

Choosing a method to separate mixtures

Grade 6 science (Year 7 · Class 6) · Lab

Name: _____ Date: _____ Class: _____

Can you separate three solids that are all mixed together? In this lab you use a magnet, water, filter paper and heat to separate iron filings, sand and salt. You then weigh each part to find how much of the mixture you recovered.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** MS-PS1-2

Aim

To separate a mixture of iron filings, sand and salt into its three parts, and to find the percentage of each recovered.

Equipment

- 30.0 g mixture: 3.0 g iron filings, 15.0 g sand, 12.0 g salt
- Magnet in a plastic bag
- Two beakers, stirring rod, funnel, filter paper, conical flask
- Evaporating dish, tripod and hot plate
- Balance and water

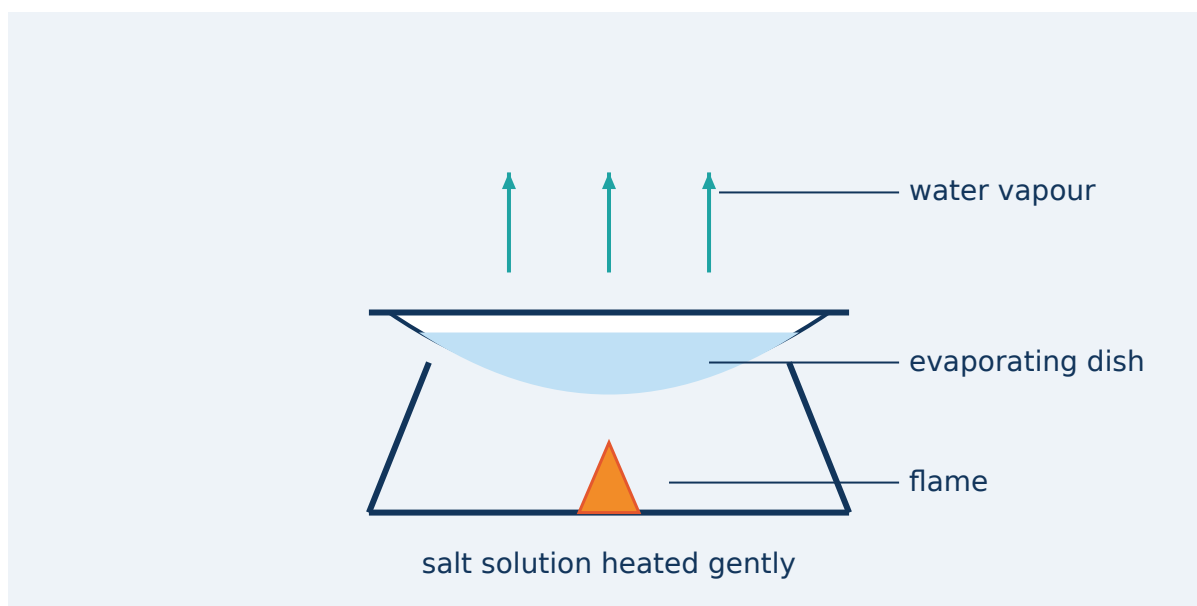
Safety

Safety

Wear goggles. Iron filings and hot salt can get into eyes. The hot plate and dish stay hot for several minutes; use tongs and let them cool. Wash your hands afterwards.

Method

1. Weigh the mixture. Run the magnet, in its bag, over it and shake the filings off into a dish. Weigh them.
2. Put the remaining mixture in a beaker, add 100 mL of water and stir for 2 min.
3. Fold the filter paper and pour the mixture through the funnel into the flask.
4. Rinse the residue with a little water, dry it and weigh the sand.
5. Heat the filtrate gently in the evaporating dish until crystals appear, then let it dry. Weigh the salt.



Step 5: recovering the salt from the filtrate.

Results

Sample measurements from one group:

Substance	Mass in mixture (g)	Mass recovered (g)
Iron filings	3.0	2.9
Sand	15.0	14.8
Salt	12.0	11.2
Total	30.0	28.9

Analysis questions

Question 1 Total recovered

Show that the total mass recovered is 28.9 g and calculate the percentage recovered.

Question 2 Percentage for each part

Calculate the percentage recovered for iron, sand and salt, to 1 decimal place.

Question 3 Largest loss

Identify the substance with the lowest percentage recovered and suggest two reasons.

Question 4 Why the magnet first?

Explain why the magnet is used before water is added.

Question 5 Where is the salt?

State what the filtrate contains and why filtering did not collect the salt.

Question 6 Missing mass

Calculate the mass lost overall and suggest where it went.

Question 7 Improve the lab

Suggest one change that would increase the percentage recovered.