

Separating mixtures: how we concentrate natural materials

Introduction

Lots of useful materials are found as part of mixtures. For example salt is found in underground deposits mixed with sand and clay. The mixture is called rock salt. If we want to use pure salt (on food, for example), we must find a way of separating the salt from the sand / clay mixture. Minerals are chemicals found naturally in the Earth. Many of them are very useful. To get at the useful minerals, we usually have to separate them from less-useful material – often called gangue (pronounced gang) by miners.

In this activity you will try to devise ways of separating some simple mixtures and then see how some of the same methods are used to separate real minerals from mixtures.

What you will need

- Marbles of two different colours
- Sand and iron filings mixture
- Sand and salt mixture
- Sawdust and sand mixture
- Sand and iron pyrites mixture
- Access to standard laboratory apparatus including beakers, flasks, funnels (and filter paper) Bunsen burners, tripods, gauzes, heatproof mats.

Safety notes

- Wear eye protection.
- Check with your teacher before trying out any of your suggestions.

What to do

There are a number of different mixtures that need to be separated. Look at the mixtures and try to think of a way of separating each of them. You can use any of the standard apparatus found in the laboratory. When you have thought of a method, check with your teacher who may let you try it out. Fill in the table as you go along. The first one has been done for you.

Mixture	Appearance of mixture at the start	What can you do to separate the two substances?	Appearance of one substance	Appearance of the other substance	What is the difference in properties that lets you separate them?
Marbles of two different colours	Different coloured marbles	Pick out marbles of one colour	Marbles of one colour	Marbles of another colour	Their different colours
Sand and iron filings					
Sand and salt					
Sawdust and sand					
Sand and iron pyrites					