

SCIENCE WORKING SCIENTIFICALLY



Newlands Junior School
We are Proud



	Below Y3	Y3/4	Y5/6
	National curriculum Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions	National curriculum Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • 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 • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes • using straightforward scientific evidence to answer questions or to support their findings	National curriculum Pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • 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 • identifying scientific evidence that has been used to support or refute ideas or arguments

	Below Y3	Year 3	Year 4	Year 5	Year 6
Questioning	Ask 'why' and 'what' questions.	Use knowledge and understanding to ask 'why' and 'what if' questions.		Use knowledge and understanding to ask 'how' and 'when' questions.	
Labelled diagrams	Draw and label a given diagram with scientific vocabulary	Draw and label my own diagram with given scientific vocabulary		Draw, label and annotate my own diagrams using scientific vocabulary and information.	
Explaining	Recall relevant scientific facts and construct an oral sentence using scientific vocabulary.	Use scientific facts, knowledge and vocabulary to describe and explain, putting these into oral/written sentences. Describe simple models/diagrams.		Show secure knowledge and understanding of ideas and concepts. Accurately use scientific words in oral and written explanations. Begin to use scientific models to explain.	
Identifying	Identify and name simple scientific things, ideas and processes.	Identify and describe changes in scientific processes and ideas.		Use knowledge, understanding and secondary sources to identify unknown scientific things, ideas and processes.	
Classifying	Group by similarity or difference Sort using simple yes/no statements.	Use multiple groups when sorting.	Create and explain my own criteria for sorting. Construct a simple classification key.	Create my own criteria for sorting, which includes a sub-group. Construct a classification key.	Create my own criteria for sorting, which includes multiple sub-groups. Construct and explain a classification key.
Comparing	Identify similarities and differences.	Identify similarities and differences. Identify when/how properties change.		Explain how and why properties change and some don't.	
Scientific evidence	Begin to select relevant scientific facts to use in an answer	Use scientific evidence to answer questions or to support their findings.		Identifying scientific evidence that has been used to support or refute ideas.	
Enquiry Questions	Ask 'why' and 'what' questions.	Ask relevant questions to investigate.		Use my knowledge and understanding to ask questions we can investigate.	
Predicting	Suggest what might happen.	Use scientific knowledge to predict what might happen in an investigation.		Predict cause and effect (causal) and use knowledge to justify this.	
Enquiry	Follow instructions for a practical enquiry including fair testing.	Set up practical enquiries including fair testing		Set up practical enquiries including fair and comparative testing, identifying and classifying, observation over time and pattern seeking.	
Equipment	Use a range of scientific equipment and begin to recognise common dangers.	Select and begin to independently use a range of equipment for a given task, including thermometers and data loggers. Recognise common dangers and act on safety suggestions.		Select equipment for a task and justify my choices. Describe the safe use of equipment and explain how you can plan to control risks.	
Fair and comparative testing	Compare one thing with another	Observe or measure the effect that changing one variable has on another whilst attempting to keep other variables constant in appropriate tests.		Plan and carry out a reliable and fair test ensuring the controlled variables are kept the same.	
Pattern and relationships	Recognise, create and describe simple patterns.	Describe simple patterns in data in a table.	Describe simple patterns in data, tables and graphs.	Describe patterns, trends and relationships in data.	Describe and compare patterns, trends and relationships in data.
	Use 'more' or 'less' to compare observations.	Use 'more' or 'less' to compare observations.	Identify differences in sets of data.	Identify and explain differences in sets of data.	Identify and explain differences in sets of repeated data.
Reviewing	Explore different ways to do things.	Identify weaknesses in my methods.	Identify weaknesses in my methods and suggest improvements.	Identify how limitations in my methods might affect my results and suggest improvements.	Identify limitations in my methods and use my results to justify improvements.
Recording/Results	Complete a given table or bar chart.	Bar charts, Tables, Classification keys Making observations and gather evidence, where appropriate, taking accurate measurements using standard units.		Classification keys, Tables, Bar/line graphs Taking measurements with increasing accuracy, taking repeated readings.	
Concluding		Summarise findings linking back to the investigation. Suggest improvements and raise further questions about the investigation.		Summarise findings linking back to the question, prediction and fair test. Use results to identify further possible investigations.	

Writing up a scientific investigation

Y3	Y4	Y5	Y6
Question – why, what if Equipment Labelled diagram Prediction Fair test Variables Method Results (table/graph) Conclusion (suggest improvements)	Question – why, what if Equipment Labelled diagram Prediction Fair test Variables Method Results (table/graph) Conclusion (suggest improvements)	Question Equipment Labelled diagram Prediction (cause and effect/trend) Fair and comparative test Variables Method (limitations) Results – patterns, trends, relationships (table/graph) Conclusion – make predictions for further tests	Question Equipment Labelled diagram Prediction (cause and effect/trend) Fair and comparative test Variables Method (limitations) Results – patterns, trends, relationships (table/graph) Conclusion – make predictions for further tests