



Key Knowledge, Skills and Understanding for Science

EYFS

Key Knowledge and Skills

This document demonstrates which 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 DT.

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

Key Skills and Understanding

Three and Four-Year-Olds	Communication and Language	<ul style="list-style-type: none"> • Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"
	Personal, Social and Emotional Development	<ul style="list-style-type: none"> • Make healthy choices about food, drink, activity and toothbrushing.
	Understanding the World	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Learn new vocabulary. • Ask questions to find out more and to check what has been said to them.



			<ul style="list-style-type: none"> • 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		<ul style="list-style-type: none"> • Know and talk about the different factors that support their overall health and wellbeing: <ul style="list-style-type: none"> ○ regular physical activity ○ healthy eating ○ toothbrushing ○ sensible amounts of 'screen time' ○ having a good sleep routine • being a safe pedestrian
	Understanding the World		<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding.
	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> • 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	<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.



Key Knowledge, Skills and Understanding for Science

Year 1

Key Knowledge

Seasonal Changes - How do the seasons impact on what we do?

- Do they know the names of the four seasons?
- Do they know the type of weather associated with each of the four seasons?
- Do they know at least 2 activities that they could do in each of the four seasons?

Seasonal Changes - Why does it get darker earlier in winter?

- Do they know the name of a source of light such as a torch, candle, lightbulb or the sun?
- Do they know that the sun is a source of light that lights up the Earth?

Plants/Animals - Which birds and plants would Little Red Riding Hood find in our park?

- Do they know that a deciduous tree loses its leaves in the Autumn and an evergreen tree keeps its leaves all year round?
- Do they know where the petals, stem, leaves and roots are found on a plant?
- Do they know that plants and trees need water, sunlight and soil to grow?
- Do they know that animals need food, water, sunlight and shelter to survive?

Everyday Materials - What do aliens think of life on planet Earth?

- Do they know the name of the material(s) that an object is made from such as plastic, wood or fabric?
- Do they know that fabric is a suitable material for an umbrella because it is light and waterproof? (Working Scientifically).
- Do they know the meaning of transparent and opaque?

Animals - Why are humans not like tigers?

- Do they know how to classify a range of animals by fish, amphibians, reptiles, birds and mammals?
- Do they know that animals who eat plants are herbivores, meat eaters are carnivores and animals that eat both plants and meat are omnivores?
- Do they know how to identify key parts of the human body such as their arm, leg and head?

Key Skills and Understanding

	Observing closely	Performing Tests	Identifying and Classifying	Recording Findings
Expected	<ul style="list-style-type: none"> • Can they talk about what they see, touch, smell, hear or taste? • Can they use simple equipment to help them make observations? 	<ul style="list-style-type: none"> • Can they perform a simple test? • Can they tell other people about what they have done? 	<ul style="list-style-type: none"> • Can they identify and classify things they observe? • Can they think of some questions to ask? • Can they answer some scientific questions? • Can they give a simple reason for their answers? • Can they explain what they have found out? 	<ul style="list-style-type: none"> • Can they show their work using pictures, labels and captions? • Can they record their findings using standard units? • Can they put some information in a chart or table?
Exceeding	<ul style="list-style-type: none"> • Can they find out by watching, listening, tasting, smelling and touching? 	<ul style="list-style-type: none"> • Can they give a simple reason for their answers? 	<ul style="list-style-type: none"> • Can they talk about similarities and differences? • Can they explain what they have found out using scientific vocabulary? 	<ul style="list-style-type: none"> • Can they use ICT to show their working? • Can they make accurate measurements?





Key Knowledge, Skills and Understanding for Science

Year 2

Key Knowledge

Forces - Could you be the next Lightning McQueen?

- Do they know that they can use their senses; see, touch smell, taste or hear, to help them answer questions?
- Do they know that a 'push' force is the opposite to a 'pull' force?

Sound – Where did that racket come from?

- Do they know the difference between a loud and quiet sound?
- Do they know that sound travels through vibrations?
- Do they know that distance affects the volume of a sound?

Everyday materials – What is your house made of?

- Do they know that a man-made material has been made by humans?
- Do they know how materials can be changed by squashing, bending, twisting and stretching? (Working Scientifically)
- Do they know that plastic is waterproof?

Living Things and Habitats – Location Location Location!

- Do they know that things can be sorted and classified according to whether they are living, dead or were never alive? (Working Scientifically)
- Do they know what animals could live in a desert, ocean, rainforest, woodland and arctic habitat?
- Do they know that all plants and animals that live in a habitat are dependent on each other for food?

Animals and Human Beings – Will 5 a day help me to stay healthy?

- Do they know that adult animals produce offspring?
- Do they know that all living things need food, water and air to survive?
- Do they know why it is important to eat a balanced diet, exercise and practise good hygiene?

Plants – How can I grow my own salad?

- Do they know that a plant needs water, light and a suitable temperature to grow and stay healthy?
- Do they know that 'germination' means the phase of plant growth?
- Do they know that a bulb contains a food source for the plant?

Key Skills and Understanding

	Observing closely	Performing Tests	Identifying and Classifying	Recording Findings
Expected	<ul style="list-style-type: none"> • Can they use see, touch, smell, hear or taste to help them answer questions? • Can they use some scientific words to describe what they have seen and measured? • Can they compare several things? 	<ul style="list-style-type: none"> • Can they carry out a simple fair test? • Can they explain why it might not be fair to compare two things? • Can they say whether things happened as they expected? • Can they suggest how to find things out? • Can they use prompts to find things out? 	<ul style="list-style-type: none"> • Can they organise things into groups? • Can they find simple patterns (or associations)? • Can they identify animals and plants by a specific criteria e.g. lay eggs or not; have feathers or not? 	<ul style="list-style-type: none"> • Can they use text, diagrams, pictures, charts, tables to record their observations? • Can they measure using simple equipment?



Exceeding	<ul style="list-style-type: none"> • Can they suggest ways of finding out through listening, hearing, smelling, touching and tasting? 	<ul style="list-style-type: none"> • Can they say whether things happened as they expected and if not why not? 	<ul style="list-style-type: none"> • Can they suggest more than one way of grouping animals and plants and explain their reasons? 	<ul style="list-style-type: none"> • Can they use information from books and online information to find things out?
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Key Knowledge, Skills and Understanding for Science

Year 3

Key Knowledge

Magnets and forces – Are you attractive enough?

- Do they know that magnets have two poles: north and south?
- Do they know that the same poles repel (north and north, south and south) and the opposite poles attract (north and south)?
- Do they know that iron, nickel and cobalt are three magnetic metals?
- Do they know that a force can make an object move without direct contact? (gravity)
- Do they know that they can record their information in charts, tables and graphs? (e.g. magnetic and non-magnetic materials) (Working Scientifically)

Light and dark – How far can you throw your shadow?

- Do they know that they need light to see things and that dark is the absence of light?
- Do they know that shadows are formed when the light from a light source is blocked by a solid object?
- Do they know that the closer the object is to the light source, the larger the shadow will be and the further away the object is from the light source, the smaller the shadow will be?
- Do they know that light is reflected from surfaces into our eyes so that we can see?

Animals including humans – How can Usain Bolt move so quickly?

- Do they know the names of the five main food groups? (carbohydrates, protein, dairy, fruit and vegetables, sugar and fat)
- Do they know that animals, including humans, cannot make their own food; they get nutrition from what they eat?
- Do they know that when we are born, we have approximately 300 bones and by the time we are adults, we have 206 bones because some bones have fused together?
- Do they know that humans have a skeleton and muscles for support, protection and movement?

Plants - How did that blossom become an apple?

- Do they know that light, air, water, nutrients from soil are all important for plant growth?
- Do they know that water and nutrients are absorbed through the plants roots and transported along the stem to different parts of the plant?
- Do they know how insects help to pollinate flowers?
- Do they know that seeds from a plant can be dispersed by wind, water, birds and animals?
- Do they know that when planning an investigation to test the best conditions for plant growth, it must be fair? (Working Scientifically)

Rocks - What do rocks tell us about the way the Earth was formed?

- Do they know that concrete is a manmade rock?
- Do they know that Igneous rocks are formed when magma or lava cools, Sedimentary rocks are formed when sand, mud, dead plants and animals are squashed together under the sea and Metamorphic rocks are Igneous or Sedimentary rocks that have been heated up and changed by magma?
- Do they know that soil is made from small pieces of rock and decaying organic matter, such as dead plants or animals?



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Key Skills and Understanding

	Planning	Obtaining and presenting evidence	Considering evidence and evaluating
Expected	<ul style="list-style-type: none"> • Can they use different ideas and suggest how to find something out? • Can they make and record a prediction before testing? • Can they plan a fair test and explain why it was fair? • Can they set up a simple fair test to make comparisons? • Can they explain why they need to collect information to answer a question? 	<ul style="list-style-type: none"> • Can they measure using different equipment and units of measure? • Can they record their observations in different ways? (labelled diagrams, charts etc) • Can they describe what they have found using scientific language? • Can they make accurate measurements using standard units? 	<ul style="list-style-type: none"> • Can they explain what they have found out and use their measurements to say whether it helps to answer their question? • Can they use a range of equipment (including a data-logger) in a simple test?
Exceeding	<ul style="list-style-type: none"> • Can they record and present what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? 	<ul style="list-style-type: none"> • Can they explain their findings in different ways (display, presentation, writing)? • Can they use their findings to draw a simple conclusion? • Can they suggest improvements and predictions for further tests? 	<ul style="list-style-type: none"> • Can they suggest how to improve their work if they did it again?





Key Knowledge, Skills and Understanding for Science

Year 4

Key Knowledge

States of Matter - How would you survive without water?

- Do they know that water can exist in three forms: liquid (water), solid (ice) or gas (water vapour)?
- Do they know the different stages of the water cycle and explain it using the terms condensation, evaporation and precipitation?
- Do they know that some materials change state when they are heated or cooled?

Electricity - How could we cope with no electricity for one day?

- Do they know that a simple series electrical circuit can be constructed using cells, wires, bulbs, switches and buzzers?
- Do they know that metals are good conductors?
- Do they know Electricity can be generated from power stations, wind, the sun, water and other renewable methods?

Sounds - Why is the sound made by Ed Sheeran Loved by so many?

- Do they know sound comes from vibrations which create sound waves which move through mediums such as air and water before reaching our ears?
- Do they know the correlation between pitch and the object producing a sound?
- Do they know the correlation between the volume of a sound and the strength of the vibrations that produced it?

Animals, including humans - What happens to the food we eat?

- Do they know that the front teeth are called incisors, the four sharp teeth are called canines, the teeth at the back are called molars and their functions?
- Do they know the names and functions of the basic parts of the digestive system in humans?
- Do they know what a food chain is and identify producers, predators and prey?

Living things and their habitats - Which wild animals and plants thrive in your locality?

- Do they know that a vertebrate is classified as an animal with a backbone and an invertebrate is an animal with a soft body?
- Do they know that living things that can be classified, grouped, identified and named using a simple key? (Working Scientifically)
- Do they know what changes to the environment could cause living things to become endangered?



Key Skills and Understanding			
	Planning	Obtaining and presenting evidence	Considering evidence and evaluating
Expected	<ul style="list-style-type: none"> • Can they set up a simple fair test to make comparisons? • Can they plan a fair test and isolate variables, explaining why it was fair and which variables have been isolated? • Can they suggest improvements and predictions? • Can they decide which information needs to be collected and decide which is the best way for collecting it? • Can they use their findings to draw a simple conclusion? 	<ul style="list-style-type: none"> • Can they take measurements using different equipment and units of measure and record what they have found in a range of ways? • Can they make accurate measurements using standard units? • Can they explain their findings in different ways (display, presentation, writing)? 	<ul style="list-style-type: none"> • Can they find any patterns in their evidence or measurements? • Can they make a prediction based on something they have found out? • Can they evaluate what they have found using scientific language, drawings, labelled diagrams, bar charts and tables? • Can they use straightforward scientific evidence to answer questions or to support their findings? • Can they identify differences, similarities or changes related to simple scientific ideas or processes?
Exceeding	<ul style="list-style-type: none"> • Can they plan and carry out an investigation by controlling variables fairly and accurately? • Can they use test results to make further predictions and set up further comparative tests? 	<ul style="list-style-type: none"> • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? 	<ul style="list-style-type: none"> • Can they report findings from investigations through written explanations and conclusions? • Can they use a graph or diagram to answer scientific questions?





Key Knowledge, Skills and Understanding for Science

Year 5

Key Knowledge

Earth and Space - We will ever send another human to the moon?

- Do they know there are 8 planets in our Solar System? Mercury, Mars, Earth, Venus, Saturn, Jupiter, Uranus, Neptune?
- Do they know the Earth takes about 24 hours to rotate on its axis and 365 days to orbit the Sun?
- Do they know that Neil Armstrong was the first man on the moon?
- Do they know that they can compare the time of day in different countries by identifying different time zones? (Working Scientifically)

Animals Including Humans - How different will you be when you are as old as your grandparents?

- Do they know the names of the four stages of development are infancy, childhood, adolescence and adulthood?
- Do they know that the life expectancy of a human is around 80 years old?
- Do they know that regular exercise and healthy eating increases your chances of living a longer and healthier life?
- Do they know human gestation is 9 months compared to an elephant which is 22 months? (Working Scientifically)

Properties of Materials - Could you be the next CSI investigator?

- Do they know irreversible changes, like burning cannot be undone but reversible changes like melting can?
- Do they know that we can separate mixtures using sieving and filtering but when a substance dissolves, like salt in water, we use evaporation?
- Do they know that mixtures such as vinegar and bicarbonate of soda can cause an irreversible change, where carbon dioxide is produced?
- Do they know that plastic and wool are thermal insulators, which prevent heat from passing through them? (Working Scientifically)

Life cycles - Do all animals and plants start life as an egg?

- Do they know the four stages of the butterfly life cycle: the egg, the larva (caterpillar), pupa (chrysalis) and the adult stage (butterfly)?
- Do they know seeds are produced in the ovary of flowering plants by pollen that insects carry from one plant to another?
- Do they know that David Attenborough is a famous naturalist who studies how plants and animals behave?
- Do they know that when we observe chicks over a period of time their features change such as feather colour and size of beak? (Working Scientifically)

Forces - Can you feel the force?

- Do they know that gravity, discovered by Isaac Newton, is the pulling force acting between the Earth and a falling object?
- Do they know friction works in the opposite direction to a moving object, slowing it down? For example, applying the brakes on a bike?
- Do they know that water resistance is a type of friction between the water and a moving object?
- Do they know the larger the surface area of a parachute, the greater the air resistance and therefore the slower it travels? (Working Scientifically)



Key Skills and Understanding Year 5

	Planning	Obtaining and presenting evidence	Considering evidence and evaluating
Expected	<ul style="list-style-type: none"> • Can they plan and carry out a scientific enquiry to answer questions, including recognising and controlling variables where necessary? • Can they make a prediction with reasons? • Can they use test results to make predictions to set up comparative and fair tests? • Can they present a report of their findings through writing, display and presentation? 	<ul style="list-style-type: none"> • Can they take measurements using a range of scientific equipment with increasing accuracy and precision? • Can they take repeat readings when appropriate? • Can they record more complex data and results using scientific diagrams, labels, classification keys, tables, scatter graphs, bar and line graphs? 	<ul style="list-style-type: none"> • Can they report and present findings from enquiries through written explanations and conclusions? • Can they use a graph to answer scientific questions?
Exceeding	<ul style="list-style-type: none"> • Can they explore different ways to test an idea, choose the best way and give reasons? • Can they vary one factor whilst keeping the others the same in an experiment? • Can they use information to help make a prediction? • Can they explain, in simple terms, a scientific idea and what evidence supports it? 	<ul style="list-style-type: none"> • Can they decide which units of measurement they need to use? • Can they explain why a measurement needs to be repeated? 	<ul style="list-style-type: none"> • Can they find a pattern from their data and explain what it shows? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this?



Living things and their habitats - Could Spiderman really exist?

- Do they know that living things are classified to avoid confusion and show how they are related to each other?
- Do they know that animals are classified by similarities and differences (vertebrates-animals that have a backbone, invertebrates-animals that do not)? (working scientifically)
- Do they know the name of some microorganisms including some which are harmful/ helpful?

Animals including humans - What would a journey through your body look like?

- Do they know that the main function of the respiratory system is to supply oxygen to all parts of the body (oxygen enters and carbon dioxide is expelled)?
- Do they know that the heart contains four chambers (Left Atrium, Right Atrium, Left Ventricle, Right Ventricle)?
- Do they know that the left side of the heart contains oxygenated blood and the right side of the heart contains de-oxygenated blood?
- Do they know that their heart rate is the number of beats their heart makes per minute (bpm)? (working scientifically)

Light - How can you light up your life?

- Do they know that light travels in a straight line? (working scientifically)
- Do they know the functions of the parts of the eye (e.g. the pupil expands in dim light to allow more light in, and contracts in bright light to protect the retina)?
- Do they know that objects are seen when light hits an object, then reflects into the eye?
- Do they know that light sources can be natural (the sun) or man-made (a torch)?

Evolution and Inheritance - Have we always looked like this?

- Do they know that fossils can show what plants and animals looked like many years ago?
- Do they know that evolution is a Scientific theory to explain how living things changed over a long time?
- Do they know that Charles Darwin was an English scientist who studied nature and was famous for his theory of evolution?
- Do they know that genes that are passed onto you determine many of your traits, such as hair colour and skin colour?

Electricity - Could you be the next Nintendo apprentice?

- Do they know that there are different symbols for circuit components?
- Do they know that the brightness of a bulb is linked to the amount of voltage in a circuit? (Working Scientifically)
- Do they know that a conductor is a material that lets electricity pass through it easily?



Key Skills and Understanding

	Planning	Obtaining and presenting evidence	Considering evidence and evaluating
Expected	<ul style="list-style-type: none"> • Can they explore different ways to test an idea, choose the best way, and give reasons? • Can they vary one factor whilst keeping the others the same in an experiment? Can they explain why they do this? • Can they plan and carry out an investigation by controlling variables fairly and accurately? • Can they make a prediction with reasons? • Can they use information to help make a prediction? • Can they use test results to make further predictions and set up further comparative tests? • Can they explain, in simple terms, a scientific idea and what evidence supports it? • Can they present a report of their findings through writing, display and presentation? 	<ul style="list-style-type: none"> • Can they explain why they have chosen specific equipment? (incl ICT based equipment) • Can they decide which units of measurement they need to use? • Can they explain why a measurement needs to be repeated? • Can they record their measurements in different ways? (incl. bar charts, tables and line graphs) • Can they take measurements using a range of scientific equipment with increasing accuracy and precision? 	<ul style="list-style-type: none"> • Can they find a pattern from their data and explain what it shows? • Can they use a graph to answer scientific questions? • Can they link what they have found out to other science? • Can they suggest how to improve their work and say why they think this? • Can they record more complex data and results using scientific diagrams, classification keys, tables, bar charts, line graphs and models? • Can they report findings from investigations through written explanations and conclusions? • Can they identify scientific evidence that has been used to support to refute ideas or arguments? • Can they report and present 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?
Exceeding	<ul style="list-style-type: none"> • Can they choose the best way to answer a question? • Can they use information from different sources to answer a question and plan an investigation? • Can they make a prediction which links with other scientific knowledge? • Can they identify the key factors when planning a fair test? • Can they explain how a scientist has used their scientific understanding plus good ideas to have a breakthrough? 	<ul style="list-style-type: none"> • Can they plan in advance which equipment they will need and use it well? • Can they make precise measurements? • Can they collect information in different ways? • Can they record their measurements and observations systematically? • Can they explain qualitative and quantitative data? 	<ul style="list-style-type: none"> • Can they draw conclusions from their work? • Can they link their conclusions to other scientific knowledge? • Can they explain how they could improve their way of working?





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