# St Mark's C of E Primary School: Medium Term Planning
# Science: Cycle B Autumn Term

**KS1 Autumn 1 and 2**

**Unit Focus** **Everyday Materials & Seasonal Changes**

**Rationale:** This unit was not covered in Cycle A. It needs to be taught in Cycle B so that Year 2 will have the necessary knowledge to progress onto identifying properties of rocks, and states of matter in Year 3. The units have been organised so the children will be taught the Year 1 content in the first half of the term and then move onto the Year 2 content in the second part of the term. Seasonal changes will be covered before October half term where changes associated with autumn will be observable.

**NC Objectives:**

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties.
- observe changes across the four seasons
- observe and describe weather associated with the seasons and how day length varies.

| | **Learning Objective**<br>What is being learned rather than what is being done | **Resources**<br>Any links to resources. | **End-point knowledge**<br>What knowledge should children have gained by the end of the lesson?<br>This will be the focus of retrieval activities and monitoring. |
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| 1 & 2 | **LO: To identify and name different materials.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: hard, soft, rough, smooth, shiny**<br>- Children recognise and can name the following materials, wood, plastic, glass, metal, water, rock.<br>- Children use **suitable** adjectives to describe the materials. These might include – hard, soft, smooth, rough fluffy, shiny, wet, runny, clear. |

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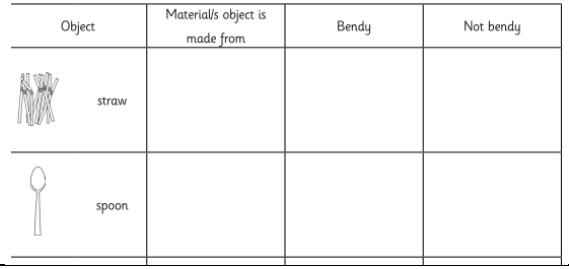
| 3 | **LO: To know the difference between an object and the material it is made from.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: object, material, wood, glass, plastic, metal**<br>- Children are able to identify objects that are made of wood, glass, plastic and metal.<br>- Children can group objects that are made from the same material.<br>- Children recognise that objects can be made from more than one material.<br>  <br>  |
| 4 & 5 | **LO: To describe properties of everyday materials.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, property / ies, bendy, stretchy, dull, stiff**<br>**-** Children can identify properties of different materials,<br>1 – hard or soft<br>2 - rough or smooth<br>3 – bendy or not bendy<br>4 - shiny or dull<br>2 – stretchy or stiff<br>  <br>- Children can record their results accurately in a table. For example,<br>  |

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| **Seasonal Changes (3 Lessons)** | | | |
| 6 | **LO: To recognise all four seasons and some differences between them.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary:**<br>- To know the names of all four seasons.<br>- To know that the season of autumn is during September, October & November.<br>- As summer turns to autumn, the days get shorter and the nights get longer. |
| 7 | **LO: To describe changes in the weather in autumn.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: weather, temperature, foggy, misty, damp**<br>- Children can talk about the types of weather we usually get in autumn.<br>- Children can talk about what happens to the temperature in autumn.<br>- Children can talk about the types of clothes they need to wear in autumn. |
| 8 | **LO: To observe the signs of change in autumn.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: pine cones, conkers, deciduous, evergreen**<br>- Children are able to identify the changes that they can see in autumn, including leaves changing colour / falling, pine-cones, conkers.<br>- To know the difference between deciduous and evergreen trees. |
| **HALF TERM** | | | |
| 9 & 10 | **LO: To compare everyday materials based on their properties.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, property / ies, stretchy, bendy, shiny, dull, stiff**<br>- Children to use grouping and sorting tasks such as hoops, tables, Venn diagrams to sort materials which have the same properties.<br>- Children to be able to sort materials into the following groups,<br>1 – hard or soft<br>2 - rough or smooth<br>3 – bendy or not bendy<br>4 - shiny or dull<br>2 – stretchy or stiff |

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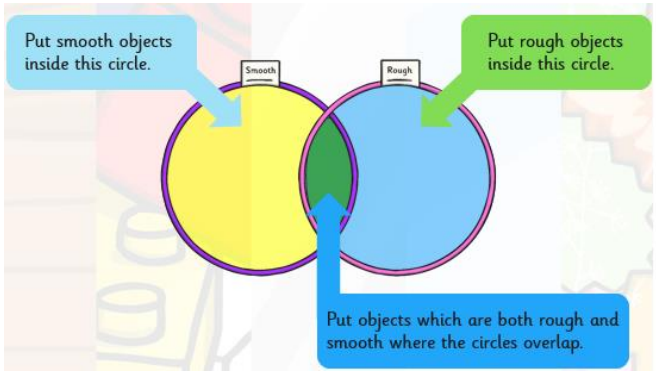
| | | | - Children can explain why some materials / objects can fall into more than one group.<br>  |
| 11 | **LO: To identify materials as opaque or transparent.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, opaque, transparent**<br>- Children can identify whether a material is transparent or opaque.<br>- To identify some objects that are made of opaque ***and*** transparent materials and discuss why.<br>   |
| 12 | **LO: To identify whether different materials are waterproof or non-waterproof.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: waterproof, non-waterproof, absorbent , non-absorbent, material**<br>- A waterproof material does not absorb water; it is non-absorbent.<br>- A non-waterproof material absorbs water; it is absorbent.<br>- Children can identify materials that are waterproof and non-waterproof. |

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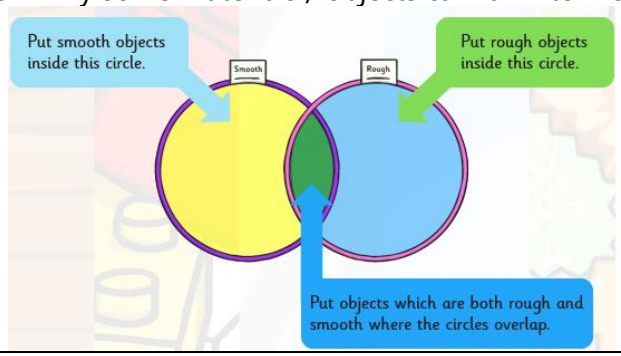
| 13 | **LO: To investigate which is the most effective waterproof material.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: waterproof, non-waterproof, material, investigate, results.**<br>- Children to ask simple questions.<br>- Children can carry out a simple test to find out ***how*** waterproof a material is.<br>- Children can their record results<br>- Children can answer questions using their results. |
| 14 | **LO: To investigate which is the most absorbent material.**<br><br>***(Supplementary Lesson if needed)*** | Experiment - Absorption.docx | **Vocabulary: absorbent, non- absorbent, material, investigate, results.**<br>- Children to ask simple questions.<br>- Children can carry out a simple test to find out ***how*** absorbent a material is.<br>- Children can their record results<br>- Children can answer questions using their results. |
| 15 | **LO: To group materials with the same properties.**<br><br>1 opaque or transparent<br>2 waterproof or non-waterproof | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: group, sort, opaque, transparent, waterproof, absorbent.**<br>- Children to use grouping and sorting tasks such as hoops, tables, Venn diagrams to sort materials which have the same properties.<br>- Children to be able to sort materials into the following groups,<br>1 opaque or transparent<br>2 waterproof or non-waterproof<br>- Children can explain why some materials / objects can fall into more than one group.<br>  |

**LKS2 Autumn 1 & 2**

**Unit Focus** **Electricity**

**Rationale:** This unit was not covered in Cycle A. It was last taught in the interim MTP in Spring 1 2022. It must be covered in Cycle B so Year 4 will have been taught the content of this unit before they move to UKS2, where they will build on this knowledge in Year 6.

**NC Objectives:**

- identify common appliances that run on electricity.
- construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- 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.
- recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- recognise some common conductors and insulators, and associate metals with being good conductors.

| | **Learning Objective**<br>What is being learned rather than what is being done | **Resources**<br>Any links to resources. | **End-point knowledge**<br>What knowledge should children have gained by the end of the lesson?<br>This will be the focus of retrieval activities and monitoring. |
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| 1 | **LO: To identify common appliances that run on electricity.** | Twinkl<br>https://www.twinkl.co.uk<br>Grammarsaurus<br>https://grammarsaurus.co.uk/portal/ | **Vocabulary: electrical, appliance, battery, mains (electricity), plug, socket**<br><br>- Know that electrical appliances can run on batteries or mains electricity.<br>- Batteries need to be charged using mains electricity.<br>- Be able to identify some electrical appliances that run on batteries.<br>- Be able to identify some electrical appliances that run on mains electricity.<br>- Be able to identify some electrical appliances that can run on batteries or mains electricity. |

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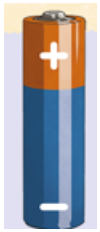
| 2 | **LO: To construct a simple circuit and name its parts.**<br><br>**(Bulbs only)** | Twinkl<br>https://www.twinkl.co.uk<br>Grammarsaurus<br>https://grammarsaurus.co.uk/portal/ | **Vocabulary: cell, battery, bulb, filament, component, circuit**<br><br>- To know that scientifically, this is called a cell<br>  <br>- Two or more cells make a battery<br>- To identify, and name cells, wires, bulbs.<br>- To be able to construct a simple circuit using these components.<br>- To know how to connect the wires to the components correctly.<br>- To know what a 'series' circuit is. |
| 3 | **LO: To construct a simple circuit and name its parts.**<br><br>**(buzzers and motors)** | Twinkl<br>https://www.twinkl.co.uk<br>Grammarsaurus<br>https://grammarsaurus.co.uk/portal/ | **Vocabulary: component, cell, battery, bulb, circuit, buzzer, motor**<br><br>- To identify, and name cells, wires, buzzers and motors.<br>- To be able to construct a simple circuit using these components.<br>- To know how to connect the wires to the components correctly.<br>- To know what a 'series' circuit is.<br>- |
| 4 & 5 | **LO: To identify complete and incomplete circuits.** | Twinkl<br>https://www.twinkl.co.uk<br>Grammarsaurus<br>https://grammarsaurus.co.uk/portal/ | **Vocabulary: circuit, complete, component, complete, incomplete, flow (of electricity)**<br><br>- In a complete circuit, electricity can flow.<br>- Complete circuits need a power supply (battery) and wires that connect the components.<br>- In an incomplete circuit, there is a break somewhere in the circuit that prevents the electricity from flowing.<br>- Reasons for incomplete circuits include.<br>1. A faulty component<br>2. Components not connected correctly.<br>3. Wires not connected correctly. |

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| 6 | **LO: To construct circuits with switches.** | Twinkl https://www.twinkl.co.uk Grammarsaurus https://grammarsaurus.co.uk/portal/ | **Vocabulary: circuit, complete, component, buzzer, motor, flow (of electricity).**<br><br>- Know that for electricity to flow, the circuit needs to be complete.<br>- Know that a switch opens and closes the circuit.<br>- When the switch is 'open' it breaks the circuit (incomplete), which stops the flow of electricity so the bulb will not light.<br>- When the switch is 'closed' it completes the circuit which allows the electricity to flow so the bulb lights up. |
| 7 & 8 | **LO: To make a 3D model that is powered by an electrical circuit.** | Electric model.pdf | **Vocabulary: circuit, component, motor.**<br><br>- To identify, and name cells, wires, switches and motors.<br>- To be able to construct a simple circuit using these components.<br>- To know how to connect the wires to the components correctly.<br>- Explain how the electric circuit and the components make the model work. |
| 9 | **LO: To investigate which materials are good electrical insulators and conductors** | Twinkl https://www.twinkl.co.uk Grammarsaurus https://grammarsaurus.co.uk/portal/ | **Vocabulary: equipment, method, conductor, insulator, component, circuit**<br><br>- Ask scientific questions and plan a suitable scientific enquiry.<br>- Plan a suitable scientific enquiry to answer a question.<br>- Identify equipment needed.<br>- Understand how to carry out a fair test.<br>- Plan a suitable method. |
| 10 | **LO: To investigate which materials are good electrical insulators and conductors.** | Twinkl https://www.twinkl.co.uk Grammarsaurus https://grammarsaurus.co.uk/portal/ | **Vocabulary: observation, conclusion, conductor, insulator, component, circuit**<br><br>- Make careful observations.<br>- Record results accurately.<br>- Use results to make a conclusion using scientific knowledge to support.<br>- Know which materials are good conductors and insulators.<br>- That metal is a good electrical conductor. |

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| 11 | **LO: To understand everyday uses of electrical conductors and insulators.** | Twinkl https://www.twinkl.co.uk Grammarsaurus https://grammarsaurus.co.uk/portal/ | **Vocabulary: conduct, insulator, conductor**<br><br>- Most metals conduct electricity.<br>- The most highly conductive metals are copper, silver and gold.<br>- Aluminium, steel and brass are common conductors.<br>- Identify how electrical insulators and conductors are used in everyday life. For example, cooking utensils, plugs, kettles, irons. |
| 12 | **LO: To identify dangers associated with electricity.** | Twinkl https://www.twinkl.co.uk Grammarsaurus https://grammarsaurus.co.uk/portal/ | **Vocabulary: material, conductor, insulator, circuit, components**<br><br>- Recognise that electricity is dangerous<br>- Identify dangers in the home associated with electricity.<br>- Understand that dangers are often associated with materials that are good conductors e.g. Metal on irons.<br>- Identify how electrical insulators are used to make things safe in the home e.g. plastic case on a plug. |
| 13<br>14<br>15 | **LO: To use insulators and conductors to make an electrical game.** | Wire Loop Games PowerPoint.ppt<br><br>Wire loop instructions.pdf | **Vocabulary: material, conductor, insulator, circuit, components**<br><br>- Explain which part of the game is made from a material that is an electrical insulator and why.<br>- Explain which part of the game is made from a material that is an electrical conductor and why.<br>- Design a circuit that will make the game work (a simple circuit with a battery, crocodile clips and a buzzer)<br>- To be able to construct a working circuit using these components. |

**UKS2 Autumn 1 and 2**

**Unit Focus** **Properties and changes of materials**

**Rationale:** This unit was not covered in Cycle A. Some objectives were covered in the interim MTP Spring 2022, but only those that were identified as gaps in children's knowledge. It must be taught in Cycle B so that Year 6 have the necessary scientific knowledge and understanding needed to move onto the nature of matter in Chemistry at KS3.

**NC Objectives:**

- 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
- know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.
- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- demonstrate that dissolving, mixing and changes of state are reversible changes
- 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.

| | **Learning Objective**<br>What is being learned rather than what is being done | **Resources**<br>Any links to resources. | **End-point knowledge**<br>What knowledge should children have gained by the end of the lesson?<br>This will be the focus of retrieval activities and monitoring. |
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| 1 | **LO: To compare and group materials based on their hardness and transparency.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, properties transparent, translucent, opaque**<br><br>- Any substance that is used to make something is a material.<br>- Use relevant vocabulary to describe the properties of materials such as, hard, soft, rough, smooth, flexible, rigid.<br>- Identify whether a material is transparent, translucent, or opaque.<br>- Be able to say why the properties of a material make it suitable for its purpose.<br>- Group materials according to their properties and explain how they have grouped them. |

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| 2 | **LO: To investigate the solubility of different materials.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: solution, dissolve, soluble, insoluble**<br><br>- To know that some materials will dissolve in a liquid to form a solution.<br>- Materials that will dissolve are known as soluble.<br>- Materials that won't dissolve are insoluble.<br>- Not all solids will dissolve, and not all liquids will allow solids to dissolve.<br>- Understand the difference between dissolving and melting.<br>- Perform a comparative and fair test. |
| 3 | **LO: To explore factors that affect the rate of dissolving.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk<br>- | **Vocabulary: dissolve, particles, transparent, solid, liquid**<br><br>- Dissolving occurs when the particles of certain solids mix with the particles of certain liquids.<br>- When a material dissolves it does not disappear. It dissolves in the liquid to make a transparent solution.<br>- A solution is formed when a solid dissolves in a liquid.<br>- Not all solids will dissolve, and not all liquids will allow solids to dissolve.<br>- The rate at which a solid dissolves can be affected by factors including, how much solid is added, how many times it is stirred and the temperature of the liquid.<br>- Perform a comparative and fair test.<br>- That dissolving is a reversible change. |
| 4 | **LO: To investigate the electrical conductivity of materials.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, flow (of electricity), conductor, insulator, resistance**<br><br>- Electricity can travel easily through electrical conductors.<br>- Some materials do not let electricity pass through them. These are known as electrical insulators.<br>- Test a variety of object such as, drinks cans, paper, coins, rubber gloves, glass, and identify whether they are electrical conductors or insulators.<br>- All materials have some electrical resistance, which opposes the flow of electricity.<br>- Electrical insulators have a very high resistance. |

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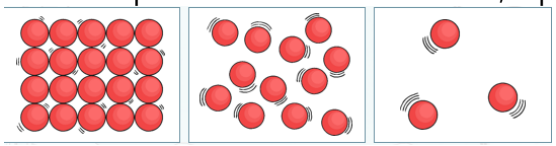
| | | | - Electrical conductors have very low resistance.<br>- Give reasons for the uses of electrical conductors and insulators.<br>- Perform a comparative and fair test. |
| 5 | **LO: To investigate thermal conductors and insulators.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: material, thermal, conductor, insulator**<br><br>- Heat can travel easily through thermal conductors.<br>- Metals are good thermal conductors, as they allow heat to move through them.<br>- Thermal insulators do not let heat travel through them easily.<br>- Some fabrics, wood and plastics are good thermal insulators.<br>- Give reasons for the uses of thermal conductors and insulators.<br>- Perform a comparative and fair test. |
| 6 | **LO: To investigate how materials respond to magnets.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: magnet, magnetic, attract**<br><br>- Some materials are magnetic and others are not.<br>- Magnets are attracted to **some** metals. They are not attracted to **all** metals.<br>- Iron is magnetic.<br>- Steel contains iron, so steel will be attracted to a magnet.<br>- Aluminium, copper, gold and silver are not magnetic.<br>- Give reasons for the use of magnetic materials.<br>- Perform a comparative and fair test. |
| 7 | **LO: To understand that materials change state.**<br><br>***(Focus: heating, cooling, melting, freezing)*** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: states, matter, particles, reversible, evaporating, condensing**<br><br>- Solids, liquids and gasses are states of matter.<br>- The position and behaviour of particles is different in solids, liquids and gasses.<br>  |

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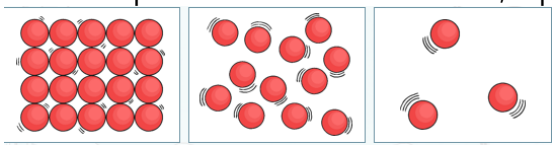
| | | | - Materials can change state.<br>- If materials can change back to their original state, this is a **reversible** change.<br>Understand how the behaviour of the particles change between the states of matter. |
| 8 | **LO: To understand that materials change state.**<br><br>***(Focus: dissolving, evaporating, condensing)*** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: states, matter, particles, reversible, evaporating, condensing**<br><br>- Solids, liquids and gasses are states of matter.<br>- The position and behaviour of particles is different in solids, liquids and gasses.<br>  <br>- Materials can change state.<br>- If materials can change back to their original state, this is a **reversible** change.<br>Understand how the behaviour of the particles change between the states of matter. |
| 9 & 10 | **LO: To use different processes to separate materials.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: mixture, solution, suspension, dissolve, sieving, filtering, evaporating**<br><br>- Identify how materials are mixed together.<br>- To know which process / processes need to be used in order to separate mixtures based on their properties.<br>- A mixture is two or more solids<br>- A suspension is a mixture of liquid and solid particles that will not dissolve.<br>- A solution is a solid dissolved in a liquid.<br>- Correctly use the processes of sieving, filtering, evaporating and magnetic attraction to separate materials |
| 11 & 12 | **LO: To identify changes of state that are irreversible.** | - Grammarsaurus https://grammarsaurus.co.uk/portal/<br>- Twinkl https://www.twinkl.co.uk | **Vocabulary: state, matter, chemical, reactant, product**<br><br>- An irreversible change is one where the material cannot return to its original state.<br>- Irreversible changes occur when there has been a chemical reaction.<br>- Chemical changes involve reactants and products. |

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| | ***(Focus: changes associated with heating and burning)*** | | - The reactants are the materials that you start off with, before the chemical change happens.<br>- The products are the materials that are formed in the chemical change. |
| 13 | **LO: To identify changes of state that are irreversible.**<br><br>***(Making plastic with milk and vinegar)*** | Plastic.pptx | **Vocabulary: state, matter, chemical, reactant, product**<br><br>- An irreversible change is one where the material cannot return to its original state.<br>- Irreversible changes occur when there has been a chemical reaction.<br>- Chemical changes involve reactants and products.<br>- The reactants are the materials that you start off with, before the chemical change happens.<br>- The products are the materials that are formed in the chemical change.<br>- This chemical reaction creates a solid: a form of plastic. |
| 14 | **LO: To observe the changes associated with acid and bicarbonate of soda.** | Bicarb of soda.pptx | **Vocabulary: state, matter, chemical, reactant, product**<br><br>- An irreversible change is one where the material cannot return to its original state.<br>- Irreversible changes occur when there has been a chemical reaction.<br>- Reactants are the materials that you start with, before the chemical change happens.<br>- The products are the materials that are formed in the chemical change.<br>- A chemical reaction creates a gas: carbon dioxide. |
| 15 | **LO: To understand how water changes from one state to another in the water cycle.**<br><br>***(Supplementary lesson if required.)*** | Water cycle in a bag.pdf | **Vocabulary: evaporation, condensation, particle, temperature, cycle**<br><br>- The heat of the Sun turns sea water into vapour, tiny droplets of water which float in the air - this process is called evaporation.<br>- Water vapour rises into the sky, and as it cools it turns back into liquid water to make clouds - the process of condensation.<br>- The sun provides the energy for a continuous exchange of moisture between the oceans, the land and the atmosphere. |

LOVING, GROWING and SUCCEEDING TOGETHER