

Science Scientific Enquiry Progression

(Ref: White Rose science from Year 1 to 6. The following aims are made with reference to White Rose Science, linked with the national curriculum, ELG and Development Matters)



Science activities provide children with opportunities to develop and practice many different skills and attributes. These include communication skills, collaborative skills, team working and perseverance, as well as analytical, reasoning and problem-solving skills. Although inquiry and the scientific method are integral to science education and practice, every decision we make is based on these processes. ... In this way, science is one of the most important subjects children experience, because it gives them the critical thinking skills they need in every subject.

Aims: At Dale Hall it is our aim to develop a lifelong curiosity and interest in the sciences. We intend to give the children the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they will build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions.

EYFS

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The aim of this document is to help subject leaders to understand how the skills taught across EYFS feed into national curriculum subjects.

These statements from the 2020 Development Matters are prerequisite skills for science within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for science.

The most relevant statements for science are taken from the following areas of learning:

- Communication and Language
- Personal, Social and Emotional Development
- Understanding the World

Three & Four Year olds	Communication and Language	Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.
Reception	Communication and Language	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. Use new vocabulary in different contexts.
	Personal, Social and Emotional Development	• Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time'

			- having a good sleep routine -Being a safe pedestrian
	Understanding the World		• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. Understand the effect of changing seasons on the natural world around them.
ELG	Communication and Language	Listening, Attention and Understanding	Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.
	Understanding the World	The Natural World	• Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Questioning	Ask simple questions.	Ask simple questions and recognising that they can be answered in different ways.	Ask questions and understand there are different types of scientific enquiry to answer them.	Ask relevant questions and using different types of scientific enquiries to answer them.	Ask scientific questions and begin to understand which questions would be best suited to each enquiry type.	Ask relevant scientific questions and choose which enquiry type would be best suited to answer them.
Observations	Observe closely.	Observe closely, using simple equipment.	Begin to use scientific equipment to make observations.	Make systematic and careful observations.	Use a range of scientific equipment to make systematic and careful observations.	Use a range of scientific equipment to make systematic and careful observations with increased complexity.
Planning	Verbally state what they are going to investigate.	Make simple predictions based on a question. Identify what they will change and keep the same.	Make relevant predictions. Identify what they will change, observe and keep the same. With support set up simple practical enquiries.	Make predictions based on simple scientific knowledge. Identify what they will change, observe or measure and keep the same. Set up simple practical enquiries, comparative and fair tests.	Make predictions based on scientific knowledge. With support, plan different types of scientific enquiry. Where appropriate identify the dependent, independent and controlled variables.	Make predictions based on scientific knowledge. Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
Take measurements	Carry out simple tests using non-standard measurements where appropriate.	Perform simple tests using standard units when appropriate.	Carry out tests and simple experiments and take measurements using standard units.	Take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Take accurate measurements using a range of scientific equipment. Start to take repeat readings where appropriate.	Take accurate measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings where appropriate.

Gather, Record and Classify Data.	Gather and record simple data. Sort objects and living things into groups based on simple properties.	Gather and record Data to help in answering questions. Identify and classify.	Gather and record data in different ways to help answer questions. Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables.	Gather, record and classify data in a variety of ways to help in answering questions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Gather, record and classify data with increasing complexity to help in answering questions. Record data using scientific diagrams and labels, classification keys, tables, bar and line graphs.	Record data and results of increasing complexity using scientific diagrams and labels, scatter graphs, bar and line graphs.
Present Findings	Explain what they found out to an adult or partner.	Talk about what they have found out and how they found it out.	Report on findings from enquiries, including oral and written explanations.	Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	Report on findings from enquiries, including conclusions. Begin to identify causal relationships in oral and written forms such as displays and other presentations.	Report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such a displays and other presentations.
Answer questions and make conclusions.	Answer simple questions.	Use their observations and ideas to suggest answers to questions.	Make simple conclusions. Use results, findings or observations to answer questions.	Use straight forward scientific evidence to answers questions or support findings. Use results to draw simple conclusions. Begin to identify differences, similarities or changes related simple ideas or processes.	Use scientific evidence to answer questions. Make conclusions based on scientific evidence and form their own testing and findings. Identify differences, similarities or changes related to simple ideas or processes.	Use scientific evidence to answer questions. Make conclusions based on scientific evidence and form their own testing and findings. Identify scientific evidence that has been used to support or refute ideas or arguments.

Evaluate			Suggest questions for further investigation.	Begin to make predictions for new values, suggest improvements and raise further questions.	Make predictions for new values, suggest improvements and raise further questions.	Use test results to make predictions to set up further comparative and fair tests. Suggest investigation improvements including accuracy of results. Provide some simple examples of how to extend the investigation.
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