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Primary & Nursery School

MEDIUM TERM PLAN

TERM: Autumn 2		YEAR GROUP: Year 5		SUBJECT: Science – Properties and Changes	
WEEK 1 **DATE:**	**WEEK 2** **DATE:**	**WEEK 3** **DATE:**	**WEEK 4** **DATE:**	**WEEK 5** **DATE:**	**WEEK 6** **DATE:**
LO: Knowledge To determine the hardness of materials and link this to their uses. **Working scientifically** To evaluate the hardness test to determine the degree of trust in the results. **Success Criteria: Knowledge** I can define the term hardness. I can test, compare and group hard and soft materials. I can select materials for a specific purpose based on their hardness. **Working scientifically** I can identify difficult variables to control. I can judge how variables affect the degree of trust in results. **Main Event:** Children to investigate 'How does the hardness of the materials vary?' Children to perform the 'scratch test' and write a summary of the results. **Support:** Should use the Knowledge organiser to help them define and sort hard and soft materials; could use the activity Resource: Hardness test variables (support) which provides a list of variables to choose from when evaluating their scratch test. **Challenge:** Should test additional materials that produce ambiguous results, such as soft materials like foam, sponge and cotton wool (as these materials deform easily, they will move away from the nail as it scratches, so they may not scratch despite being	**LO: Knowledge** To determine the transparency of different materials and link this to their uses. **Working scientifically** To plan and draw a table of results. **Success Criteria: Knowledge** I can define the term transparency. I can test, compare and group transparent, translucent and opaque materials. I can select materials for a purpose based on their transparency. **Working scientifically** I can identify which information should be recorded. I can draw the correct layout for the information I want to record. **Main Event:** The children will verify their classification of materials by measuring their transparency using a light meter. Children to group them into the categories 'opaque', 'transparent' and 'translucent' using the data in their results table. **Support:** Could use the Activity: Transparency table template (support) to create a table for their results when testing the transparency of different materials; could be provided with the following ranges for lux in order to categorise their materials: opaque (decrease to 0 lux), translucent (decrease of more than 10 lux), transparent (decrease of 10 lux or less); could use the Knowledge organiser to	**LO: Knowledge** To determine the conductivity of different materials and link this to their uses. **Working scientifically** To write a detailed, organised method which is easy to follow. **Success Criteria: Knowledge** I can define the terms 'thermal conductivity' and 'electrical conductivity'. I can test and compare the conductivity of different materials. I can choose an appropriate material for a specific purpose. **Working scientifically** I can write a method in a logical sequence that others can follow. I can include necessary detail in my method including variables, measurements, equipment and safety. **Main Event:** Children to write a method and conduct a comparative test to investigate the enquiry question: How does the conductivity of different materials compare? **Support:** Should use the Resource: Method word bank (support) to help them write their method, which provides three keywords for each step of the method; could use the activity Activity: Designing a spacesuit (support) during the Wrapping up. **Challenge:** Should create an additional cup wrapped in multiple layers of different materials; could be challenged to select materials that, when combined, would offer the maximum possible insulation against heat loss; should analyse how the combination of materials affected the heat retention compared to the individual materials; refine	**LO: Knowledge** To demonstrate reversible changes. **Working scientifically** To write a prediction using prior knowledge of the states of matter. **Success Criteria: Knowledge** I can define the term reversible change. I can describe how to reverse mixing and dissolving using separation techniques. I can describe how to reverse changes of state by heating and cooling. **Working scientifically** I can use previous scientific knowledge and evidence to inform predictions. **Main Event:** CT to demonstrate test and children to record findings. RA to be completed. Children to complete the Activity: Predicting reversible changes (one each). Lead a class discussion about their findings, summarising that changes of state are reversible. **Support:** Could use the Activity: Predicting reversible changes: support version to write their predictions; could use the Resource: Knowledge organiser: Science – States of matter to help them with the Recap and recall activity and with writing their predictions. **Challenge:** Should heat more than three materials (including at least one solid and one liquid) and compare and describe the differences between each of their materials; should answer the open-ended question of what would happen if changes of state were not reversible (answers may include	**LO: Knowledge** To demonstrate irreversible changes. **Working scientifically** To analyse observations about rusting and use them to support a conclusion. **Success Criteria: Knowledge** I can define the term irreversible change. I can identify and describe burning and rusting as irreversible changes. **Working scientifically** I can use observations to determine the necessary conditions for rusting. **Main Event:** Children to observe the changes (rust has formed) Children to discuss the key questions and annotate their Resource: Rusting results. Write a class conclusion. **Support:** Could focus on recording how easily each material ignited on the Activity: Observing burning; could use the Knowledge organiser to help them analyse the statements in the Recap and recall and answer the questions in the Attention grabber; should read the information under the video at the link: Irreversible	**LO: Knowledge** To demonstrate irreversible changes. **Working scientifically** To measure the circumference of a balloon accurately. **Success Criteria: Knowledge** I can identify and describe cooking and mixing vinegar and bicarbonate of soda as irreversible changes. **Working scientifically** I can measure the circumference of a balloon accurately using a string and a ruler. **Main Event:** Children to engage in experiment: mixing vinegar and bicarbonate of soda and measuring gas created. Arrange the class into groups of three and provide each group with the Resource: Knowledge organiser: Properties and changes and 11 sticky notes. Children to use sticky notes to answer the questions. **Support:** Could measure five balloons and not include the repeat data results; could use the Knowledge organiser to research the answers to the Recap and recall retrieval race. **Challenge:** Should calculate the average balloon circumference, using the repeat data; could be encouraged to consider and discuss why gathering repeat

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soft); should be encouraged to discuss why these soft materials do not scratch easily; could choose an extension activity relating to hardness from the Resource: Stretch and challenge: Properties and changes.	help them define and sort transparent, translucent and opaque materials. **Challenge:** Should test additional materials they find in the classroom; should add an extra column to their results table with the heading 'Observations' and record how the clarity of an object viewed through the different materials varies (for example, the object was clear, fuzzy, coloured, distorted, not visible); should suggest potential uses for the materials tested based on their transparency; could choose an extension activity relating to transparency from the Resource: Stretch and challenge: Properties and changes.	their designs based on the data and their observations; could choose an extension activity relating to conductivity from the Resource: Stretch and challenge: Properties and changes.	reference to the water cycle); could choose an extension activity relating to properties or reversible changes from the Resource: Stretch and challenge: Properties and changes.	changes instead of the Wrapping up activity. **Challenge:** Should write their conclusion to the rusting experiment independently; should time how long each material burnt for and record this in the last column of the table on the Activity: Observing burning; could choose an extension activity relating to reversible and irreversible changes from the Resource: Stretch and challenge: Properties and changes.	data is important (it improves the reliability of results and allows anomalies to be identified); could choose an extension activity relating to reversible and irreversible changes from the Resource: Stretch and challenge: Properties and changes.