Wolf Creek Public Schools
Creating Success For All Learners

Health in Action Project

Alberta Health Services

Iron for Breakfast

Pillar: Healthy Eating
Division: I
Grade Level: 2
Core Curriculum Connections: Science and Math

I. Rationale:

Your students will have a truly magnetic experience learning about the connection between magnets and their breakfast cereal. This lesson focuses on understanding the magnetic properties of iron while learning about the nutritional benefits of dietary iron found in the foods we eat. Students are challenged to use scientific thinking and tools to discover what is really in their breakfast cereal. To understand magnetism, students experiment and observe which objects are attracted to a magnet to explain the common properties that the objects attracted to a magnet possess. A magnet and magnifying lens are used to gather and observe the iron in the cereal. Incorporating nutrition into the science and math curriculum makes students more aware of healthy living messages and applications in their daily lives. Seeing the iron in cereal is a concrete learning experience students won't soon forget, allowing them to see first-hand the metal they're eating!

II. Activity Objectives:

Students will be able to:

- make concrete connections between nutrition, science, and their daily lives.
- understand the importance of eating foods that contains essential vitamins and minerals, such as iron-fortified cereals.

III. Curriculum Outcomes: Grade 2 Science

Topic C: Magnetism
General Learner Expectations *Students will*: **2–8 Describe the interaction of magnets with other magnets and with common materials.**
Specific Learner Expectations *Students will*: 2. Distinguish materials that are attracted by a magnet from those that are not. 3. Recognize that magnets attract materials with iron or steel in them; and given a variety of metallic and non-metallic objects, predict those that will be attracted by a magnet. 6. Demonstrate that most materials are transparent to the effects of a magnet. A magnetic field will pass through such materials, whereas other materials interact with a magnet.

IV. Materials/Preparation:

- Set up a display of various magnets and magnetic toys for students to explore and experiment with a few days prior to doing the Science Activity so they gain a clear understanding of the magnetic properties of iron
- Ask students to bring in a box of their favourite cereal prior to the activity
- One white magnet for each group of students
- A few white tissues for each group.
- Plastic zipper sandwich bags for the cereal

V. Procedure:

Science Activity: *Students use magnets to extract food-grade iron filings from iron-fortified cereal, discuss the reasons why food manufacturers add iron to food, and review good nutritional practices.*

1. In small groups, have students brainstorm words and ideas related to magnets. Since the word "metal" is usually mentioned, take time to ensure that students understand that magnets are attracted to metals containing iron. (Cobalt and nickel are two other metals that can have magnetic properties.)

2. Engage students by asking them if they would ever eat metal objects such as nails for breakfast.

3. After listening to their comments, direct them to read the ingredients listed on the label of the cereal box that they brought to class. Talk about what iron does for the body and why it is important in a healthy diet, sources of iron, and why some foods may be fortified with iron. Iron:

- is needed by red blood cells to carry oxygen throughout the body
- helps to give us energy
- helps our immune system and keeps us from getting sick easily
- is found in foods like beef, pork, chicken, shellfish, legumes (beans, peas, lentils), nuts, seeds, egg yolks, and some vegetables like spinach, dried fruit, and molasses
- may be added to commonly eaten foods like breakfast cereals to help ensure that people consume adequate levels of iron each day and maintain good health

For more information about iron, please see:

- ~~Alberta Health Services~~

Dietitians of Canada

4. Ask students if they can think of a way to prove that some cereals do contain iron. Have them experiment for a few minutes on their own with a small plastic zipper sandwich bag full of iron-fortified cereal.

5. Divide students into groups and perform the experiment with the students, having them complete each of the following steps in sequence:

6. Give each group one plastic zipper sandwich bag full of iron-fortified cereal (35 g). See Nutrition Facts table from the cereal package to determine the volume equal to 35 grams. Explain to students that 35 grams is one serving from the Grain Products food category from Canada's Food Guide.

7. After making sure the sandwich bag of cereal is closed, have each member of the group take turns crushing the cereal in the bag. Caution students to be careful not to tear holes in the bag as they crush the cereal.

8. Once the cereal is thoroughly crushed, have one student in each group stir the cereal using the white magnet provided. Students may need to hold the magnet in the bag and mash the cereal around the magnet to collect more iron filings.

9. Have the student pull the magnet out of the cereal and use the hand lens to see if they can see small iron filings.

10. Have other members of the group also look at the white magnet to see if any iron is on the magnet. (There should be tiny black dots and slivers. These are the iron filings that cereal manufacturers have added to the cereal. If no black dots or slivers are on the magnet, have the students put the magnet back into the bag and dig around the bottom and in the corners of the bag for the iron.)

6. Use the tissue to wipe the iron filings off the magnet.

7. Have students make a T-chart that list examples of materials that are attracted to a magnet in one column and materials that are not attracted to a magnet in the other column. Discuss the properties of materials that are attracted to magnets (materials with iron and steel). Spend time discussing how a magnet works.

Mathematics Activity:
Students graph the amount of iron in various cereals.

1. Review the purpose of bar graphs. Using large chart paper, create three graphs and label them Fat, Calories, and Iron. Tally the various cereals students brought in. Let students take turns reading the values for fat, calories, and iron from their cereal nutrition labels. Graph (or have a student graph) the values of the five most popular brands by coloring the bars. Ask the following questions:

- Which cereal would you choose if you needed more iron in your diet?
- If you wanted to eat more low-fat foods, which would be a good choice?
- If you wanted to limit calories, what would you pick?
- Do the cereals with the most calories have the most fat?

VII. Assessment Ideas:

- Have students illustrate their learning by drawing a picture of what they observed, listing the types of materials that are attracted to a magnet and why they interact with the magnet, and explaining how a magnet works.