SCIENCE FESTIVAL FACILITATOR'S GUIDE

Nails for Breakfast

1. Make sure you have the materials you need.

- Iron-fortified breakfast cereal (look for high iron content in cereals with words like "All Bran" or "Whole Wheat Flakes" or "Whole Grain" in their titles)
- Water
- A blender
- Measuring cup
- Clear plastic cups (one for each student-adult team)
- Strong magnets (one for each team at your station at one time)
- Plastic spoons

2. Watch this video on your smartphone:

https://youtu.be/pRK15XSqtAw

3. Prepare your station.

- Mix two cups of iron-fortified cereal with two cups of water in the blender pitcher. Let it sit for a few minutes until the cereal is soft, then blend to make a smooth consistency.
- Distribute plastic cups, magnets, and spoons, one each per student-adult team.
- Be sure to get the magnets back between sessions!

Questions to ask participants before they start:

- You wouldn't eat nails for breakfast, right?
- Is there any kind of metal that you *do* eat?
- Encourage students to share their ideas for a few minutes. Remember, there are no wrong answers!
- This cereal (show the box) says it's "iron-fortified," and iron is a kind of metal.
- I've mixed it up with some water in a blender. Let's see if we can find the iron!

Instructions:

Please read each set of instructions out loud. Make sure that you direct the correct person to complete each assigned task.

- **Adult**: Pour some of the cereal mix into your plastic cup.

- **Student:** While holding the magnet against the outside of the cup, stir the mix inside the cup gently with the plastic spoon. (Adults can help hold the magnet, if needed.)

- **Both:** Observe for a few minutes. What happens? How about when the magnet is taken away?

How It Works:

Some of the iron in our breakfast cereals is in the form of "raw" elemental iron. The small pieces of elemental iron are attracted to the magnet and gather to form the dark spot you can see on the side of your cup. The longer you stir, the darker the spot. When the magnet is removed, the iron will gradually disperse back into the cereal.

Vocabulary:

Hemoglobin: An iron compound that carries oxygen from the lungs to the rest of the body

Real-World Application:

Oxygen is very important for life. The iron in our blood carries oxygen from the lungs to the rest of the body. That's why having too little iron (called anemia) can cause tiredness, make it easier to get sick, and cause our heart rate and breathing to speed up. Our bodies do not make iron; we have to get it from our diet. We can get iron from lots of different sources: red meat, egg yolks, leafy green vegetables (like spinach) and shellfish (like crabs or shrimp). Iron is also added to certain foods. Cereal makers use elemental iron because it is shelf-stable and doesn't affect the food's flavor. In the stomach, this metallic iron is changed into iron compounds that our bodies can use.