Nova’s Laboratory: Investigating Mixtures and Separation

Learning objective: To identify, describe, and explain methods for separating mixtures, including filtering, sieving, and evaporating.

Welcome, young scientist! Nova the owl is preparing for an experiment. Use this template to document your investigation into mixtures. You will need to identify the components of your mixture and justify the most effective method for separating them. Remember to use scientific vocabulary and think critically about why some methods work better than others.

Word bank: mixture · solution · dissolve · solute · solvent · filtration · sieve · evaporation · residue · filtrate

1. Identify your mixture: What two or more substances have you combined, and what are their physical states (solid, liquid, or gas)? (2 marks)

2. Hypothesis: Which separation technique do you intend to use? Justify why this is the most appropriate method for your specific mixture. (3 marks)

3. Compare and contrast: Why would you choose a sieve over a filter paper for a mixture of sand and water versus a mixture of stones and flour? (4 marks)

4. Explain why: If you create a solution of salt and water, why can you not use a sieve or filter paper to separate them? What process must be used instead? (3 marks)

5. Evaluation: Describe what you observed during the separation process. Did the outcome match your hypothesis? If not, what might have happened? (3 marks)

6. Justify your answer: If you were tasked with separating a mixture of iron filings, sand, and salt, explain the sequence of steps you would take to isolate each substance. (5 marks)

Extension challenge: Nova asks: 'What might happen if we tried to separate a mixture of oil and water? Research the properties of these two liquids and write a short explanation of why they do not form a solution, unlike salt and water.'