<table>
<tr><th colspan="2">Year 5 – Materials (Materials and changes of state)</th></tr>
<tr><td>Links made with other subjects</td><td></td></tr>
<tr><td>The BIG Question</td><td>What are things made from and why?</td></tr>
<tr><td>The BIG Outcome</td><td>Powerpoint/ poster with different objects with different materials. Children explain how their properties allow them to achieve their purpose.</td></tr>
<tr><td>Science objectives (link to NC)</td><td>- 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
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</td></tr>
<tr><td>Prior knowledge
What prior knowledge is needed for children to be successful in this unit?</td><td>Children already know:
EYFS – Understanding the world - Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.
Yr 1 - Comparing and Identifying materials
Yr 2 - Changing shape and uses of material
Yr 4 - Changes of State</td></tr>
<tr><td>Future learning
Consider the conceptual knowledge within a subject that pupils need for future learning not just the recall of facts but the importance of concepts</td><td>This unit gives prior knowledge to:
KS3 -Chemical reactions as the rearrangement of atoms.
• Representing chemical reactions using formulae and using equations.
• Combustion, thermal decomposition, oxidation and displacement reactions.
• Defining acids and alkalis in terms of neutralisation reactions.
• The pH scale for measuring acidity/alkalinity; and indicators.</td></tr>
<tr><td>Science strands</td><td><u>Related Enquiry Questions</u>
<table>
<tr><td>Classifying</td></tr>
<tr><td>Based on the children’s own criteria:
- classify the materials themselves e.g. samples of wood, metal, plastic, etc.</td></tr>
<tr><td>Observing over time</td></tr>
<tr><td>Not relevant</td></tr>
<tr><td>Pattern Seeking</td></tr>
<tr><td>Not relevant</td></tr>
<tr><td>Comparative testing</td></tr>
<tr><td>-Which material would be good for a tent?
- Which material would be good to make a tea bag from?
-Which materials keep things warm/cold?
- Which material would be good for a bag for different purposes?</td></tr>
<tr><td>Researching</td></tr>
<tr><td>Not relevant</td></tr>
</table></td></tr>
<tr><td>Vocabulary/ Glossary</td><td>Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material, sediment</td></tr>
<tr><td>Knowledge
(see italics for knowledge to remember)</td><td>The knowledge that children will learn and remember:
1. Materials have different uses depending on their properties and state (liquid, solid, gas).</td></tr>
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	2. Children need to classify different objects made out of the same material using the properties of the material. (softer plastic, thinner etc) 3. *Know examples and reason as to why. E.g Most fuels are liquids (rather than wood/coal) as it is easier to transport and fills containers* 4. *Gases could be used but are more dangerous to use due to their difficulty to contain* 5. *Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.* 6. Associate that different properties suit different purposes and that being really good/ or really bad at one thing does not make the material 'ineffective or useless' 7. *Some materials will dissolve in a liquid and form a solution(salt water, coffee, sugar) while others are insoluble and form sediment (pepper, sand)*
SEND expectations	1. *Materials have different uses depending on their properties and state (liquid, solid, gas).* 2. *Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.* 3. *Some materials will dissolve in a liquid and form a solution(salt water, coffee, sugar) while others are insoluble and form sediment (pepper, sand)*
Common misconceptions	Lots of misconceptions exist around reversible and irreversible changes, including around the permanence or impermanence of the change. There is confusion between physical/chemical changes and reversible and irreversible changes. They do not correlate simply. Chemical changes result in a new material being formed. These are mostly irreversible. Physical changes are often reversible but may be permanent. These do not result in new materials e.g. cutting a loaf of bread. It is still bread, but it is no longer a loaf. The shape, but not the material, has been changed. Some children may think: - thermal insulators keep cold in or out -thermal insulators warm things up - solids dissolved in liquids have vanished and so you cannot get them back - lit candles only melt, which is a reversible change.