



Separating mixtures

It is possible to separate out mixtures into the substances that make them up. Some are easier to separate than others.

It is easy to mix two substances together, but much harder to separate them.

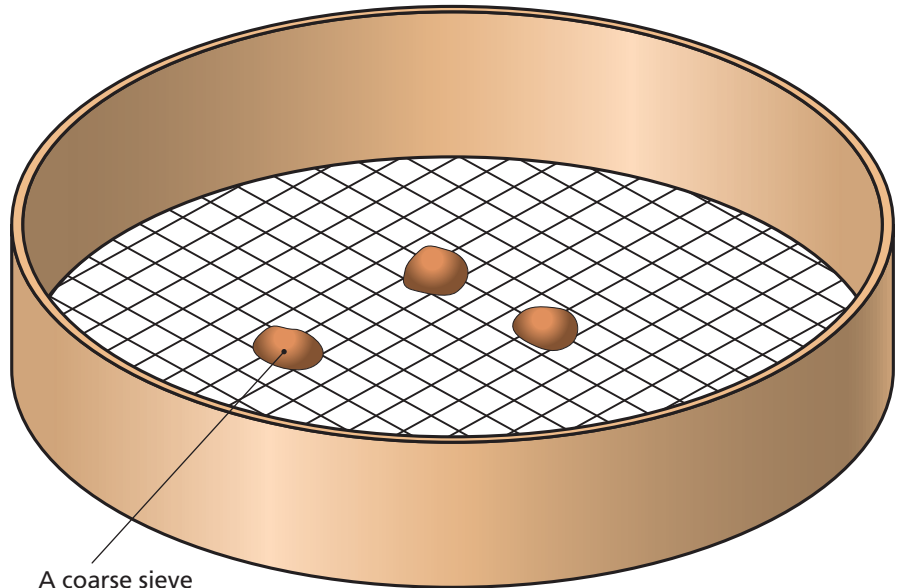
Separating different sizes

Sometimes you may have a whole range of materials of different sizes all mixed up together. A dry soil, for example, will contain stones and sand as well as fine powder called clay.

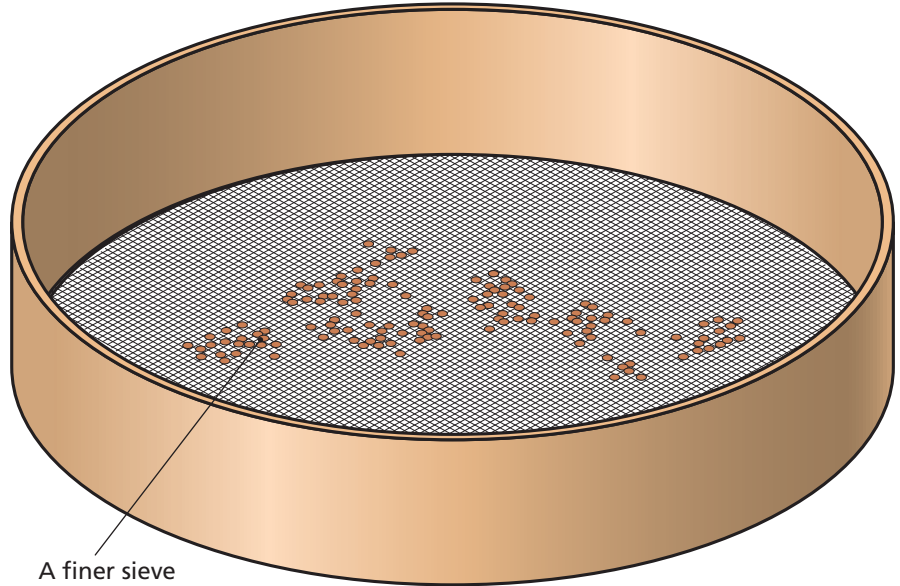
One way to separate stones from sand and clay is to use a sieve (Picture 1). This is a tray whose bottom is made of a mesh of criss-crossing wires. The larger the number of wires, the smaller the holes between the wires, and the smaller the size of material that will be trapped.

Normally, sand and stones can be separated using one sieve, and sand separated from clay using a much finer sieve.

Lumps of flour can be separated from fine flour, or flour separated from sugar, in the same way.



A coarse sieve holds back stones.



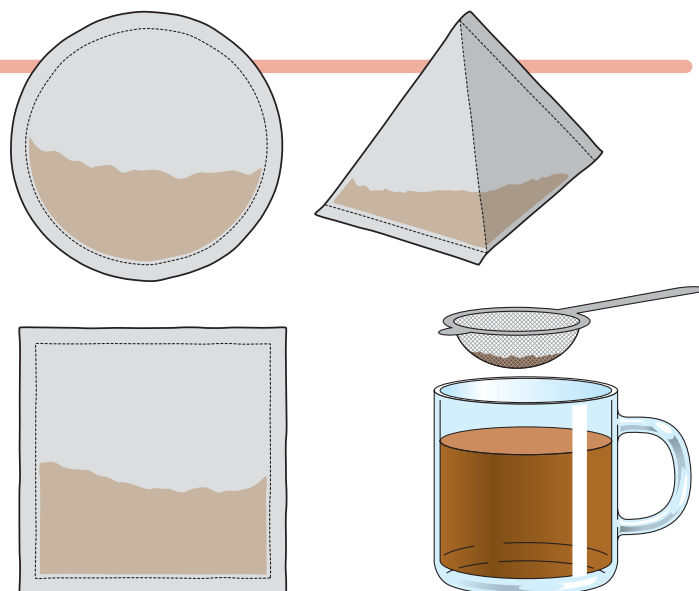
A finer sieve holds back sand.

▲ (Picture 1) Sieves are used to separate coarse pieces from fine. These two sieves can separate a soil into three groups: the larger stones are held back on the top sieve, the sand is held back on the second, and the finest material passes through the fine sieve. This could be collected in a dish.

Filtering

A filter is a much finer kind of sieve. Filters are often made of paper. They have holes that are almost too small to see.

A filter is designed to separate an insoluble solid from a liquid containing a dissolved solid. Coffee filters and tea bags are two examples of filtering (Pictures 2 and 3).



Summary

- Some mixtures are hard to separate.
- Different sizes of the same material can be separated by sieving.
- Solids can be separated from liquids by filtering.

▲ (Picture 2) Tea is available in chopped leaves, or as ground leaf in a teabag. The strainer used with tea leaves has bigger holes than the tea bags. Can you work out why?

▼ (Picture 3) A coffee filter must separate out the coffee grains from the dissolved coffee. The holes in the filter paper must be finer than any coffee grain.

