

RS•C

8. Iron in breakfast cereal

Topic

Separation, magnetism, chemical analysis.

Timing

30 min.

Description

Students examine cereal with a magnet. They extract the iron from a sample of the cereal.

Apparatus and equipment (per group)

- ▼ Mortar and pestle
- ▼ 250 cm³ Beaker
- ▼ Very strong magnet (neodymium magnet). These magnets are available as electronics parts and are also recoverable from old computer disk drives.

Chemicals (per group)

- ▼ Iron-fortified breakfast cereal (eg Kellogg's[®] cornflakes).

Teaching tips

One suggestion is to begin by asking students to try to make the cereal stick to the magnet or move the flakes round the table. The cereal does not stick and friction is too great to allow the flakes to move on the table or bench surface. Elicit from students the idea to float the cereal, then hand out the worksheet. Instruct the students to keep the magnet away from the powdered cereal.

Background theory

Iron reacts with acid in the stomach and is eventually absorbed through the small intestine. If all the iron from the body were extracted, there would be enough for two small nails. Iron is essential for the production of haemoglobin.

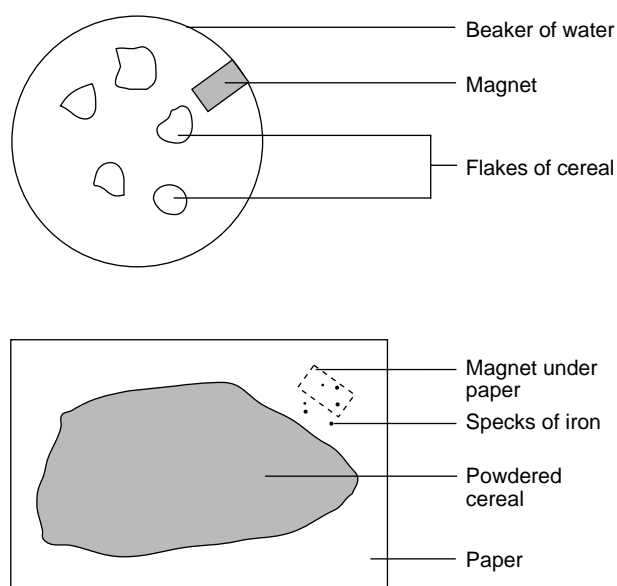
Answers

1. No.
2. Fatigue, reduces resistance to disease, and increases heart and respiratory rates.

Iron in breakfast cereal

Introduction

Many breakfast cereals are fortified with iron. This iron is metallic and is added to the cereal as tiny particles of food grade iron before packaging. This experiment involves extracting the iron.



What to do

1. Float four to six pieces of cereal on the surface of a beaker of water.
2. Hold a magnet close to the cereal and see if this can cause a piece to move.
3. Put some cereal into a mortar and use a pestle to produce a very fine powder.
4. Spread the powder on a piece of paper.
5. Put a magnet under the paper and move the paper over the magnet.
6. Observe closely in the region of the magnet as the cereal moves over it.

Questions

1. Are all metals attracted to a magnet?
2. What are the symptoms of iron deficiency in the diet?