Science: Progression and End Points at Foundry Lane Primary School

The National Curriculum for Primary subject covers the following areas:

Plants (biology) By the end of the year learners will know						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Growing – new life Plants - How plants grow	Plants -Identify and describe the basic structure of a variety of common flowering plants, including trees.	Plants -Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Plants -Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers -Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal (*Longitudinal study.)*	Plants Longitudinal study- How does the wildlife in a habitat change over time?		Plants Longitudinal study
Animals including humans (biology) By the end of the year learners will know						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Animals including humans -Looking after ourselves - germs and bacteria, balanced diet, oral health, teddy bear hospital visit, life cycles of butterflies and frogs. -Characteristics of farm animals (hens)	Animals including humans -Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals -Identify, name, draw and label the basic parts of the human	Animals including humans -Notice that animals, including humans, have offspring which grow into adults -Find out about and describe the basic needs of animals,	Animals including humans -Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat	Animals including humans -Construct and interpret a variety of food chains, identifying producers, predators and prey.	Animals including humans -Describe the changes as humans develop to old age.	Animals including humans -Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function **Evolution and inheritance (biology)**

	body and say which part of the body is associated with each sense	including humans, for survival (water, food and air)				-Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago -Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
Living things and their habitats (biology) By the end of the year learners will know						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Living things and habitats -Explore and compare the differences between things that are living, dead, and things that have never been alive -Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food		**Living things and habitats** -Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	**Living things and habitats** -Describe the life process of reproduction in some plants and animals.	**Living things and habitats** -Give reasons for classifying plants and animals based on specific characteristics

Materials (chemistry) By the end of the year learners will know						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Materials (Chemistry) Exploring materials. **Materials** Changing states ice / water	<u>Materials</u> -Distinguish between an object and the material from which it is made -Identify and name a variety of everyday materials,	<u>Materials</u> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	<u>Rocks</u> compare and group together different kinds of rocks on the basis of their appearance and simple physical properties -Describe in simple terms how fossils are formed when things that have lived are trapped within rocks	<u>States of matter</u> -Compare and group materials together, according to whether they are solids, liquids or gases -Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)	<u>Properties and changes to materials</u> -Compare hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets -Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution -Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	
Light (physics) By the end of the year learners will know						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			<u>Light</u> -recognise that they need light in order to see things and that dark is the absence of light - recognise that light from the sun can be dangerous and that there are ways to protect their eyes	<u>Electricity</u> -Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers -Recognise some common conductors and insulators, and associate metals with being good conductors.		<u>Light</u> -Recognise that light appears to travel in straight lines <u>Electricity</u> - use recognised symbols when representing a simple circuit in a diagram.

Forces (physics)

By the end of the year learners will know

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Forces (physics) Exploring how things work through their play with toys e.g. water play, magnets, stretching elastic bands etc		Longitudinal study	Forces and magnets -Notice that some forces need contact between two objects, but magnetic forces can act at a distance -Predict whether two magnets will attract or repel each other, depending on which poles are facing.		Forces -Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object Earth and space -Describe the movement of the Earth, and other planets, relative to the Sun in the solar system	

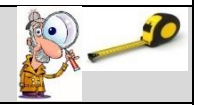
Changes/Environment (physics)

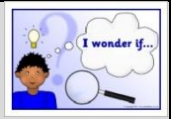
By the end of the year learners will know

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasons (Physics) Autumn Walk - Describe what they see, hear and feel whilst outside. **Seasons** Winter Walk - Explore the natural world around them. Use senses to compare similarities and differences. **Seasons** Spring Longitudinal study walks in different seasons comparing changes **Seasons** Summer Walk - Explore the natural world around them. Understand the effect of changing seasons on the natural world around them.	Seasonal changes - Observe changes across the four seasons - Observe and describe weather associated with the seasons and how day length varies. (Longitudinal study)					

Sound (physics) By the end of the year learners will know By the end of the year learners can (edit)						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
				Sound -Identify how sounds are made, associating some of them with something vibrating		

Asking and answering questions By the end of the year learners can						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	with support ask simple questions and recognise that they can be answered in different ways While exploring the world, develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, answer these questions. • Answer questions developed with the teacher often through a scenario. • Be involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in.	**ask simple questions and recognise that they can be answered in different ways** While exploring the world, develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, answer these questions. • Answer questions developed with the teacher often through a scenario. • Be involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in.	**with support ask relevant questions and using different types of scientific enquiries to answer them** • consider their prior knowledge when asking questions. Independently use a range of question stems. e.g why is ...? What would happen if ...? Does ...? Can ...? Where appropriate, they answer these questions. • Answer questions posed by the teacher. • Given a range of resources, decide for themselves how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of enquiry that	**ask relevant questions and using different types of scientific enquiries to answer them** • consider their prior knowledge when asking questions. Independently use a range of question stems. e.g why is ...? What would happen if ...? Does ...? Can ...? Where appropriate, they answer these questions. • Answer questions posed by the teacher. • Given a range of resources, decide for themselves how to gather evidence to answer the question. Recognise when secondary sources can be used to answer questions that cannot be answered through practical work. Identify the type of enquiry that	**With support plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** • Independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. . • Given a wide range of resources, decide for themselves how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify their choice. Recognise how secondary sources can be used to answer questions that cannot be	**Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.** • Independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. . • Given a wide range of resources, decide for themselves how to gather evidence to answer a scientific question. Choose a type of enquiry to carry out and justify their choice. Recognise how secondary sources can be used to answer questions that cannot be answered through practical work.

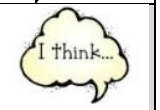
			they have chosen to answer their question.	they have chosen to answer their question.	answered through practical work.	
Observation and measurement By the end of the year learners can 						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	with support observe closely, using simple equipment • Explore the world around them. Make careful observations to support identification, comparison and noticing change. Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • Begin to take measurements, initially by comparisons.	**observe closely, using simple equipment** • Explore the world around them. Make careful observations to support identification, comparison and noticing change. Use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • Begin to take measurements, initially by comparisons, then using non-standard units.	**with support make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** • Make systematic and careful observations. • Use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	**make systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers** • Make systematic and careful observations. • Use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements.	**with support, take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** • select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); ad just the observation period and	**take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate** • select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); ad just the observation period and

					frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value.)	frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value.)
By the end of the year learners can **Performing and planning testing (5 types of enquiry)** 						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	with support perform simple tests • Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.	**perform simple tests** • Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.	**with support set up simple practical enquiries, comparative and fair tests** • Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking.	**set up simple practical enquiries, comparative and fair tests** • Select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. Plan does not mean they need to write out a plan.	**with support plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** • select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make	**plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** • select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how

			Plan does not mean they need to write out a plan. They just need the question and to be able to verbalise what they are going to do. If it is a fair test, they need the grid completed to guide how they will test to keep variables accurate. *Explanatory note- teacher knowledge not children* *A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.*	They just need the question and to be able to verbalise what they are going to do. If it is a fair test, they need the grid completed to guide how they will test to keep variables accurate. *Explanatory note- teacher knowledge not children* *A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.*	over time and for how long. They look for patterns and relationships using a suitable sample.	long. They look for patterns and relationships using a suitable sample.
Identifying similarities, changes and classifying By the end of the year learners can						

Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	With support, identify and classify • Classify using simple prepared tables and sorting rings. • Use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	**Identify and classify** • Classify using simple prepared tables and sorting rings. • Use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	**With support, gather, record, classify and present data in a variety of ways to help in answering questions** • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.	**Gather, record, classify and present data in a variety of ways to help in answering questions** • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. • Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships.	**With support, record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** • The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. • They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn	**Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** • The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. • They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn

					diagrams, Carroll diagrams and classification keys.	diagrams, Carroll diagrams and classification keys.
Gather and record data By the end of the year learners can 						
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	With support, gather and record data to help in answering questions. record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.	**Gather and record data to help in answering questions.** • record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.	**With support, record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** • The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. • They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). • Children are supported to present the	**Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables** • The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. • They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). • Children are supported to present the same data in different	**With support, record data and results of increasing complexity using scientific language, labels, classification keys, tables, scatter graphs, bar and line graphs** • decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. • record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using	**Record data and results of increasing complexity using scientific language, labels, classification keys, tables, scatter graphs, bar and line graphs** • decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. • record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using

			same data in different ways in order to help with answering the question.	ways in order to help with answering the question.	tables, Venn diagrams, Carroll diagrams and classification keys. • present the same data in different ways in order to help with answering the question.	tables, Venn diagrams, Carroll diagrams and classification keys. • present the same data in different ways in order to help with answering the question.
By the end of the year learners can			**Using results to generate conclusions/answer questions**			
Year R	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	With support, use their observations and ideas to suggest answers to questions • use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. • The children recognise 'biggest and	**Use their observations and ideas to suggest answers to questions** • use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. • The children recognise 'biggest and	**With support, use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** • answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	**Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** • answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence. • They draw conclusions based on	**With support, 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** • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall	**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** • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall

	smallest', 'best and worst' etc. from their data.	smallest', 'best and worst' etc. from their data.	• They draw conclusions based on their evidence and current subject knowledge. (PEAK) • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. • Children use their evidence to suggest (predict) values for different items tested using the same method	their evidence and current subject knowledge. (PEAK) • In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. • Children use their evidence to suggest (predict) values for different items tested using the same method e.g. the distance travelled	pattern; and explain their findings using their subject knowledge. They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data. • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests. EVIDENCE **With support, identifying scientific evidence that**	pattern; and explain their findings using their subject knowledge. They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data. • Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests. EVIDENCE **Identifying scientific evidence that has been**

			e.g. the distance travelled by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry. • They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.	**has been used to support or refute ideas or arguments** • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered.	**used to support or refute ideas or arguments** • Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered.

					• They talk about how new discoveries change scientific understanding.	• They talk about how new discoveries change scientific understanding.