KEY KNOWLEDGE PROGRESSION DOCUMENT – Science (Chemistry)

Strand	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7

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Materials and their properties	• SCN.1 know the names of some simple materials **(S)** • SCN.2 know how to explore collections of materials, with similar and/or different properties (**D**)	• SCR.1 know the differences between simple materials and the changes they notice (e.g. adding water to sand) **(S)** • SCR.2 know the name of the everyday materials; wood, metal, glass, plastic **(S)**	• SC1.1 know the difference between an object and the material from which it is made **(S)** • SC1.2 know and name a variety of everyday materials, including wood, plastic, glass, metal, water, rock and more **(S)** • SC1.3 know the simple properties (e.g. hard, soft, stretchy, stiff, waterproof, not waterproof, opaque, transparent) of a variety of everyday materials **(S)** • SC1.4 know a variety of everyday materials **(S)** and compare and group them together on the basis of their simple physical properties **(D)**	• SC2.1 know how materials can be changed by squashing, bending, twisting and stretching **(S)** • SC2.2 know and compare the suitability of a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses **(D)**	• SC3.1 know how to compare and group rocks based on their appearance and physical properties **(D)** • SC3.2 know that there are three types of rock: igneous, sedimentary and metamorphic, and know how each is formed **(S)** • SC3.3 know in simple terms how fossils are formed when things that have lived are trapped within rocks **(S)** • SC3.4 know that soils are made from rocks and organic matter **(S)**		• SC5.1 know how to compare and group together everyday materials on the basis of their properties (e.g. hardness, solubility, transparency, conductivity, [electrical & thermal], and response to magnets) **(D)** • SC5.2 know that some materials will dissolve in liquid to form a solution **(S),** and describe how to recover a substance from a solution **(P)** • SC5.3 know how mixtures might be separated using knowledge of solids, liquids and gas, including through filtering, sieving and evaporating **(P)** • SC5.4 know the particular uses of everyday materials including metal, wood and plastic, based on evidence from comparative and fair tests **(S)** • SC5.5 know that dissolving, mixing and changes of state are reversible changes through investigation **(P)** • SC5.6 know 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 soda **(S)**		• SC7.1 know how the properties of the different components of a mixture lead to different methods of separating them **(S)** • SC7.2 know the difference between a chemical and physical change **(S)** • SC7.3 link knowledge of chemical and physical changes to reactions with acids and alkalis **(D)**

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States of Matter		SCR.3 know some materials can change, (e.g. ice in the water tray, baking; combing ingredients; turning bread into toast) (**S**)				• SC4.1 know how to compare and group materials together according to whether they are solids, liquids or gases **(D)** • SC4.2 know that some materials change state when they are heated or cooled **(S),** and measure or research the temperature at which this happens (°C) (**P**) • SC4.3 know the part played by evaporation and condensation in the water cycle (**S**) and associate the rate of evaporation with temperature **(D)**			• SC7.4 know how the properties of solids, liquids and gases are determined by the particle model **(S)**

Curriculum End Points

The KKPDs are the input to the curriculum. The curriculum end points are the output. Curriculum end points capture the knowledge, skills and understanding that children should have at the end of each year. They build progressively over time so that children leave Year 6 well-prepared for the next stage of education as competent and capable scientist.

For subject leaders, they provide a clear overview of the end of year expectations for each year group, which will support the planning and assessment of the curriculum.

For teachers, they provide further clarity around what children should be able to do at the end of each year, using the knowledge they have gained from being taught the KKPDs. They support teachers to plan activities that help to develop children as effective scientists. They should be used to check what children know and how well they can apply this knowledge across the curriculum.

For children, they ensure that they receive an equitable curriculum which gives them the substantive, procedural and disciplinary knowledge needed to be successful in their future studies.

End points are taken from the National Curriculum Teacher Assessment Framework for Key Stage 1 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1125249/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_1.pdf) and Key Stage 2 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1119094/2018-19_teacher_assessment_frameworks_at_the_end_of_key_stage_2.pdf).

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Curriculum end points	Children should be able to... Recall the knowledge specified within the KKPDs for Nursery Talk about the differences in materials and how they can be changed Name some different materials e.g sand, water, wood Explore the natural world, commenting on what they can see, hear, feel etc.	Children should be able to... Recall the knowledge specified within the KKPDs for Reception Identify different materials, exploring and describing changes to the state Name some everyday materials e.g wood, metal, glass, plastic	Children should be able to... Recall the knowledge specified within the KKPDs for Year 1 Distinguish objects from materials Describe the properties of everyday materials examining similarities and differences Identify and group everyday materials based on properties	Children should be able to... Recall the knowledge specified within the KKPDs for Year 2 Compare the suitability of materials for different purposes Explain how materials can be changed by squashing, bending, twisting and stretching	Children should be able to... Recall the knowledge specified within the KKPDs for Year 3 Recount how fossils are formed Group rocks according to their properties, based on first-hand observations Explain what constitutes soil	Children should be able to... Recall the knowledge specified within the KKPDs for Year 4 Compare and contrast the characteristics of different states of matter and group materials on this basis Describe how materials change state at different temperatures and use this to explain everyday phenomena, including the water cycle	Children should be able to... Recall the knowledge specified within the KKPDs for Year 5 Group and identify materials in different ways according to their properties, based on first-hand observation Justify the use of different everyday materials for different uses, based on their properties Justify whether changes in materials are reversible or not Discuss what happens when dissolving occurs in everyday situations Demonstrate how to separate mixtures and solutions into their components	No chemistry National Curriculum objectives in Year 6.	Children should be able to... Recall the knowledge specified within the KKPDs for Year 7 Use the particle model to explain the properties of different states of matter Associate chemical and physical changes to reactions with acids and alkalis Know which methods of separating to use according to the properties of the different components of a mixture