NAME _____

Get the Iron Out--of Your Breakfast Cereal

Introduction

What does your breakfast cereal have in common with Earth's crust? They both have some of the same materials in them. It might seem strange to compare a bowl of cornflakes to a pile of dirt. But science can help us find one of the most common elements on Earth in your cereal: iron.

Even though iron only makes up less than 5 percent of the mass on Earth, it is found in a lot of places: rocks, cereal—and even in your blood! It's also the most frequently used metal on the planet; it makes up most of steel, which is a mixture of iron and other ingredients.

Background

If you have ever seen rocks or dirt that have a red or orange tint to them, they most likely contain iron; iron tends to rust when it is exposed to oxygen, causing that rusty red color on old metal objects—or rocks! Iron also plays an important role in our bodies. It is found in a part of our blood called hemoglobin, which helps our blood to carry oxygen molecules from our lungs to the rest of our bodies.

Our bodies can't produce iron, but it's naturally present in many foods, including meats (beef, pork, turkey), produce (raisins, spinach, prunes) and nuts (walnuts, cashews, peanuts). And it's so important for our bodies to have enough iron that some food makers put a dash of it in other food products—such as fortified breakfast cereal. (Of course it wouldn't be healthy to eat iron on its own, so stick to getting your daily dose via food and vitamins.)

Like many metals, iron is magnetic, so if you have a strong enough magnet, you will be able to pick it up. Will you be able to pick up your box of breakfast cereal just by magnetic force alone? No, because it doesn't contain enough iron for the magnetism to overpower gravity pulling the weight of all that cereal down. But we are going to find a way to remove—or "extract"—the iron from that cereal and pick it up with a magnet.

Materials

- Breakfast cereal that contains iron, such as fortified cornflakes (check the label to see how much iron each serving contains—the more the better!)
- Magnet (as strong as possible)
- White piece of paper
- Resealable zip-top bag

Preparation

- Place a handful of cereal in a Ziplock bag.
- Try passing the magnet over the flakes.

Are they pulled up by the magnet? _____ *Why not?*_____

Procedure

- Crush the cereal in the Ziplock bag. Keep crushing it until it becomes a fine powder (the finer you can get it, the easier it will be to separate out the iron particles).

- Carefully pour the powder onto the white piece of paper in a thin layer.

- Run the magnet closely over the top of the cereal powder.

- As the cereal sticks to the magnet, pinch it off and place it into a separate pile.

- Our scales are not accurate enough to weigh the small amounts of iron so take a picture and create an Explain Everything or Key Note slide that explains your experiment.

Email the Explain Everything or Keynote to me.