**Year 5 Science Curriculum –Autumn 2**

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| **Theme: Properties and uses of materials** |
| **Curriculum objectives** | **Vocabulary** | **Links across the curriculum** |
| To compare and group together everyday materials on the basis of their properties.To compare and group together everyday materials o response to magnets give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.To compare and group together everyday materials on the basis of their properties.- To give reasons, based on evidence from comparative and fair tests.To 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]To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. | **Construction** | The process of building. | **Leak** | To allow liquid to escape. | * DT: selection of materials for construction
* Art: Materials and properties
* Maths: Grouping data and comparison
* English: Oracy
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| **Design** | To make or draw plans for something new. | **Structure** | The ways the parts of something are joined together. |
| **Disassemble** | To take apart. | **Dispose**  | To throw away something. |
| **Invent/****invention** | To create or design something new. | **Flow** | Continuous movement. |
| **Pour** | To flow in a steady stream. |  |  |
| **Tier 3 vocabulary** [SNAP23\_Y5\_M2\_materials\_ms.docx (live.com)](https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fstatic.collins.rhapsode.com%2FSnap_Science%2FTeaching_Science%2FYear_5%2FSNAP23_Y5_M2_materials_ms.docx&wdOrigin=BROWSELINK) |
| **Prior knowledge:** *What specifically have pupils learned that is relevant to this unit that they are building upon?* | **Future knowledge:** *What specifically will pupils learn in the future that is relevant to this unit?* |
| * the properties of solids, liquids and gases, including how heating and cooling can cause a change of state; evaporation and condensation and the part played in the water cycle; how a thermometer works and how it can be used to measure temperature (Year 4 Chemistry – States of matter)
* materials are electrical conductors and electrical insulators (Year 4 Physics –Electricity) magnets (Year 3 Physics – Forces and magnets) human impact on the environment and what happens to different materials when they are thrown away (Year 4 Biology – Human impact on the environment)

- Stages of human growth (Year 4 Biology – Human growth) | This prepares children for later learning:* About dissolving, solutions, separating mixtures, filtering, sieving and evaporating, reversible and irreversible changes (Year 5 Chemistry – Separating mixtures and changing materials).
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| **Lesson Sequence** | **Key Knowledge** | **Key Skills** |
| 1. How can we compare and group materials?
 | * Materials have properties that make them fit for certain purposes.
* These may include being: absorbent, brittle, durable, ductile, elastic, electrical conductor, electrical insulator, flexible, hard, malleable, transparent, translucent, opaque, permeable/impermeable, rigid, thermal conductor, thermal insulator, magnetic.
 | Working scientifically:* taking measurements, using a range of scientific equipment, [with increasing accuracy and precision, taking repeat readings when appropriate]
* recording data and results of increasing complexity using [scientific diagrams and labels, classification keys,] tables, [scatter graphs, bar and line graphs]
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| 1. Which materials did the builders use when constructing our school and why?
 | - Materials are used in many different ways and for particular purposes based on their properties. - Materials can be fit-for-purpose. - How materials may vary in form (e.g. plastics of different types) and why they are used for particular purposes. - Weathering, wear and tear can occur over time and this will have an impact upon a material’s fitness-for-purpose. | Working scientifically:* reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
* about the methods scientists use to build scientific knowledge about materials and how they can be used in different ways
* that scientists make and use observations to answer scientific questions and explain natural phenomena, that they use scientific equipment to quantify their observations and use models to help understand how systems and processes work

Scientific enquiry type:* identifying and classifying
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| 1. Which liquid is the thickest?
 | * Liquids have properties which include having: [a fixed weight, a fixed volume,] an ability to flow, a level of viscosity and they take on the shape of a container.
* Viscosity is the property of a liquid that describes how fast or slowly it will flow.
* The viscosity of a liquid describes how thick or thin it is.
* A liquid with high viscosity (thick) will flow slowly and a liquid with low viscosity (thin) will flow quickly.
 | Working scientifically:- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, [classification keys, tables, scatter graphs,] bar and line graphs- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations Scientific enquiry type:* comparative [and fair] testing
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| 1. Who invents things?
 | * Children learn more about how inventors use materials in new ways.
* They invent a new object made of a material that is fit for purpose based upon its properties.
* They think of unusual and creative uses for simple objects made from everyday materials.
* They promote and evaluate their inventions.
 | Working scientifically:* using their observations and ideas to suggest answers to questions
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| 1. Can the same material keep cold things cold and hot things hot?
 | * Children observe the disassembly of a cool bag and identify the properties of the materials used in each layer.
* They plan and carry out a comparative test to explore the properties of thermal insulators and their effect on cold and hot food.
* They collect data by taking repeat readings of temperature.
* They present multiple sets of data in a line graph.
* They use their graph to answer questions about temperature change and explain that insulation can keep hot things hot and cold things cold.
 | Working scientifically:* planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
* taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
* recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
* reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
* identifying scientific evidence that has been used to support or refute ideas or arguments

Scientific enquiry type: * Comparative testing
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| 1. Which is the best type of nappy?
 | * Children consider the purpose, functionality and properties of a nappy.
* They observe a disassembly of a disposable nappy to explore the properties of the different layers: absorbent, permeable and waterproof.
* They carry out an enquiry to identify whether the different types of nappy are easy to use, comfortable, flexible, elastic, absorbent, leak proof and waterproof.
* They explore the environmental impact of the manufacture, use and disposal of different types of nappy.
 | Working scientifically: * recording data and results of increasing complexity using scientific diagrams and labels, [classification keys, tables, scatter graphs, bar] and line graphs
* reporting and presenting 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]

Scientific enquiry type: * Fair testing
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| **Themes and links** |
| **Themes (scientific enquiry)** | **Where these are covered:** | **Links across the science curriculum** |
| **Observation over time** | * Lesson 4
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| **EYFS**  |   |
| **1**  | Seasons |
| **2**  | Growing |
| **3**  | Light |
| **4**  | Electricity |
| **5**  |  |
| **6** | Classification of living things |

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| **Research** |  |
| **Pattern seeking** | * Lesson 1
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| **Comparative and fair testing** | * Lesson 3
* Lesson 5
* Lesson 6
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| **Identifying, classifying and grouping** | * Lesson 2
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