



Magnetic Pictures

<p>THE BASICS</p>	<p>THE TOOLBOX</p>	<p>EDUCATION STANDARDS</p>	<p>Physical Science Content Standard: Exploring properties of magnetic fields and learning to visualize how lines of forces look in a magnetic field.</p>
<p> Grade Level: K-6</p>	<ul style="list-style-type: none"> • 8.5 x 11" construction paper (dark) • Bar magnets • Assorted doughnut & horseshoe magnets 	<p>SAFETY CONCERNS</p>	<p>Make sure young students do not put iron filings in their mouths or rub their eyes after touching filings.</p>
<p> Estimated Time: 30 min.</p>	<ul style="list-style-type: none"> • Iron filings • 8.5 x 11" white paper • Fine-mist spray bottle of water • Newspaper 	<p>FOR KIDS WITH DISABILITIES</p>	<p>Students with mobility impairments may need to work with a partner. Visually-impaired students may need to manipulate alternative models of the magnetic field.</p>



Educational Objective:

To give students a permanent picture of how the lines of force look in a magnetic field. These pictures provide a two-dimensional view, but students should be challenged to think of magnetic fields in three dimensions.

Questions to Ask Students As They Do This Activity:

- Describe what is in your picture. What does your picture show?
- Why did the iron filings line up the way they did?
- If you made another picture, would it look exactly the same? Would it look similar? Why?
- How would your picture look if you used a magnet with a different shape?

Why It Happens:

Read the "Why It Happens" section of *Exploring Magnetic Fields* on page 56. For the pictures made with filings and water, the color on the paper is ferric oxide or rust. This chemical results when the water and the oxygen in the air react with the iron in the filings. Since the water also touches the paper, some of the rust is washed onto the paper and dries there.

WEB SITES

- **Magnetic Lines of Force**
http://www.exploratorium.edu/snacks/magnetic_lines.html (Grades 2-6)
- **Fun With Feelings – Magnets**
<http://www.teachnet.com/lesson/misc/feelmag042099.html> (Grades K-6)

SOFTWARE

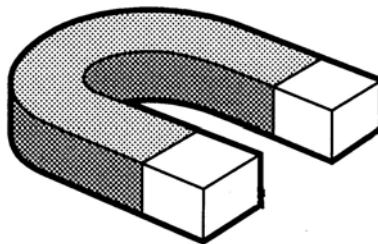
- **STV: Electricity and Simple Machines**
National Geographic Society, 1995.
(Grades 4-7)
- **Ozzie's Science**
Digital Impact, 1996.
(Grades K-4)

READING ROOM

- Davies, Kay, and Wendy Oldfield. **Electricity and Magnetism.** Steck-Vaughn, 1992. (Grades 3-6)
- Gardner, Robert. **Science Projects about Electricity and Magnets.** Enslow, 1994. (Grades 5-12)
- Fowler, Allan. **What Magnets Can Do.** Children's Press, 1995. (Grades 1-2)

Career Connections

A powder metallurgist (metallurgy) specializes in producing powdered metals or metallic objects by compressing a powdered metal or alloy, with or without other materials, and heating thoroughly without melting to solidify and strengthen the original material.



MAGNETIC PICTURES ACTIVITY SHEET

The magnetic fields we looked at in the last activity, Exploring Magnetic Fields, were invisible until we used tiny iron filings to show that they were really there. Today we will make a picture of a magnetic field that you can take home with you. Once you start this activity, you cannot move your picture until it dries. Be sure to listen to your leader so you know how to set up your picture.

1. Lay down a sheet of newspaper.
2. Next lay your magnet in the middle of the sheet of newspaper.
3. Lay a sheet of white paper on top of the magnet so the magnet is just under the middle of the paper.
4. Sprinkle a very thin layer of iron filings on the paper. If you get too many, you will hide the magnetic field.
5. With help from your leader, spray a fine mist of water over your picture. What do you think will happen to the iron filings after they get wet?
6. **Do not touch your picture until tomorrow!** After your picture is dry, your leader will tell you how to remove the iron filings without spilling them.
7. When you take your picture home, see if you can tell your Mom, Dad, or a friend about magnetic fields and how you made your magnetic picture!

