)** ***Making connections between cause and effect** ***Often physics linked starting points**

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FS	**Observations** *I can notice changes that happen around me *I can talk about my ideas, describing what I notice using scientific vocabulary	**Observations** *I can identify things that are similar or different	**Concluding and evaluating** *I can notice obvious simple patterns	**Planning and carrying out** *I can talk to people about a question I've asked **Gathering, recording and communicating** *I can record what I find out using words and pictures	**Planning and carrying out** *I can compare one thing with another **Gathering, recording and communicating** *I can talk about the changes I observe *I can record my observations	**Concluding and evaluating** *I can suggest when something in my test might be unfair
KS1	**Asking and answering questions** *I can ask questions about how (and why) things change **Observations** *I can identify changes that we might observe over time *I can talk about my ideas, describing what I notice using scientific vocabulary	**Observations** *I can use simple scientific vocabulary to describe how things are similar or different **Planning and carrying out** *I can group or match things using given criteria.	**Planning and carrying out** *I can carry out a simple survey, with support **Gathering, recording and communicating** *I can collect and present data in a pictogram, block graph, table or chart **Concluding and evaluating** *I can notice obvious simple patterns in the evidence I've collected	**Planning and carrying out** *I can talk to people about what they know that could help me answer a question *I can use pictures and simple books to help me find information *I can use computers and other technology to locate pictures and simple information **Gathering, recording and communicating** *I can record what I find out using words and pictures	**Planning and carrying out** *I can compare one thing with another **Gathering, recording and communicating** *I can talk about the changes I observe *I can record my observations in simple formats, e.g. words, pictures, tables or tally charts	**Concluding and evaluating** *I can suggest when something in my test might be unfair
LKS2	**Asking and answering questions** *I can decide when a question can be answered by observing over time **Observations** *I can decide what observations to make, how often they need to be made and using what equipment **Planning and carrying out** *I can use a range of equipment to collect data, using standard measures **Gathering, recording and communicating** *I can describe changes using scientific vocabulary	**Asking and answering questions** *I can decide when identifying and classifying things might be useful as a method to use to answer a science question **Observations** *I can identify observable similarities and differences to observe or measure **Gathering, recording and communicating** *I can use Venn diagrams, Carroll diagrams, branching databases and keys to help me communicate what I've found out.	**Asking and answering questions** *I can recognise when to look for patterns to answer a question **Planning and carrying out** *I can carry out surveys, suggesting what evidence I need to collect and what equipment I could use *I can describe patterns in data I collect *I can notice how a pattern changes and suggest what that might mean	**Asking and answering questions** *I can recognise when to use secondary sources to answer a question *I can use other people's data, as well as my own, to find evidence to answer a question **Gathering, recording and communicating** *I can present my information in different ways and using my own words	**Asking and answering questions** *I can identify properties or features (e.g. absorbency, insulating properties) I might compare **Planning and carrying out** *I can suggest how I could observe or measure the feature I am comparing *I can decide what equipment I could use.	**Asking and answering questions** *I can recognise when to use a fair test to answer a question **Planning and carrying out** *I can plan a simple fair test, decide what data I need to collect and equipment/methods I should use *I can use a range of equipment to collect data **Gathering, recording and communicating** *I can record evidence using tables and charts **Concluding and evaluating**

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						*I can draw simple conclusions saying whether a test is fair or not (and why)
UKS2	**Asking and answering questions** *I can write a clear question for my observing over time investigation **Planning and carrying out** *I can decide which equipment / methods to use to collect sufficient and accurate evidence of change over time **Observations** *I can decide how detailed my observations need to be and over how long they need to be made in order to answer a science question **Gathering, recording and communicating** *I can talk about changes that take place over time and explain them using science subject knowledge.	**Asking and answering questions** *I can write a clear question for my identifying and classifying investigation **Planning and carrying out** *I can decide the best method to use to sort, group and classify *I can use different practical tests to help me identify differences and similarities *I can use secondary sources to provide information *I can make my own keys and branching databases **Concluding and evaluating** *I can explain that I sometimes need to use more than one source of evidence in order to know how to classify things.	**Asking and answering questions** *I can write a clear question for my pattern seeking investigation **Planning and carrying out** *I can plan specifically to collect and present data from a variety of sources in order to answer a science question **Gathering, recording and communicating** *I can say whether the evidence that I've collected can be trusted (e.g. is it a big enough sample size? Is more evidence required?) **Concluding and evaluating** *I can say why patterns might vary across the evidence I have collected, using subject knowledge to help in identifying relationships between data and findings	**Asking and answering questions** *I can write a clear question for my research using secondary data investigation **Planning and carrying out** *I can decide which secondary sources of evidence to use *I can decide whether other people's data is reliable / trustworthy *I can decide how best to collect and present my findings, selecting appropriate evidence for a particular purpose **Concluding and evaluating** *I can use evidence to support or refute a scientific argument	**Asking and answering questions** *I can write a clear question for my comparative test *I can recognise when to use a comparative test to answer a question **Planning and carrying out** *I can decide how to collect and present the data I've collected to help me answer my question **Concluding and evaluating** *I can explain how I made the results of my test reliable	**Asking and answering questions** *I can write a clear question for my fair test *I can plan a fair test myself, selecting the variables I need to measure (dependent), change (independent) and keep the same (control) to produce evidence to answer my question **Planning and carrying out** *I can explain how I will make/have made a test fair *I can identify which variables cannot be controlled **Observations** *I can use equipment accurately to make observations, take measurements and collect evidence that I need **Gathering, recording and communicating** *I can record and present data appropriately **Concluding and evaluating** *I can draw valid conclusions linked to my own and other evidence