



1.Can I compare/group materials based on properties and use evidence to explain my choices?

- **Prior Learning (Year 3—Summer):** grouped rocks by simple properties (e.g. appearance)
- **Vocab:** properties, material, hardness, transparency, magnetism, conductivity,
- Know that materials can be compared and grouped based on their properties, (e.g. hardness, transparency, magnetism and conductivity).
- Know that properties describe how a material behaves or what it is like.
- Know that different materials can share properties but still be grouped in different ways depending on the criteria used.
- Know that scientific evidence from observations helps justify how materials are grouped.

(note for teachers – suggested task: provide a range of materials (e.g. metal, plastic, glass, wood) and ask children to test and sort them based on different properties, then explain and justify their groupings using evidence from observations.)

- **Identifying scientific evidence that has been used to support or refute ideas or arguments**

2.Can I plan and carry out a fair test to investigate soluble and insoluble materials, recording results accurately (including repeat readings where appropriate)?

- **Prior Learning (last lesson):** compared and grouped materials by their properties
- **Vocab:** soluble, insoluble, solution
- Know some materials dissolve in liquid to form a solution while others don't dissolve and remain visible.
- Know that a solution is formed when a solid dissolves completely into a liquid.
- Know that a fair test involves changing one variable while keeping others the same (e.g. same amount of water, same temperature, same time).
- Know that taking repeat readings helps improve the accuracy and reliability of results.

(note for teachers – suggested task: children plan and carry out an investigation testing different materials (e.g. sugar, salt, sand) in water, ensuring fair conditions, recording results in a table, and repeating tests to check consistency.)

- **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**

3.Can I select and use different methods to separate mixtures and explain why they work using scientific evidence?

- **Prior Learning (last lesson):** investigate soluble/insoluble materials
- **Vocab:** separate, scientific evidence, filter, sieve, evaporate
- Know that mixtures can be separated using different methods depending on the properties of the materials involved.
- Know that sieving separates solids of different sizes, filtering separates an insoluble solid from a liquid and evaporation separates a dissolved solid from a liquid.
- Know that choosing a method depends on whether a material is soluble or insoluble.
- Know that scientific evidence from observations helps us explain why a separation method works.

(note for teachers – suggested task: provide mixtures (e.g. sand and gravel, sand and water, salt-water) and ask children to choose appropriate separation methods, carry them out, and explain why their choices were effective using evidence.)

- **Planning different types of scientific enquiries to answer questions**
- **Identifying scientific evidence that has been used to support or refute ideas or arguments**

6.Can I use results from investigations to make predictions and justify the best use of materials for different purposes?

- **Prior Learning (last lesson):** investigated irreversible changes and evaluated reliability
- **Vocab:** predict, investigate, prediction, scientific evidence
- Know that different materials are chosen for different purposes based on their properties.
- Know that evidence from investigations can be used to justify why a material is suitable for a specific use, (e.g. waterproof materials for coats, strong materials for building).
- Know that predictions can be made based on patterns in results and prior knowledge.
- Know scientific evidence can support or refute ideas about which materials are best for a task.
- **(note for teachers – suggested task:** show real-world problems (e.g. best material for warm jacket, wrapping ice cream, blackout curtains). Ask children to choose materials based on prior investigations, justify their decisions using evidence, and make predictions about performance.)
- **Using test results to make predictions to set up further comparative and fair tests**
- **Identifying scientific evidence that has been used to support or refute ideas or argument**

5.Can I investigate irreversible changes and use evidence to explain how new materials are formed and evaluate how reliable my results are?

- **Prior Learning (last lesson):** reversible changes using evidence and graphs
- **Vocab:** irreversible, reaction, evidence
- Know some changes =irreversible, meaning original materials can't be recovered.
- Know that irreversible changes often result in the formation of a new material, (e.g. vinegar reacting with bicarbonate of soda produces a gas).
- Know burning and some chemical reactions are examples of irreversible changes.
- Know that evidence from observations helps us explain when a new material has been formed and whether a change is reversible or not.

(note for teachers – suggested task: carry out a simple reaction such as vinegar and bicarbonate of soda, allowing children to observe changes (bubbles, gas), record results, and discuss whether the change can be reversed, including how reliable their observations are.)

- **Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary**
- **Reporting and presenting findings from enquiries, including conclusions, causal relationships**

4.Can I use evidence from investigations (including graphs where appropriate) to explain reversible changes such as dissolving and evaporation? **this lesson to be completed over 1-2 weeks******

- **Prior Learning (last lesson):** used different methods to separate mixtures
- **Vocab:** reversible, dissolve, evaporation
- Know that some changes are reversible, meaning the original material can be recovered, (e.g. salt can be recovered from saltwater).
- Know dissolving and evaporation are examples of reversible changes but are different processes.
- Know evidence from investigations (including patterns in results) helps explain reversible changes.
- Know that graphs can be used to present results and identify patterns over time or temperature.

(note for teachers – suggested task: investigate how long it takes for water to evaporate in different conditions or track dissolving over time, record results in a table and present them as a simple line graph, then use these results to explain and predict changes.)

- **Recording data/results of increasing complexity using scientific diagrams, tables and graphs**
- **Using test results to make predictions to set up further comparative and fair tests**