

Separation Anxiety

Unmix this.

Discover the primary physical properties used to separate pure substances from mixtures.

Materials and Preparation

Mix roughly equal volumes of:

- sand
- iron filings
- salt
- popcorn kernels
- poppyseeds

Set out anything students might want to use to separate their mixtures, such as:

- test tubes
- beakers
- coffee filters
- magnets
- tape
- clear plastic wrap
- water

To do and notice

Take a few spoonfuls of the mixture and look at the individual components that make it up. Try to separate the mixture into 5 piles of pure substances. You can use anything you want.

What's going on?

Nature is mostly composed of mixtures of different substances. Much of chemistry involves separating out these substances, either to understand what they are or to use the pure components to create new substances.

There are probably many ways to separate out the 5 components of the mixture in this activity. One straightforward way is to pick out the popcorn kernels and use a magnet to pull out the iron filings. Then you can add water to the remaining mixture, which will dissolve the salt. Mix the solution and decant it through a filter. The poppyseeds are less dense than the sand and will tend to get caught in the filter rather than staying at the bottom with the sand. Both of these can now be collected and dried off. Evaporating the salt water by boiling or waiting a few days will recover the salt. The basic properties of size, magnetism, density, and solubility are common features used to recover pure substances from the mixtures that nature supplies.

This activity is based on one from David W. Brooks' excellent website: <http://dwb4.unl.edu/>