Knowledge and Skills Progression Document

Science				
	Scientific Skills	**Biology**	**Chemistry**	**Physics**
N U R S E R Y	**<u>Five types of experimental skills</u>** ***(****Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can talk about what I see, using a wide vocabulary. 2. I can explore how things work. 3. I can work in a group with an adult to classify simple groupings. 4. I can join an adult in performing simple tests. 5. I can guess what I think might happen. **<u>Questions</u>** 6. I can understand and ask 'why' questions, like "Why do you think the caterpillar got so far?" **<u>Recording Data</u>** 7. I can start to make observations and record them using pictures. 8. I can start to recognise similarities & differences in relation to people. 9. I can talk to an adult about what has been found/found out.	**<u>Natural World</u>** 10. Begin to understand the need to respect and care for the natural environment and all living things 11. Plant seeds and care for growing plants 12. Understand the key features of the life cycle of a plant and an animal 13. Make healthy choices about food and drink, activity and tooth brushing.	**<u>Materials</u>** 14. Use all their sense in hands-on exploration of natural materials. 15. Explore collections of materials with similar and/or different properties. 16. Talk about the differences between materials and changes they notice.	**<u>Forces</u>** 17. Explore and talk about different forces they can feel.

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RECEPTION	**Five types of experimental skills** ***(****Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 18. With support, I can observe changes over time. 19. I can start to observe changes and patterns and describe what I see, hear and feel when outside. 20. I can identify and classify simple groupings. 21. With support, I can perform simple tests. 22. I can make predictions with support or prompting. **Questions** 23. I can ask questions to find out more and to check what has been said to me. 24. I can ask questions about why things happen and how things work. **Using scientific equipment** 25. With support, I can use simple equipment and observe closely. 26. I can take measurements, use senses and simple equipment to explore the world around me. **Recording Data** 27. I can make observations and record them using pictures. 28. I can recognise similarities, differences, patterns and changes in relation to people. 29. I can talk to an adult about what has been found/found out and describe events in some detail. 30. I can draw conclusions and work out problems with support, talking about how things work and why they might happen.	**0.1 Plants** 14. Recognise & draw plants and describe some of their common features. 15. Describe some of the conditions needed for plants to grow. 16. Recognise that trees are types of plant. **0.2 Animals, including Humans** 17. Identify some parts of the body. 18. Write the name of some parts of the body. 19. Name & draw some animals and identify them as living things. 20. Recognise some foods as either meat, fruit, vegetables or dairy. 21 Know and talk about different factors we need to stay healthy (Physical activity, healthy eating etc.) **0.3 Living Things and their Habitats** 22. Understand the environment in which living things exist is called a habitat. 23. Identify different types of habitats and recognise how these are different to the ones in which they live. 24. Associate some living things with a particular habitat and identify some similarities and differences between habitats. 25. Recognise living things need food and water to stay healthy.	**0.4 Materials** 26. Identify some materials from which objects are made. 27. Describe some characteristics of materials. 28. Describe some of the properties of different materials, including metals and elastic materials.	**0.5 Seasonal Changes** 29. Name the seasons and put them in the correct order from any starting point. 30. Describe some of the features of the seasons and how they affect the natural world around them.

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Year 1	**<u>Five types of experimental skills</u>** ***(****Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can observe changes over time. 2. I can observe changes and patterns. 3. I can identify and classify. 4. I can perform simple tests. 5. I can perform a fair test with adult support. **<u>Questions</u>** 6. I can ask simple questions and recognise that they can be answered in different ways. 7. I can use my observations and ideas to suggest answers to questions. 8. I can communicate my ideas, what I can do and what I can find out in different ways. **<u>Using scientific equipment</u>** 9. I can use simple equipment to observe closely. 10. I can use hand lenses and egg timers. **<u>Recording Data</u>** 11. I can gather and record data to help in answering questions. 12. I can use simple scientific language with help.	**<u>1.1 Plants</u>** 13. Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. 14. Identify and describe the basic structure of a variety of common flowering plants, including trees. **<u>1.2 Animals, including Humans</u>** 15. Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. 16. identify and name a variety of common animals that are carnivores, herbivores and omnivores. 17. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets). 18. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**<u>1.3 Everyday Materials</u>** 19. Distinguish between an object and the material from which it is made. 20. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. 21. Describe the simple physical properties of a variety of everyday materials. 22. Compare and group together a variety of everyday materials on the basis of their simple physical properties.	**<u>1.4 Seasons</u>** 23. Observe changes across the four seasons. 24. Observe and describe weather associated with the seasons and how day length varies.

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Year 2	**Five types of experimental skills** *(Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can use simple equipment to observe closely including changes over time. 2. I can use observations and ideas to suggest answers to questions noticing similarities, differences and patterns. 3. I can identify, group and classify. 4. I can perform simple comparative tests. 5. I can gather and record data to help in answering questions including from secondary sources of information. **Questions** 6. I can ask simple questions and recognise that they can be answered in different ways including use of scientific language from the national curriculum. 7. I can communicate my ideas, what I can do and what I can find out in different ways. **Using scientific equipment** 8. I can ask my own questions about what I notice. 9. I can use hand lenses and egg timers. **Recording Data** 10. I can gather and record data to help in answering questions including from secondary sources of information.	**2.1 Living Things and their Habitats** 11. Explore and compare the differences between things that are living, dead, and things that have never been alive. 12. Identify how most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of animals and plans, and how they depend on each other. 13. Identify and name a variety of plants and animals in their habitats, including micro-habitats. 14. 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. **2.2 Plants** 15. Observe how seeds and bulbs grow into mature plants. 16. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. 17. Identify and describe how plants need water, light and a suitable temperature to grow and stay healthy. **2.3 Animals, including Humans** 18. Understand that animals, including humans, have offspring that grow into adults. 19. Describe the basic needs of animals, including humans, for survival. 20. Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	**2.4 Uses of Everyday Materials** 21. Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. 22. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	

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Year 3	**Five types of experimental skills** *(Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can make systematic and careful observations over time. 2. I can ask questions surrounding patterns I have found in data. 3. I can gather, record, classify and present data in a variety of ways. 4. I can set up simple practical enquiries, comparative and fair tests. 5. I can use secondary sources with adult support to help clarify results seen. **Questions** 6. I can ask relevant questions to answer my questions in different ways using scientific language from the national curriculum. **Using scientific equipment** 7. I can set up simple practical enquiries, comparative and fair tests. 8. I can take measurements using standard units, using a range of equipment. 9. I can set up simple practical enquiries, comparative and fair tests. **Recording Data** 10. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. **Reporting on findings** 11. I can report on findings from enquiries, using presentations of results and conclusions 12. I can use results to draw simple conclusions. **Using scientific evidence** 13. I can identify differences, similarities or changes related to simple scientific ideas and processes. 14. I can use straightforward scientific evidence to answer questions or to support my findings.	**3.1 Plants** 15. 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. 16. Investigate the way in which water is transported within plants. 17. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. **3.2 Animals, including Humans** 18. 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. 19. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**3.3 Rocks and Minerals** 20. Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. 21. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. 22. Recognise that soils are made from rocks and organic matter.	**3.4 Light** 23. Recognise that they need light in order to see things and that dark is the absence of light. 24. Understands that light is reflected from surfaces. 25. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. 26. Recognise that shadows are formed when the light from a light source is blocked by a solid object. 27. Find patterns in the way that the size of shadows change. **3.5 Forces & Magnets** 28. Compare how objects move on different surfaces. 29. Understands that some forces need contact between two objects, but magnetic forces can act at a distance. 30. Observe how magnets attract or repel each other and attract some materials and not others. 31. compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. 32. Describe magnets as having two poles. 33. Predict whether two magnets will attract or repel each other, depending on which poles are facing.

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Year 4	**Five types of experimental skills** ***(****Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can make systematic and careful observations over time, looking at similarities and differences. 2. I can ask questions surrounding patterns I have found in data. 3. I can gather, record, classify and present data in a variety of ways to help in answering questions. 4. I can set up simple practical enquiries, comparative and fair tests. 5. I can use secondary sources with adult support to help clarify results seen. **Questions** 6. I can ask relevant questions and use different types of scientific enquiries to answer them using scientific language from the national curriculum. 7. I can develop a deeper understanding through talk, asking questions about scientific phenomena, analysing functions and interactions more systematically. **Using scientific equipment** 8. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision. **Recording Data** 9. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. **Reporting on findings** 10. I can report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. 11. I can use results to draw simple conclusions, make predictions for new values and suggest improvements. 12. I can classify, group and present data in a series of ways to help in answering questions.	**4.1 Living Things and their Habitats** 15. Recognise that living things can be grouped in a variety of ways. 16. Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. 17. Recognise that environments can change and that this can sometimes pose dangers to living things. **4.2 Animals, including Humans** 18. Describe the simple functions of the basic parts of the digestive system in humans. 19. Identify the different types of teeth in humans and their simple functions. 20. Construct and interpret a variety of food chains, identifying producers, predators, prey and consumers.	**4.3 States of Matter** 21. Compare and group materials together, according to whether they are solids, liquids or gases. 22. 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). 23. Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	**4.4 Sound** 24. Identify how sounds are made, associating some of them with something vibrating. 25. Recognise that vibrations from sounds travel through a medium to the ear. 26. Find patterns between the pitch of a sound and features of the object that produced it. 27. Find patterns between the volume of a sound and the strength of the vibrations that produced it. 28. Recognise that sounds get fainter as the distance from the sound source increases. **4.5 Electricity** 29. Identify common appliances that run on electricity. 30. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. 31. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery, including with switches. 32. Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

	Using scientific evidence 13. I can identify differences, similarities or changes related to simple scientific ideas and processes. 14. I can use straightforward scientific evidence to answer questions or to support my findings.			33. Recognise some common conductors and insulators, and associate metals with being good conductors.

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Year 5	**Five types of experimental skills** *(Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can observe over time, asking pertinent questions about similarities and differences. 2. I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. 3. I can classify, group and present data in a series of ways to help in answering questions. 4. I can take measurements, using a range of scientific equipment, with increasing accuracy and precision. 5. I can use secondary sources to help interpret results seen. **Questions** 6. I can plan different types of scientific enquiries to answer questions, including recognising variables where necessary. **Using scientific equipment** 7. I can make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. **Recording Data** 8. I can record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 9. I can use test results to set up further comparative and fair tests. **Reporting on findings** 10. I can report and present findings from enquiries in oral and written forms such as displays and other presentations. 11. I can use results to draw more complex conclusions, make predictions for new values and suggest improvements. **Using scientific evidence** 12. I can identify scientific evidence that has been used to support or refute ideas or arguments.	**5.1 Living Things and their Habitats/Animals, including Humans** 13. Describe the changes as humans develop to old age. 14. Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. 15. Describe the life process of reproduction in some plants and animals.	**5.2 Properties and Changes in Materials** 16. Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. 17. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. 18. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. 19. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. 20. Demonstrate that dissolving, mixing and changes of state are reversible changes. 21. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	**5.3 Earth & Space** 22. Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. 23. Describe the movement of the Moon relative to the Earth. 24. Describe the Sun, Earth and Moon as approximately spherical bodies. 25. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. **5.4 Forces** 26. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. 27. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. 28. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

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Year 6	**Five types of experimental skills** *(Observe over time/ Pattern seeking/ Identifying, classifying and grouping/ Comparative and Fair test/ Research using secondary sources)* 1. I can recognise things change over time, and can ask pertinent questions and suggest reasons for similarities and differences over time. 2. I can ask questions surrounding patterns I have found in data as to why something I have observed has happened. 3. I can develop and use keys and other information to classify and describe objects in ways to help answer questions. 4. I can take measurements, using a range of scientific equipment, including thermometers and data loggers with increasing accuracy and precision, taking repeat readings when appropriate. 5. I can use secondary sources to help interpret results seen. **Questions** 6. I can plan different types of scientific enquiries to answer my own or others' questions, including recognising and controlling variables where necessary. **Using scientific equipment** 7. I can make my own decisions and select the most appropriate type of scientific enquiry to use and recognise how to set up a comparative and fair test. **Recording Data** 8. I can record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. 9. I can use test results to make predictions to set up further comparative and fair tests. **Reporting on findings** 10. I can 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.	**6.1 Living Things and their Habitats** 13. Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. 14. Give reasons for classifying plans and animals based on specific characteristics. **6.2 Animals, including Humans** 15. Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. 16. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. 17. Describe the ways in which nutrients and water are transported within animals, including humans. **6.3 Evolution and Inheritance** 18. Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. 19. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. 20. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.		**6.4 Light** 21. Recognise that light appears to travel in straight lines. 22. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. 23. Explain that we see things because light travels from the light sources to our eyes or from light sources to objects then to our eyes. 24. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. **6.5 Electricity** 25. Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. 26. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. 27. Use recognised symbols when representing a simple circuit in a diagram.

	11. I can use results to draw more complex conclusions, make predictions for new values and suggest improvements and raise further questions. **<u>Using scientific evidence</u>** 12. I can justify and evaluate my own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.			