TOPICS: MIXTURES

METHODS OF SEPARATING MIXTURES

FACTS/TIPS

- Mixtures are made up of two or more substances and are physically combined so they can easily be separated.
- For example, if rice is mixed with salt the rice can be easily separated from the mixture. We can get back the rice. We can get back the salt.
- Separation is done through different means. These are called Methods of Separation. Mixtures can be separated using these methods: - Evaporation
  - Filtration
  - Sieving
  - Chromatography
  - Magnetism
  - Distillation
- Separation techniques are physical methods. Which technique to use depends on the different properties of the substances mixed e.g. different states, solubility, boiling and melting points etc.

Evaporation
Evaporation is used to separate a soluble substance from a liquid. The solution is heated so that the liquid boils and becomes vapour leaving the solid only.

Evaporation takes place at a specific temperature called the boiling point of liquids. For example, copper sulfate is soluble in water – its crystals dissolve in water to form a copper sulfate solution. During evaporation, the water evaporates away leaving solid copper sulfate crystals behind.

After all of the solvent is evaporated the solid remains in the dish. This method is used widely to separate e.g. salt from seawater.

Filtration

Filtration is a method for separating an insoluble solid from a liquid, like in a suspension.

When a mixture of sand and water is filtered: the sand stays behind in the filter paper (it becomes the residue) and the water passes through the filter paper (it becomes the filtrate).
- Sometimes some mixtures have to be filtered and evaporated to get back all the substances.

Diagram showing filtration method.

Sieving

- With this method, a device with meshes (sieve/strainer) is used through which finer particles of a mixture (as of ashes, seeds or flour) of various sizes may be passed to separate them from thicker ones, and through which the liquid may be drained as in liquid-containing material.
- The sieve prevents the large particles which cannot pass through the holes in the sieve and retains them on the sieve.
- This method is used commonly in our kitchens, gardens etc.
- Sieving is used largely in flour mill or at construction sites. In flour mill, impurities like husks and stones are removed from wheat. Pebbles and stones are removed from sand by sieving on construction sites.
ON YOUR OWN

1. Give one reason why mixtures can be separated.
   _______________________________________________________

2. List four ways by which we can separate the substances in mixtures.
   _______________________________________________________
   _______________________________________________________

3. The students in your science class made the following mixtures. Write a suitable method of separation for each mixture.
   a. sugar + flour _________________________________________
   b. salt + water _________________________________________
c. curry powder + water. 

4. Imagine you made a mixture of water and sand. State the methods you would have to use to separate the substances.

   ____________________________________________

5. Describe each method listed in question 4.

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________

**HOMEWORK**

**Study the picture below then answer the questions.**

1. Name and explain the process in the picture.

   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
2. Name two materials that might be separated by the men.

_______________________________________________________

_______________________________________________________

3. What is the name of the device used?

_______________________________________________________

4. Name one mixture you might use this method with at your home.

_______________________________________________________

_______________________________________________________

5. Draw and label diagrams to illustrate the methods below.
   1) Evaporation
   11) Filtration