Nova’s Laboratory: Separating Mixtures Challenge

Learning objective: To understand and identify the most effective methods for separating mixtures including filtration, sieving, evaporation, and magnetism.

Nova the owl has been busy in the laboratory! She has several mixtures that need to be separated back into their original parts. Read the descriptions of the mixtures below and choose the best separation method from the word bank for each one. Explain your reasoning for your choice.

Word bank: Sieving · Filtration · Evaporation · Magnetism · Picking by hand

1. 1. Nova has a bowl filled with iron filings mixed into dry sand. How should she separate the iron from the sand? (2 marks)

2. 2. Max the monkey has accidentally dropped plastic building blocks into a bucket of large gravel stones. What method should he use to separate them? (2 marks)

3. 3. Bea the honeybee has a mixture of muddy water. She needs to get the clear water out. Which method is best to remove the solid soil particles? (2 marks)

4. 4. Pip the caterpillar has a beaker containing a solution of salt dissolved in water. He wants to recover the solid salt crystals. How can he do this? (2 marks)

5. 5. Why would filtration not work for separating salt from water? Explain your answer using scientific vocabulary. (2 marks)

Draw: Draw a labelled diagram showing how you would set up a piece of filter paper in a funnel to separate a mixture of sand and water.

Extension challenge: Imagine you are running a small business selling 'Clean Water Kits'. If you had to separate a mixture of salt, sand, and iron filings, describe the sequence of steps you would take to separate all three materials completely. Would the order of your steps matter? Why?