

Grade 4 Science Assessment: Mixtures and Separating Materials

Learning objective: To demonstrate understanding of how to separate mixtures, including filtering, sieving, and evaporating, and to identify reversible and irreversible changes.

Read each question carefully. Show your working out for any calculations. Use your knowledge of materials and their properties to answer the questions.

Nova the owl is helping Bea the bee in her laboratory. Bea has accidentally mixed several items together during her experiments. They need to use their scientific knowledge to separate the materials so they can continue their work.

Word bank: Solution · Soluble · Insoluble · Filter · Sieve · Evaporation · Reversible · Mixture

1. Bea has a mixture of sand and water. Explain why the sand is considered 'insoluble' and suggest one method to separate it from the water. (2 marks)

2. Max the monkey has a bowl containing a mixture of paperclips and flour. Which piece of equipment should he use to separate them, and why is this the most suitable method? (3 marks)

3. Nova adds salt to a beaker of warm water and stirs until it disappears. What is the name of the mixture created, and how could Nova get the solid salt back from the water? (3 marks)

4. Give one example of a reversible change and one example of an irreversible change. Explain the difference between them. (4 marks)

5. Kit the fox finds a box of mixed items: pasta shapes, sand, and iron nails. Design a step-by-step plan to separate all three items. You may use a magnet, a sieve, and water in your plan. (8 marks)

6. If a bag of sugar costs £1.20 and a container for filtering costs £2.50, how much would it cost for Bea to buy three bags of sugar and one container? (5 marks)

Draw: Draw a labelled diagram showing how you would set up a filter funnel and filter paper to separate an insoluble solid from a liquid.



Extension challenge: Total: /25. Imagine you are a scientist; why is it important to be able to separate materials in our daily lives? Write a short paragraph explaining your answer.