Attleborough Primary School

Achieve Collaborate Flourish

Science Progression of Skills – Working Scientifically

Early Learning Goals Prime areas and how they link to investigative skills in the science curriculum.	KS1 National Curriculum requirements During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	Lower KS2 National Curriculum requirements During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:	Upper KS2 National Curriculum requirements During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:
ELG: Listening, Attention and Understanding - Listen attentively and respond to what they hear with relevant questions, - Make comments about what they have heard and ask questions to clarify their understanding; **ELG: Speaking** Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary; - Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate; - Express their ideas and feelings about their experiences using full sentences, **ELG: Self-Regulation** show an ability to follow instructions involving several ideas or actions **ELG: Building Relationships** - Work and play cooperatively and take turns with others; **ELG: Fine Motor Skills** - Begin to show accuracy and care when drawing. **ELG: Creating with Materials** - Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function; **ELG: The Natural World Children** - Explore the natural world around them, making observations and drawing pictures of animals and plants;	• 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.	• 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.	• 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.

Working Scientifically	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Planning Investigations	Pupil can, with prompting, ask simple questions that can be tested, e.g. about plants growing in their habitat. Pupil can offer ways of gathering evidence to answer a question, e.g. by deciding on the best material to use for a particular application.	Pupil can ask simple questions that can be tested, e.g. about the local environment and how organisms depend on each other. Pupil can suggest different ways of answering a question, e.g. testing the suitability of materials for different purposes.	Pupil can, with support, develop relevant, testable questions, e.g. what happens to shadows when the light source moves. Pupil can plan enquiry, such as comparative or fair test, e.g. comparing the effect of different factors on plant growth. Pupil can set up a comparative test, e.g. how far things move on different surfaces.	Pupil can develop relevant, testable questions, e.g. based on observations of animals. Pupil can plan investigations using different types of scientific enquiry, e.g. exploring various materials by observing change over time, running comparative tests and conducting surveys. Pupil can set up comparative and fair tests, e.g. finding patterns in the sounds made by elastic bands of different thicknesses.	Pupil can, with support, can answer questions using evidence gathered from different types of scientific enquiry, e.g. comparing life cycles of different plants using change over time, surveys and secondary research. Pupil can, with prompting, identifies and manages variables, e.g. when exploring falling paper cones.	Pupil can answer questions using evidence gathered from different types of scientific enquiry, e.g. operation of circulatory system from experiment, survey and secondary research. Pupil can identify and manage variables, e.g. distances and sizes in shadow formation.
Conducting experiments	Pupil can examine objects to note key features, e.g. observe growth of plants they have planted. Pupil can, with support, conduct simple tests, e.g. comparing the properties of different materials.	Pupil can examine carefully, e.g. using a hand lens Pupil can conduct simple tests, e.g. setting up comparative tests to show that plants need water and light.	Pupil can use various equipment, as instructed, e.g. using a hand lens to examine rocks. Pupil can use standard measurements when taking measurements, e.g. measuring distances between a light source and an object.	Pupil can use various equipment, as instructed, repeatedly and with care, e.g. thermometers. Pupil can recognise the importance of using standard units and measures accurately, e.g. measuring temperature when investigating its effect on washing drying.	Pupil can, following discussion of alternatives, selects appropriate equipment, e.g. using a shadow stick and measuring length and angle of shadow. Pupil can take measurements that are precise as well as accurate, e.g. measuring the force needed to pull different shapes of boat through the water. Pupil can know how to process repeat readings, e.g. when timing falling objects.	Pupil can use appropriate equipment, such as meter rule, to take measurements, such as distance travelled by light. Pupil can consider how by modifying instrument or technique, measurements can be improved, e.g. when recording route of light rays. Pupil can identify situations in which taking repeat readings will improve the quality of evidence, e.g. investigating the behaviour of components in a circuit.
Recording evidence	Pupil can, with prompting, identify what might usefully be recorded, e.g. drawing structures of plants or recording changing day length.	Pupil can, with assistance, draw and label diagrams, e.g. recording plants changing over time, starting from seed or bulb.	Pupil can, with prompting, draw and label diagrams, e.g. to show how water travels in a plant. Pupil can, with prompting, use tables to record evidence, e.g. recording what happens when various rocks are rubbed together Pupil can, with prompting, gather and display evidence in various ways, e.g. about the ways that magnets behave in relation to each other.	Pupil can use words and diagrams to record findings, e.g. how habitats change during the year. Pupil can use various ways to record evidence, e.g. comparing the teeth of herbivores and carnivores Pupil can use various ways to record, group and display evidence, e.g. grouping and classifying various materials.	Pupil can start to use labelled diagrams to show more complex outcomes, e.g. comparing the time of day at different places on the earth. Pupil can, with prompting, use various ways to record complex evidence, e.g. when investigating how gears and levers enable a small force to have a larger effect. Pupil can use a line graph to record basic data, e.g. length and mass of a baby as it grows.	Pupil can use labelled diagrams to show complex outcomes, e.g. relating specific adaptations of organisms to environmental factors. Pupil can use various ways, as appropriate, to record complex evidence, e.g. in the construction of a key to aid plant identification. Pupil can use line graphs to display complex data, e.g. size of object in relation to the size of the shadow it casts.

Reporting findings	Pupil can identify key findings from an enquiry, e.g. noting how plants have changed over time.	Pupil can identify and group key outcomes from enquiry, e.g. describing conditions in different habitats and how these affect the numbers and types of organisms.	Pupil can, with prompting, write a conclusion based on evidence, e.g. exploring the strengths of different magnets. Pupil can indicate findings from an enquiry that could be reported, e.g. answering questions about how rocks are formed.	Pupil can write a conclusion based on evidence, e.g. effect on brightness of bulbs if more cells are added. Pupil can present findings either in writing or orally, e.g. relating to investigating which materials are conductors.	Pupil can, with prompting, write a conclusion using evidence and identifying causal links, e.g. investigating what makes a parachute fall quicker. Pupil can, with support, display and present key findings from enquiries orally and in writing, e.g. suggesting reasons for similarities and differences between various animals. Pupil can, with support, indicate why some results may not be entirely trustworthy, e.g. when timing falling objects.	Pupil can write a conclusion using evidence and identifying causal links, e.g. in the design of a periscope. Pupil can display and present key findings from enquiries orally and in writing, e.g. deciding how well classifications fit unfamiliar animals and plants. Pupil can, in conclusions, indicate how trustworthy they are, e.g. in relating brightness of bulb to voltage supplied.
Conclusions and predictions	Pupil can collect data, e.g. comparing and contrasting familiar plants. Pupil can suggest answers to enquiry questions using data, e.g. describe how to group plants.	Pupil can collect data relevant to the answering of questions, e.g. seeing how the shapes of some materials can be changed. Pupil can answer enquiry questions using data and ideas, e.g. to help decide how the properties of certain materials make them suitable for certain applications.	Pupil can, with prompting, recognise patterns that relate to scientific ideas, e.g. investigating the behaviour of magnets. Pupil can, with support, use evidence to produce a simple conclusion, e.g. the changes that occur when rocks are in water. Pupil can suggest how an investigation could be extended, e.g. suggesting creative uses for different magnets.	Pupil can recognise patterns that relate to scientific ideas, e.g. finding out which materials make better earmuffs. Pupil can use evidence to produce a simple conclusion, e.g. the effect of temperature on various substances. Pupil can use evidence to suggest further relevant investigations, e.g. making own instruments, using ideas about pitch and volume.	Pupil can show how evidence supports a conclusion, e.g. researching gestation periods of various mammals and relating them to adult mass. Pupil can suggest further relevant comparative or fair tests, e.g. when testing materials for various properties to determine their suitability for an application	Pupil can identify how an idea is supported or refuted by evidence, e.g. selective breeding to produce animals or plants with desirable characteristics. Pupil can use evidence to suggest further comparative or fair tests that would develop the investigation, e.g. in the design of rear view mirrors for cars.

'Working scientifically' is described separately in the programme of study, but must **always** be taught through and clearly related to the teaching of substantive science content in the programme of study.