

Magnets Grade 4 Evaluation

Teacher Section

Overview Kids will demonstrate how well they understand important key concepts from this section.

Suggested Time 45-60 minutes

Objectives Students will be tested on the key concepts of magnetism:

1. All magnets have two poles. Magnets are called dipolar, which means they have two poles. The two poles of a magnet are called north and south poles. The magnetic field comes from a north pole and goes to a south pole. Opposite poles will attract one another. Like poles will repel one another.
2. A magnetic field is an area around a magnet that will create a force on another magnet that comes within reach of the magnetic field. In fields, the closer something gets to the source of the field, the stronger the force of the field gets. This is called the inverse square law.
3. The Earth has a huge magnetic field. The Earth has a weak magnetic force. The magnetic field comes from the moving electrons in the currents of the Earth's molten core. The Earth has a north and a south magnetic pole which is different from the geographic north and south pole.
4. Compasses turn with the force of the magnetic field.
5. Iron and a few other types of atoms will turn to align themselves with the magnetic field.

Students will also demonstrate these principles:

6. Design and build a simple compass and use it to detect magnetic effects, including Earth's magnetic field.
7. Design and build experiments that demonstrate the principles above.
8. Know how to demonstrate that magnets attract or repel each other.

Materials (one set for entire class)

- Needle
- Foam
- 2 different kinds of magnets (round or square, N-S pole locations different, etc.)
- Cup of water
- Paperclip
- Penny
- Quarter

Lab Preparation

1. Print out copies of the student worksheets, lab practical, and quiz.
2. Have a tub of the materials in front of you at your desk. Kids will come up when called and demonstrate their knowledge using these materials.

Lesson

The students are taking two tests today: the quiz and the lab practical. The quiz takes about 20 minutes, and you'll find the answer key to make it easy to grade.

Lab Practical

Students will demonstrate individually that they know magnetic objects attract or repel each other. While other kids are waiting for their turn, they have a choice of three different homework assignments to get started on. You choose whether they get to work together or individually.

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Student Worksheet

Overview: Today you're going to take two different tests: the quiz and the lab practical. You're going to take the written quiz first, and the lab practical at the end of this test. The lab practical isn't a paper test – it's where you get to show your teacher that you know how to do something.

Lab Test & Homework

1. Your teacher will call you up so you can share how much you understand about magnets and how they interact with each other. Since science is so much more than just reading a book or circling the right answer, this is an important part of the test to find out what you really understand.
2. While you are waiting for your turn to show your teacher how much of this stuff you already know, you get to choose which homework assignment you want to complete. The assignment is due tomorrow, and half the credit is for creativity and the other half is for content, so really let your imagination fly as you work through it. Choose one:
 - a. Write a short story or skit about magnetism from the perspective of the electron or the magnet itself. You'll read this aloud to your class.
 - b. Make a poster that teaches the main concepts to magnetism. When you're finished, you'll use it to teach a class in the younger grades and demonstrate each of the principles that you've learned.
 - c. Write and perform a poem or song about magnetism. This will be performed to your class.