Iron for Breakfast
Contributed by: Discovery Place

Objective
Extract reduced iron from foods and examine what makes iron beneficial to our diets.

What You Need
- Non-metal cup or bowl
- Ring magnet
- Pencil
- 2 Plastic sandwich bags
- 1 packet of Instant Unflavored Oatmeal or Grits (check ingredient panel to make sure that it contains reduced iron)
- White paper
- Rubber band
- Roll of cellophane tape
To Do and Observe

1. Tape a ring magnet to a pencil as shown.

2. Insert the pencil into a plastic sandwich bag and fasten with a rubber band. If the sandwich bags are thin, use 2 of them to prevent the pencil from piercing the bag.

3. Pour one packet of the oatmeal or grits into the cup or bowl.

4. Stir the oatmeal/grits in the container with the magnet end for 3 to 5 minutes.

5. Remove the bag from the bowl or cup and closely look at it. You may not see any filings on the outside of the bag. This is OK.

6. Hold the bag, with the magnet still in it, over a piece of white paper. Now, untie the bag and take the magnet-pencil out of the bag, allowing small pieces of iron, mixed with the oatmeal/grits to fall onto the paper. You still may not see the iron.

7. Take the ring magnet off the pencil and place it under the paper and move it around. You should see the grayish bits or iron collect over the magnet.
8. After you have collected the iron, while the magnet is still holding them, gently blow away the grits or oatmeal from the paper. What remains on the paper, still held by the magnet, is the "reduced iron" listed on the ingredients.

**What's Going On**
Cereals are fortified by adding either an iron compound such as ferric phosphate, or by adding reduced iron. Reduced iron is another name for food grade iron filings, which are simply small, edible pieces of iron. Any food, especially cereal, which has reduced iron listed as an ingredient, contains these iron filings.

The iron filings you see are safe to eat. When the iron mixes with stomach acid, it changes to a form that your body can absorb easily. Our bodies usually absorb only 5-15% of the iron in the food that we eat, and puts it to use to produce hemoglobin, a chemical in the red blood cells that binds to oxygen and allows blood to transport oxygen throughout our bodies. A person who has an iron deficiency produces fewer, smaller and less effective red blood cells. If all the iron in your body were extracted, you would have enough iron to make two small nails.

You are able to separate the iron from the rest of the oatmeal/grits ingredients with the help of the magnet. The iron metal is attracted to the magnet. The plastic bag keeps the iron from sticking to the magnet. When you
remove the magnet from the plastic bag, the iron will drop down on the paper where you can easily collect and examine it.

**Parent/Teacher Tips**

**For Older Children**

Have the students look at a few different types of cereal, they can take a closer look using a microscope if one is available, and try to determine which ones contain iron. Then use the magnet device to test their predictions. They can also compare brands of the same type of cereal to see which contains the most iron. NOTE: Some cereals will need to be crushed with a rolling pin to make it easier to extract the iron.

**Cool Links**

http://pbskids.org/itsmylife/body/foodsmarts/article2.html
http://www.chem.purdue.edu/gchelp/liquids/tension.html