

Lesson Plan for Comprehensible Input: Magnets

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Background

The students have been studying how magnets work and how they are used in daily life. The class is midway through the unit and has an understanding of how magnets work. The students understand that magnets are only attracted to some kinds of metal (e.g., steel, iron) and that magnetic power can pull through paper, glass, and thin wood. They understand the idea of permanent and temporary magnets (e.g., if you rub a steel nail with a magnet, it becomes magnetic). They understand that the Earth is magnetic and that a compass will always point to Earth's North Pole. They have just begun to talk about how magnets were invented and how they are used in real life.

English proficiency level: Intermediate

Grades: 7

Standards: Virginia Standards of Learning. 3.1) Investigation, Reasoning, Logic. 3.3) Objects can be described according to the materials they are made of and their physical properties.

Preparation

Aim: Today we will use magnets to help us compare the amount of iron found in different brands of cereal. We will also check to see if the amount of iron that the manufacturers claim to be in each box is accurate.

Language Objectives: Students will

- Listen to a booklet, Magnet Magic. (Hershell & Bowles, 1998).
- Read nutrition facts on a cereal box.
- Compare results of an experiment orally.
- Write conclusions and present them to the class.

Content Objectives: Students will

- Make a hypothesis.
- Conduct an experiment according to directions.
- Record experiment results in writing and on a graph.

Vocabulary: attract, repel, hypothesis, extract

Materials

Three types of commercial cereal, mixing bowls, experiment directions, graph, plastic rod with magnet attachment, water (enough to mix the cereal until thin and soupy), milligram balance scale

Motivation

Have students copy the objective of the day and new vocabulary words in their journals as soon as they enter the classroom. (This is a routine activity.)

Ask a student to read the objective aloud. Discuss content vocabulary words, such as extract.

Read “Magnet Magic” as warm-up and review. Ask students comprehension and review questions throughout. In some places, ask students to demonstrate their answers using objects in the classroom (e.g., magnets, globes, metal objects). For example, page 5 states, “Magnets have the power to attract some kinds of metal. Question: What kinds of metals do magnets attract? (The student who answers will be asked to identify something in the classroom that is made of steel and something that is made of iron.) On page 9, the question can be asked: “What is the rule of magnetism?” (A student will use two magnets to demonstrate how they attract and repel.) Conclude by asking students, “Have you ever thought of using magnets to find the amount of iron in your cereal? How could we do this?”

Presentation

Model science experiment (Whelmer #7, Iron in Cereal, www.mcrel.org) and show samples of the iron that came from the cereal so that students will know what they are to look for. Distribute the worksheet with the steps for the experiment and explain. Indicate where they should record their findings and write their conclusions.

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Practice

Have the groups begin the experiment, following the steps. Circulate among the groups to make sure everyone knows what to do.

Step 1. Each group will read nutrition information on the cereal box, discuss, and formulate and write a hypothesis (e.g., There will be less than 100 milligrams of iron in the Brand X cereal.).

Step 2. Empty entire contents of cereal box into the mixing bowl.

Step 3. Use hands to crush the flakes to as small a size as possible.

Step 4. Add water and stir with a spoon. Keep adding water until the mixture is thin and soupy. Stir for about 15–20 minutes to be sure all the iron is extracted.

Step 5. Stir with the magnet rod to attract the iron particles and place particles on paper towel.

Step 6. Rinse iron particles to remove any cereal that might be clinging to them. Let dry for two minutes.

Step 7. While the iron is drying, read the nutrition information again to determine the number of servings of cereal in the box. Weigh all the iron collected and divide the amount by the number of servings to determine iron content per serving (e.g., 120 milligrams of iron/6 = 20 milligrams per serving).

Step 8. Record results on worksheet. Compare with cereal box information.

Step 9. Write conclusion as a group.

Application

When the experiment is completed, have each group present its results and record them on a chart on the board. Have students graph the results individually by cereal brand. Discuss.

Assessment

Review what has been learned with the students. Ask them to write a conclusion based on the comparison of the three cereals. “What can we conclude about the manufacturers’ claims of the amount of iron in each box of cereal?” Review at the end of the lesson or the next day.

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