

PENTECOST TERM

SCIENCE – Year 5 - Medium Term Planning – CHEMISTRY: PROPERTIES AND CHANGES OF MATERIALS

| <u>LESSON 1</u> | <u>LESSON 2</u> | <u>LESSON 3</u> |
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| <p>LEARNING INTENTION: To know that materials have different properties. (Recap Y3 magnets & Y4 electricity) To know that materials can be grouped according to their basic physical properties.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> 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. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> | <p>LEARNING INTENTION: To know that know that some materials will dissolve in liquid to form a solution.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> | <p>LEARNING INTENTION: To know that some mixtures can be separated by sieving.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> |
| <p>Key Vocabulary: property, definition, absorbent, electrically conductive, magnetic, reflective</p> | <p>Key Vocabulary: solubility, solutes, solvents, dissolve</p> | <p>Key Vocabulary: mixture, reversible, sieving, solids, separate</p> |
| <p>Recap & retrieval</p> | <p>Recap & retrieval <i>Different materials have different properties.</i></p> | <p>Recap & retrieval</p> <ul style="list-style-type: none"> <i>Different materials have different properties.</i> |

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| | | <ul style="list-style-type: none"> Solubility is a measure of a material's ability to dissolve in a solvent. |
| <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> Materials' properties makes them suitable for specific purposes. Different materials have different properties. <p>Teacher:</p> <ul style="list-style-type: none"> Various tests can be carried out to investigate which properties materials have. Materials can be grouped according to their basic physical properties. Properties include hardness, solubility, transparency, conductivity (electrical and thermal) and magnetism. | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> Solubility is a measure of a material's ability to dissolve in a solvent. A material is soluble if it can dissolve in a solvent to form a solution. A material is insoluble if it cannot be dissolved in a solvent to form a solution. <p>Teacher:</p> <ul style="list-style-type: none"> Some materials (solutes) will dissolve in liquid (solvents) to form a solution. Dissolving is when a solute becomes incorporated into a solvent and can no longer be seen. Dissolving can also happen with other states of matter. Air is a mixture of dissolved gases. Carbon dioxide gas is dissolved into liquids to make drinks fizzy. | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> Some mixtures can be separated by sieving. Sieving can be used to separate large solids from liquids and some solids from other solids. <p>Teacher:</p> <ul style="list-style-type: none"> A mixture is a combination of two or more substances that aren't chemically joined and can be separated back into their individual substances. |

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| LESSON 4 | LESSON 5 | LESSON 6 |
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| <p>LEARNING INTENTION: To know that some mixtures can be separated by filtration.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> | <p>LEARNING INTENTION: To know that some mixtures can be separated by evaporation.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> | <p>LEARNING INTENTION: To know that reversible changes include heating, cooling, melting, dissolving and evaporating.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Demonstrate that dissolving, mixing and changes of state are reversible changes. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> |
| <p>Key Vocabulary: filtration, filter, solid, liquid, particles</p> | <p>Key Vocabulary: evaporation, homoegenous, mixtures, investigation, reversible, solvent, solid, liquid</p> | <p>Key Vocabulary: reversible, changes, heating, melting, cooling, dissolving, solution, evaporating, molecules, states of matter</p> |
| Recap & retrieval | Recap & retrieval | Recap & retrieval |

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| <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. | <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. • Filtration can be used to separate small solids from liquids. | <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. • Filtration can be used to separate small solids from liquids. • Evaporating can be used to separate dissolved solids from liquids. |
| <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Filtration can be used to separate small solids from liquids. • Filters separate small solid particles from liquids or gases using a filter. <p>Teacher:</p> <ul style="list-style-type: none"> • Filters can be made from thin materials that contain tiny holes or layers of solid materials, such as sand, gravel or charcoal. | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Evaporating can be used to separate dissolved solids from liquids. • Evaporating involves heating a solution until the solvent changes states from a liquid to a gas. <p>Teacher:</p> <ul style="list-style-type: none"> • Some homogeneous mixtures, such as seawater, can be separated into their different parts by evaporating. • When all the solvent has evaporated, the solute is left behind. • The solvent is usually lost during evaporation. | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Reversible changes include heating, cooling, melting, dissolving and evaporating. • Reversible changes happen between the three main states of matter: solids, liquids and gases. <p>Teacher:</p> <ul style="list-style-type: none"> • Reversible changes can be reversed or changed back to recover the original materials. • They are physical changes, which means no new materials are formed, and recovered materials are the same, even if they look or feel different. • . |

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| LESSON 7 | LESSON 8 | LESSON 9 |
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| <p>LEARNING INTENTION: To know that irreversible changes include burning, rusting, decaying and chemical reactions.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> 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. <p>Aim: Develop scientific knowledge and conceptual understanding through the specific disciplines of chemistry.</p> | <p>LEARNING INTENTION: To know that thermal conductors conduct heat.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. <p>Aim: Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.</p> | <p>LEARNING INTENTION: To know that thermal insulators do not conduct heat.</p> <p>Disciplinary knowledge:</p> <ul style="list-style-type: none"> Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. <p>Aim: Develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them.</p> |
| <p>Key Vocabulary: physical, chemical reaction, irreversible changes, decaying, burning, rusting</p> | <p>Key Vocabulary: thermal conductors, particles, metallic bonds , electrical conductivity</p> | <p>Key Vocabulary: thermal insulator, non-conductive, materials</p> |
| Recap & retrieval | Recap & retrieval | Recap & retrieval |

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| <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. • Filtration can be used to separate small solids from liquids. • Evaporating can be used to separate dissolved solids from liquids. • Reversible changes include heating, cooling, melting, dissolving and evaporating. | <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. • Filtration can be used to separate small solids from liquids. • Evaporating can be used to separate dissolved solids from liquids. • Reversible changes include heating, cooling, melting, dissolving and evaporating. • Irreversible changes include burning, rusting, decaying and chemical reactions. | <ul style="list-style-type: none"> • Different materials have different properties. • Solubility is a measure of a material's ability to dissolve in a solvent. • Sieving can be used to separate large solids from liquids and some solids from other solids. • Filtration can be used to separate small solids from liquids. • Evaporating can be used to separate dissolved solids from liquids. • Reversible changes include heating, cooling, melting, dissolving and evaporating. • Irreversible changes include burning, rusting, decaying and chemical reactions. • Thermal conductors conduct heat. |
| <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Irreversible changes include burning, rusting, decaying and chemical reactions. <p>Teacher:</p> <ul style="list-style-type: none"> • Irreversible changes are usually accompanied by one or more of these signs: a gas is produced; light is produced; a smell is produced or the smell changes; the colour changes; sound is produced, or the temperature changes | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Thermal conductors conduct heat. • Solid metals are good thermal conductors because their particles are closely packed and they have strong, lattice metallic bonds. <p>Teacher:</p> <ul style="list-style-type: none"> • Thermal conductivity is a measure of a material's ability to conduct heat. • Liquids and gases are poor conductors of heat because their particles are further apart • Materials can be thermally conductive or thermally non-conductive. • Thermally conductive materials allow heat to pass through them. • Whether a material is thermally conductive or thermally non-conductive depends on its state of matter and how its particles are arranged. | <p>Key Knowledge:</p> <p>Child:</p> <ul style="list-style-type: none"> • Thermally non-conductive materials do not allow heat to pass through them. • They are thermal insulators. • Liquids and gases are thermally non-conductive because their particles are far apart. <p>Teacher:</p> <ul style="list-style-type: none"> • Whether a material is thermally conductive or thermally non-conductive depends on its state of matter and how its particles are arranged. • Some solids, such as plastic, wood and glass, do not have these strong metallic bonds so they do not conduct heat. |

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| | <ul style="list-style-type: none">• Solid metals are good thermal conductors because their particles are closely packed and they have strong, lattice metallic bonds.• When heat is applied to a metal, the particles vibrate and the bonds transfer heat energy to adjacent particles. | |
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Assessment

Cumulative quiz. Retrieval practice.