

What does Science look like in Early Years?

Guidance for subject leaders

The EYFS statutory framework has been updated and the revised document will need to be used in all early years' settings and schools from September 2021. It is important that subject leaders understand what their specialist subject looks like in early years; how key knowledge and skills are taught and what progression through these may look like. There is no requirement for schools to adopt a particular teaching style or method and the school curriculum as a whole needs to be considered, so it meets the needs of your children, families and community. The ELG should not be seen as your curriculum as this very narrow, merely a checkpoint for the end of the reception year. The revised EYFS still has seven areas of learning, rather than the individual subjects used within the National Curriculum but this document will highlight the main links between the two. Communication and Language development is key and is a 'golden thread' which runs through and underpins all other areas of learning, as does Personal, Social and Emotional Development. The statutory framework is supported by two non-statutory documents which schools can choose to use ('Development Matters' and 'Birth to Five Matters'). The table below shows where learning in early years links to the NC programme of study in Science. These statements are basics upon which to build your full curriculum.



Development Matters		Birth to 5 Matters	
Birth to Three – Babies and young toddlers will be learning to:	Understanding the world Repeat actions that have an effect. Explore materials with different properties. Explore natural materials, indoors and outside. Communication and language Understand simple questions about 'who', 'what' and 'where' (but generally not 'why'). Mathematics Compare sizes, weights etc. using gesture and language -'bigger/little/smaller', high/low', 'tall', 'heavy'.	Range 1	
		Range 2	Understanding the world Closely observes what animals, people and vehicles do. Watches toy being hidden and tries to find it. Looks for dropped objects.

Development Matters		Birth to 5 Matters	
3 and 4 year olds will be learning to:	<p>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. 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. Explore and talk about different forces they can feel. Talk about the differences between materials and changes they notice.</p> <p>Communication and language Understand 'why' questions, like: "Why do you think the caterpillar got so fat?" Be able to express a point of view and to debate when they disagree with an adult or a friend, using words as well as actions.</p>	Range 3	
		Range 4	<p>Communication and language Understands 'who', 'what', 'where' in simple questions (e.g. Who's that/can? What's that? Where is?) Developing understanding of simple concepts (e.g. big/little). Uses a variety of questions (e.g. what, where, who).</p> <p>Understanding the world Notices detailed features of objects in their environment.</p>
Children in reception will be learning to:	<p>Understanding the world Explore the natural world around them. Describe what they see, hear and feel whilst outside. Understand the effect of changing seasons on the natural world around them.</p> <p>Communication and language Learn new vocabulary. Ask questions to find out more and to check they understand what has been said to them. Articulate their ideas and thoughts in well-formed sentences. Engage in non-fiction books. Listen to and talk about selected non-fiction to develop a deep familiarity with new knowledge and vocabulary. Describe events in some detail. Use talk to help work out problems and organise thinking and activities explain how things work and why they might happen.</p>	Range 5	<p>Communication and language Beginning to understand 'why' and 'how' questions.</p> <p>Understanding the world Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Talks about why things happen and how things work. Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. Begin to understand the effect their behaviour can have on the environment</p>

Development Matters		Birth to 5 Matters	
		Range 6	<p>Communication and language Understands questions such as 'who; why; when; where and how'.</p> <p>Understanding the word Looks closely at similarities, differences, patterns and change Knows about similarities and differences in relation to places, objects, materials and living things. Talks about the features of their own immediate environment and how environments might vary from one another Makes observations of animals and plants and explains why some things occur, and talks about changes.</p> <p>Physical Development Describes a range of different food textures and tastes when cooking and notices changes when they are combined or exposed to hot and cold temperatures. Describes physical changes to the body that can occur when feeling unwell, anxious, tired, angry or sad. Shows some understanding that good practices with regard to exercise, eating, drinking water, sleeping and hygiene can contribute to good health.</p>
<p>Early Learning Goal Statutory ELG: The Natural World Children at the expected level of development will:</p> <ul style="list-style-type: none"> - 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. <p>Statutory ELG: Communication and Language: Listening, Attention and Understanding</p> <ul style="list-style-type: none"> - Make comments about what they have heard and ask questions to clarify their understanding. 			

Characteristics of Effective Learning

In planning and guiding what children learn, practitioners must reflect on the different rates at which children are developing and adjust their practice appropriately. Three characteristics of effective teaching and learning are:

- Playing and exploring - children investigate and experience things, and 'have a go'
- Active learning - children concentrate and keep on trying if they encounter difficulties, and enjoy achievements
- Creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things

Characteristics which may support future learning in Science

Playing and Exploring	Active Learning	Creating and thinking critically
<p>Development Matters Reach for and accept objects. Make choices and explore different resources and materials. Bring their own interests and fascinations into early years settings. This helps them to develop their learning. Respond to new experiences that you bring to their attention.</p> <p>Birth to 5 Matters Showing curiosity about objects, events and people. Using senses to explore the world around them. Taking a risk, engaging in new experiences, and learning by trial and error.</p>	<p>Birth to 5 Matters Showing a deep drive to know more about people and their world. Showing high levels of involvement, energy, fascination. Paying attention to details.</p>	<p>Development Matters Know more, so feel confident about coming up with their own ideas. Make more links between those ideas.</p> <p>Birth to 5 Matters Thinking of ideas that are new and meaningful to the child. Playing with possibilities (what if? what else?) Visualising and imagining options. Making links and noticing patterns in their experience. Making predictions. Testing their ideas. Developing ideas of grouping, sequences, cause and effect. Planning, making decisions about how to approach a task, solve a problem and reach a goal. Checking how well their activities are going. Flexibly changing strategy as needed. Reviewing how well the approach worked.</p>

What does Science look like in Early Years?

Science is a broad and exciting subject for children, who are naturally curious and have questioning minds. It is important that a wide range of experiences are introduced to children in the early years so that they can begin to develop their scientific knowledge. Inquisitive children can easily be encouraged to find things out for themselves by carrying out simple experiments, making observations, and sharing their discoveries.

Science has close links with the specific area of learning 'Understanding the World'.

'Understanding the World provides a powerful, meaningful context for learning across the curriculum. It supports children to make sense of their expanding world and their place within it through nurturing their wonderment, curiosity, agency and exploratory drive.... first-hand involvement in caring for wildlife and the natural world provides children with an appreciation of ecological balance, environmental care and the need to live sustainable lives' Birth to 5 Matters

What Science might look like in Early Years, including in Indoor and Outdoor Provision







What you might see children doing	What you should see practitioners doing
<ul style="list-style-type: none"> • Sharing knowledge linked to scientific interests. • Sharing books about the world, weather, the environment, growing, the human body etc. • Talking about how we can look after our planet. • Investigating how different materials can be used and changed. • Growing plants from seeds and caring for plants. • Talking about how we can look after our planet. • Exploring how materials can be changed through cooking activities. • Closely observing minibeasts and animals. • Noticing and talking about the changing seasons. • Investigating objects which float and sink during water play. • Using basic scientific vocabulary. • Explaining how things will work or what will happen. • Investigating and talking about how things change over time, for example, as ice melts. • Showing interest in and learning about life cycles. • Recording the local weather. • Recreates animal habitats through creative activities or role play. • Representing science based learning in writing and creative and digital mediums. • Starting to record scientific data using tallies and numerical/pictorial representations. • Exploring how their body works during exercise. • Investigating how magnets work by using magnetic construction kits. • Using all their senses to explore food. 	<ul style="list-style-type: none"> • Introducing basic scientific vocabulary. • Teaching children how to keep themselves safe whilst exploring scientific ideas. • Asking appropriate questions and providing answers so children develop knowledge of the world around them. • Inspiring children to be curious about the world around them. • Teaching early skills of scientific enquiry and investigation. • Promoting a sense of awe and wonder in relation to the natural world. • Providing a science rich environment with lots of different resources to explore. • Considering prior learning when planning opportunities. • Considering children's interests • Using the local environment as a teaching resource. • Sharing knowledge about things we can do to protect our planet. • Encouraging children to say what they think and give their ideas. • Providing opportunities for simple field work skills to be taught and applied. • Providing opportunities to help care for the local environment. • Specifically teaching early scientific concepts. • Providing opportunities to complete simple experiments and record results.

The Curriculum – What we want children to learn (Taken from Development Matters)

The curriculum is a top-level plan of everything the early years setting wants the children to learn.

- Planning to help every child to develop their language is vital.
- The curriculum needs to be ambitious. Careful sequencing will help children to build their learning over time.
- Young children's learning is often driven by their interests. Plans need to be flexible.
- Babies and young children do not develop in a fixed way. Their development is like a spider's web with many strands, not a straight line.
- Depth in early learning is much more important than covering lots of things in a superficial way.

Progression

		Knowledge	Growing	Bodies	Weather/seasons	Materials	Changes in materials
2-year room		Starts to acquire basic information shared by adults in provision and through simple activities.	Takes part in growing activities alongside an adult e.g. watering plants.	Can point to and name some body parts.	Notices the weather by jumping in puddles, building snowmen, twirling in autumn leaves etc.	Explores a wide range of different materials provided in provision.	Participates in cooking activities and explores melting ice.
Nursery/Pre-school							
Reception Class		Asks questions to clarify understanding and actively engages in scientific enquiry,	Can follow instructions to plant a seed and knows how to care for plants.	Talks about how their body responds to exercise. Names body parts and their function.	Can talk about and record features of the weather and seasons. Uses books/ technology to find information.	Can describe different materials and talk about what they would be useful for.	Completes simple investigations with adult support. Uses some scientific language.

Assessment in Early Years

As in the previous version of the EYFS the ELGS are not to be used or envisaged as a curriculum. The EYFS clearly states 'The ELGS are there to support teachers to make a holistic, best-fit judgement about a child's development and their readiness for Year One'. Observation checkpoints are included in Development Matters to support practitioners when considering whether children are on track or if additional support is needed.

'Assessment should not entail prolonged breaks from interaction with children, nor require excessive paperwork. When assessing whether an individual child is at the expected level of development, practitioners should draw on their knowledge of the child and their own expert professional judgement and should not be required to prove this through collection of physical evidence- Statutory Framework for EYFS 2.2' (See document for more information about assessment, including the three statutory assessments in EY).

Useful links

Statutory framework for the Early Years Foundation Stage

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/974907/EYFS_framework_-_March_2021.pdf

Development Matters

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/971620/Development_Matters.pdf

Birth to Five Matters

<https://www.birthto5matters.org.uk/#:~:text=%20Birth%20to%205%20Matters%3A%20non-statutory%20guidance%20for%20the,Years%20Coalition%2C%20composed%20of%20the%20following...%20More%20>

Please note: This document is not to be used as a tick list for assessment or planning purposes. Its aim is to support with understanding the revised Statutory Framework and accompanying non-statutory guidance documents. These documents may also be useful for mixed age teachers, new to EY teachers, senior leaders and governors – Cumbria County Council Early Years Team.