

Finding the Iron in Your Cereal

In this fun activity, kids can play with their food while learning about iron, magnetism, nutrition, and even a little math.

What You Need:

- 2-3 flake-type cereals, one of which is fortified with 100% DV (Daily Value) of iron, the other one or two with lesser percentages of iron
- Several magnets
- Several plastic or paper bowls



What You Do:

- Place a handful of each cereal in separate bowls.
- Have kids wave a strong magnet over each bowl of flakes; see if the magnet picks up any flakes.
- Have kids crush the cereal in the bowls into large crumbs with their hands.
- Have kids run the magnet over the cereal crumbs again to see what the magnet picks up this time. They can touch the magnet directly to the crumbs too.
- Ask them to note the difference in what the magnet picks up in the cereal that's fortified with 100% DV of iron compared to the lesser fortified cereal variety(ies).

STEM Concepts Explained

Many breakfast cereals are fortified with food-grade iron particles (metallic iron) as a mineral supplement. Metallic iron is digested in the stomach and eventually absorbed in the small intestine. If all of the iron from your body was extracted, you'd have enough iron to make only two small nails.

Iron is found in a component of blood called hemoglobin, the compound in red blood cells that carries oxygen from your lungs so that it can be utilized by your body. It's the iron in hemoglobin that gives blood its red appearance. A diet deficient in iron can result in fatigue, reduced resistance to diseases, and increased heart and respiratory rates. Food scientists say that a healthy adult requires about 18 mg of iron each day.

Iron is an element with the chemical symbol Fe. Magnets attract iron due to the influence of their magnetic field upon the iron. In most objects, some electrons spin one way and some spin the other way, and they cancel each other out, so most objects are not magnetic. In a chunk of

iron, some electrons also, spin one way and some the other, and most of them cancel each other out. But in iron, there are some extra electrons that can go either way. When you run a magnet over a chunk of iron, those extra electrons all start spinning the way the magnet pulls them, and the chunk of iron becomes a magnet itself.

STEAM Extensions

- During this program, have several items made of iron—and a lump of raw iron ore, if possible—for the kids to see and handle. Have the kids try their magnets on those items!
- Explore the nutrition labels of the cereal boxes with the kids to see what other nutrients they are fortified with. Discuss DVs, and help kids research why and how cereal and other foods are fortified with iron and other nutrients.
- Kids can practice math skills by figuring out DVs if they were to eat half or twice the serving size of their favorite cereal.
- Try this further experiment to test for iron in cereal:
 - Measure 1 cup of cereal (typically a serving size) into a quart-size zipper-lock bag. Fill the bag one-half full with warm water. Carefully seal the bag, leaving an air pocket inside.
 - Mix the cereal and the water by squeezing the bag until the contents become a brown, soupy mixture. Allow the mixture to sit for at least 20 minutes.
 - Make sure the bag is tightly sealed and position it on a flat side in the palm of your hand. Place a strong magnet on top of the bag. Put your other hand on top of the magnet and flip the whole thing over so the magnet is underneath the bag. Slowly move the contents of the bag in a circular motion for 15 or 20 seconds. The idea is to attract any free moving bits of metallic iron in the cereal to the magnet.
 - Use both hands again and flip the bag and magnet over so the magnet is on top. Gently squeeze the bag to lift the magnet a little above the cereal soup. Don't move the magnet just yet. Look closely at the edges of the magnet where it's touching the bag. You should be able to see tiny black specks on the inside of the bag around the edges of the magnet. That's the iron!
 - Keep one end of the magnet touching the bag and move it in little circles. As you do, the iron will gather into a bigger clump and be much easier to see.