

# Nova's Laboratory: Investigating Mixtures and Separations

*Learning objective: To describe and explain methods for separating mixtures, including filtering, sieving, and evaporating, using scientific vocabulary.*

Use this scaffold to structure your scientific report on how to separate different types of mixtures. Ensure you use technical terminology and explain the reasoning behind your chosen methods.

Nova the owl has discovered a collection of messy mixtures in her laboratory and needs your expert help to separate the components.

*Word bank: dissolve · soluble · insoluble · filtrate · residue · evaporation · sieve · suspension · consequently · furthermore · in contrast · subsequently*

**1. Introduction: State the aim of your investigation. What mixture have you chosen to separate and why is it classified as a mixture? Start with: The aim of this investigation is to... (2 marks)**

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**2. Methodology: Describe the equipment you would use to separate an insoluble solid from a liquid. Explain why a sieve or filter paper is effective here. Start with: To separate the insoluble solid from the liquid, I would use... (3 marks)**

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**3. The Process of Evaporation: Explain how you would recover a solid that has dissolved in a liquid. Why does the liquid disappear? Start with: To recover the dissolved solid, I would use the process of evaporation by... (3 marks)**

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**4. Scientific Justification: Compare and contrast the properties of the substances involved in your mixture. Why does one method work for one mixture but not another? Start with: The properties of the substances determine the separation method because... (4 marks)**

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**5. Critical Thinking: What might happen if you attempted to filter a solution where the solid had completely dissolved? Justify your answer. Start with: If I attempted to filter a solution, I would observe that... (4 marks)**

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**6. Conclusion: Summarise your findings. How can you be certain that the substances have been successfully separated? Start with: In conclusion, the separation was successful because... (2 marks)**

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*Extension challenge: Imagine Nova has a mixture of sand, salt, and iron filings. Create a step-by-step flow chart detailing the precise order of separation techniques required to isolate all three materials. Explain why the order of these steps is crucial to the success of the experiment.*