

Elston Hall Learning Trust

Working Scientifically

	Asking questions and planning enquiries	Setting up enquiries	Observing and measuring	Recording	Interpreting & reporting	Evaluating
EYFS	Understand 'why' questions like: "Why do you think the caterpillar got so fat?" (Communication and Language, EYFS Framework) Ask questions to find out more and to check what has been said to them. (Communication and Language, EYFS Framework)	Children in EYFS are not expected to set up their own enquiries.	Use all their senses in hands-on exploration. (Understanding the World, EYFS Framework) Talk about what they see, using a wide vocabulary. (Understanding the World, EYFS Framework) Talk about the different forces they can feel. (Understanding the World, EYFS Framework) Explore the natural world around them. (Understanding the World, EYFS Framework) Explore collections of materials with similar and/or different properties. (Understanding the World, EYFS Framework) Explore how things work. (Understanding the World, EYFS Framework)	Drawing pictures of animals and plants. (Understanding the World, EYFS Framework) Make comments about what they have heard. (Understanding the World, EYFS Framework)	Children in EYFS are not expected to interpret or report.	Children in EYFS are not expected to evaluate.

KS1	Asking questions	Setting up enquiries	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classification 	Be able to ask Yes/No questions to aid sorting.	Identify the headings for the two groups (it is... it is not...).	Be able to compare objects based on obvious observable features e.g. size, shape, colour, texture etc.			To sort objects and living things into two groups using a basic Venn or simple table.	Talk about the number of objects in each group i.e. which has more or less.	Children in KS1 are not expected to draw conclusions. They are expected to make observations which will help them to answer questions. They do not have the subject knowledge to give reasons for what they observe so they cannot draw scientific conclusions.	Children in KS1 are not expected to make scientific predictions as they do not have the subject knowledge to do this. That does not mean you should not ask children what they think may happen but this will be based on experience or simply a guess.	Children in KS1 are not expected to evaluate. However, children should be encouraged to consider their method and adapt this where necessary.
Researching 	Ask one or two simple questions linked to a topic.					Present what they have learnt verbally or using pictures.	Be able to answer their questions using simple sentences.			
Comparative / fair testing 	Identify the question to investigate from a scenario or choose a question from a range provided.	Teachers would choose the equipment required for KS1 experiments.	Make observations, sometimes with simple equipment, linked to answering the question.	When appropriate, measure using standard units where all the numbers are marked on the scale.	Record data in simple prepared tables, pictorially or by taking photographs.	Present what they learned verbally, using pictures or block diagrams.	Ask one or two simple questions linked to a topic.			
Observing over time	Ask one or two simple questions linked to a topic.	Teachers would choose the equipment required for	Make observations linked to answering the question.	When appropriate, measure using standard units where all the numbers are marked on the scale.	Record data in simple prepared tables, pictorially or	Present what they learned verbally or	Answer their question in simple sentences using their			

		KS1 experiments			by taking photographs.	using pictures.	observations or measurements.			
Pattern seeking 	Ask a question that is looking for a pattern based on observations.	Teachers would choose the equipment required for KS1 experiments	Make observations, sometimes with simple equipment, linked to answering the question.	When appropriate, measure using standard units where all the numbers are marked on the scale.	Record data in simple prepared tables, and tally charts.	Present what they learned verbally.	Answer their question in simple sentences using their observations or measurements.			

LKS2	Asking questions	Setting up enquiries	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classification 	Be able to ask Yes/No questions to aid sorting.	Be able to put appropriate headings onto intersecting Venn and Carroll diagrams.	Be able to compare objects based on more sophisticated observable features. Present observations in labelled diagrams.			To sort objects and living things into groups using intersecting Venn and Carroll diagrams.	Spot patterns in the data particularly two criteria with no examples e.g. there are no living things with wings and no legs.	Draw simple conclusions, when appropriate, for patterns e.g. a flying insect with no legs might always crash land.		Suggest improvement e.g. a wider range of objects – only looked at British birds. Suggest new questions arising from the investigation.
Researching	To ask a range of questions linked to a topic.	To choose a source from a range provided.				Present what they have learnt verbally or using	Be able to answer their questions using simple			Suggest limitations e.g. only had one book. Suggest new questions

						labelled diagrams.	scientific language.			arising from the investigation.
Comparative / fair testing 	To ask a range of questions linked to a topic.	Decide what to change and what to measure or observe.	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.	Measure using standard units where not all the numbers are marked on the scale.	Prepare own tables, with support in Y3, to record own data.	Present data using scientific language in tables and bar charts.	Refer directly to their evidence when answering the question.	Where appropriate provide oral or written explanations for their findings.	Use results from an investigation to make a prediction about a further result.	Suggest improvements e.g. method of taking measurements. Suggest new questions arising from the investigation.
Observing over time 	To ask a range of questions linked to a topic.	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.	Make observations linked to answering the question.	When appropriate, measure using standard units where all the numbers are marked on the scale.	Prepare own tables, with support in Y3, to record own data.	Present data using scientific language in tables and labelled diagrams.	Refer directly to their evidence when answering the question..	Where appropriate provide oral or written explanations for their findings.	Use results from an investigation to make a prediction about a further result.	Suggest improvements e.g. method of taking measurements. Suggest new questions arising from the investigation.
Pattern seeking 	To ask a range of questions linked to a topic.	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.	Make observations linked to answering the question.	When appropriate, measure using standard units where all the numbers are marked on the scale.	Prepare own tables, with support in Y3, to record own data.	Present data using scientific language in tables, tally charts and labelled diagrams.	Refer directly to their evidence when answering the question.	Where appropriate provide oral or written explanations for their findings.	Use results from an investigation to make a prediction about a further result.	Suggest improvements e.g. method of taking measurements. Suggest new questions arising from the investigation.

UKS2	Asking questions	Setting up enquiries	To observe closely	To take measurements	To gather and record results	To present results	To interpret results	To draw conclusions	To make a prediction	To evaluate an enquiry
Classification 	Be able to ask Yes/No questions to aid sorting and decide which ways of sorting will give useful information.	Identify specific clear questions that will help to sort without ambiguity.	Be able to compare not only based on physical properties but also on knowledge gained from previous enquiry.			Create branching databases (tree diagrams) and keys to enable others to name living things and objects.	Be able to talk about the features that objects and living things share and do not share based on information on the key.	Be able to use data to show that living things and materials that are grouped together have more things in common than with things in other groups.		Be able to explain using evidence that the classification key will only work for the living things or materials it was created for.
Researching 	Ask a range of questions where some can be answered through research and others cannot.	Choose suitable sources to use.				Present what they have learnt in a range of different ways e.g. graphic organisers.	Be able to answer their questions using scientific evidence gained from a range of sources.			Be able to talk about their degree of trust in the sources they've used.
Comparative / fair testing 	To ask a range of questions and identify the type of enquiry that will help to answer the questions. Then, to ask further questions based on results.	Recognise and control variables where necessary.	Choose equipment to use and decide what to do and what to observe or measure in order to answer the question.	Measure using standard units using equipment that has scales involving decimals.	Prepare own tables to record data including columns for taking repeated readings.	Choose an appropriate form of presentation including line graphs.	Be able to answer their question describing causal relationships.	Provide oral or written explanations for their findings.	Use test results to make predictions for further investigations.	Explain their degree of trust in their results e.g. precision in taking measurements, variables that may not have been controlled, accuracy of results.

Observing over time



To ask a range of questions and identify the type of enquiry that will help to answer the questions. Then, to ask further questions based on results..

Recognise and control variables where necessary.

Make observations linked to answering the question.

When appropriate, measure using standard units where all the numbers are marked on the scale.

Prepare own tables to record own data.

Choose an appropriate form of presentation including line graphs.

Be able to answer their questions describing the change over time.

Provide oral or written explanations for their findings..

Use test results to make predictions for further investigations.

Suggest improvements e.g. method of taking measurements. Suggest new questions arising from the investigation.

Pattern seeking



To ask a range of questions and identify the type of enquiry that will help to answer the questions. Then, to ask further questions based on results.

Recognise and control variables where necessary.

Make observations linked to answering the question.

When appropriate, measure using standard units where all the numbers are marked on the scale.

Prepare own tables.

Choose an appropriate form of presentation including scatter graphs..

Be able to answer their questions identifying patterns.

Provide oral or written explanations for their findings..

Use test results to make predictions for further investigations

Suggest improvements e.g. method of taking measurements. Suggest new questions arising from the investigation.