

Activity: Extracting Iron from Cereal

When minerals are mined from caves or pits, they are dug out along with dirt and other minerals. You could call this mixture of minerals and dirt the “source material” The desired mineral needs to be separated, or extracted from the source material. There are lots of methods used extract minerals and today you are going to do a mineral extraction of your own!

The mineral you are going to extract today is iron. People need the mineral **iron** to stay healthy. Iron occurs naturally in many foods (like meats) and are often added to processed foods we eat, like cereal. You'll remember that iron is also mined from the earth to make steel! Today, you are going to extract iron from the other materials and minerals in the cereal.

Some of the methods you'll use in this activity are similar to methods used to extract and process iron and other minerals after they are mined!

Purpose

To gain an understanding of how minerals are extracted from the “source material” dug out of mines.

Materials (per group of 2)

2 plastic sandwich bags
Handful of cereal high in iron content (try Total)
~ 1 cup water (warm if possible)
Text book or object you can use to crush cereal
Magnet
Paper towels or rags (for leaks)
Duct tape or masking (optional)



Crushed up Total cereal

Procedure

1. Place ~1 cup (a couple handfuls) of cereal into the plastic bag.
2. Use a textbook or other heavy object to crush up the cereal.
3. Put crushed up cereal into a new bag. (You want to use a new bag because crushing the cereal often creates small holes in the plastic bag, and you need your bag to be

leak-proof.)

4. Carefully pour water into your bag, until the bag is one-half to two-thirds full.
5. Leave a little air in the bag and seal the bag very well. You may choose to place tape over the opening to ensure no water will leak out. Swish the water around and check for leaks.
6. Wait at least 10 minutes, but depending how crushed your cereal is you may need to wait longer. Leaving the cereal to soak overnight is also an option.
7. Place a magnet in the palm of your hand. Place the bag over magnet, so the bag is sideways (careful of water leaking out) and swish the mushed up cereal around in the bag around for 20-30 seconds.
8. **Keep the magnet attached to the bag.** Carefully turn the bag over, since you are keeping the magnet attached, the magnet should now be on the top of the bag, as in the picture. Squeeze the bag **gently** so that there is air in the bag right underneath the magnet.
9. **Slowly** take the magnet off. Don't let water or mushed up cereal touch the bag directly beneath the magnet. Do you see small black flakes on the bag where the magnet was? Those are iron flakes.
10. Run the magnet over the bag where the iron flakes are located. What happens?
11. Repeat steps 7-10 and take pictures of the iron you extracted.



After "swooshing", carefully turn your bag over while leaving the magnet pressed against the bag. Notice how there is air in the bag underneath the magnet. This is what you want!

Can you find the iron filings in this picture?

Going Further and Questions:

1. Why did you need to crush and soak the cereal to get the iron out?
2. Take a dry flake of cereal and try to pick it up with your magnet. Does the cereal stick to the magnet? Why or why not?
3. Is the extraction of iron from cereal similar to any mineral extraction techniques you read about or saw on video?