

**DO ~~DO~~'T TRY THIS
AT HOME!**

Marvellous Magnets

Discover how magnets work with these “attractive” experiments.

Turn your house into a laboratory to examine the invisible forces of magnets, make your own compass, find out how to magnetize metals and discover which materials are magnetic.



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AMAZING EXPERIMENTS!

Is It Magnetic?

Test various materials to discover which ones are attracted by magnets and make your very own temporary magnet.

Materials

- A magnet
- A metal screwdriver
- 2 to 3 metal paperclips
- An aluminum can
- A plastic spoon
- Assorted coins

Let's get to work!

Find out which objects are attracted by magnets.

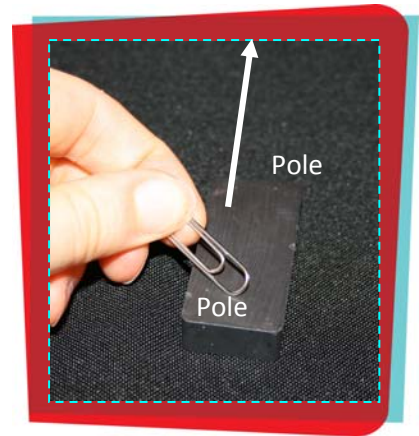
1. Take your magnet and place it against the screwdriver, paperclip, aluminum can, plastic spoon and coins. What happens? Are all of the objects attracted by the magnet? Which ones are not?

Make your own magnet.

1. Quickly drag a metal paperclip on one of the sides of the magnet, towards one end (called a "pole"). Make sure you do this without touching the other end.
2. Repeat step 1 approximately 50 times.
3. Bring the paperclip close to another paperclip. What happens?
4. The newly magnetised paperclip should push or pull on the non-magnetised one. If nothing happens, repeat steps 1 and 2.
5. Use your magnetised paperclip to try to attract the other objects.

TAKE NOTE!

Keep magnets away from banking cards and electronic devices such as televisions, phones or computers.



What happened?

Objects containing iron, nickel or cobalt can be attracted by magnets. Such metals can also be transformed into temporary magnets by either being near or rubbed against an existing magnet.

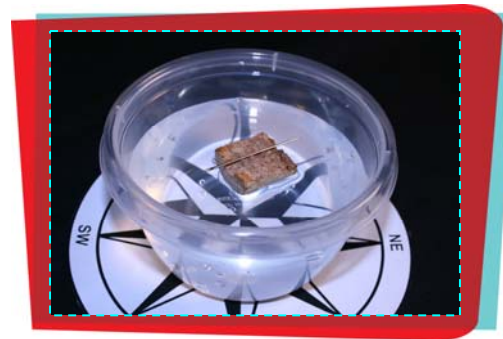


Make a Compass

A compass is a tool that contains a small magnet. It points towards the Earth's north magnetic pole. Compasses help us navigate and find directions. Try the experiment below to make your very own compass.

Materials

- 1 cork
- 1 clear plastic container
- water
- 1 magnet
- 1 metal paperclip, needle or small metal cylindrical object
- Scissors
- A printed copy of the compass rose template (found on the next page)



Let's get to work!

1. Print out the compass rose template.
2. Fill the plastic container with water and place it in the middle of the compass rose.
3. To magnetize the needle, rub the magnet along the needle at least 50 times, always in the same direction, from the eye to the tip.
4. Cut the cork in half lengthwise with the scissors. Ask an adult for help with this step, corks can be hard to cut.
5. Using the scissors, carefully scrape out a notch lengthwise down the centre of the cork.
6. Place the cork on the water, with the cut edge facing up.
7. Carefully place the magnetized needle into the notch made in the cork.

Once your compass is built, one end of the needle should point north (ask an adult to verify this using a map or a compass). Rotate the compass rose under the container so that the tip of the needle aligns with the north arrow of the compass rose. Keep your compass away from other magnetic fields, such as electrical cords, other magnets or metallic objects.

What happened?

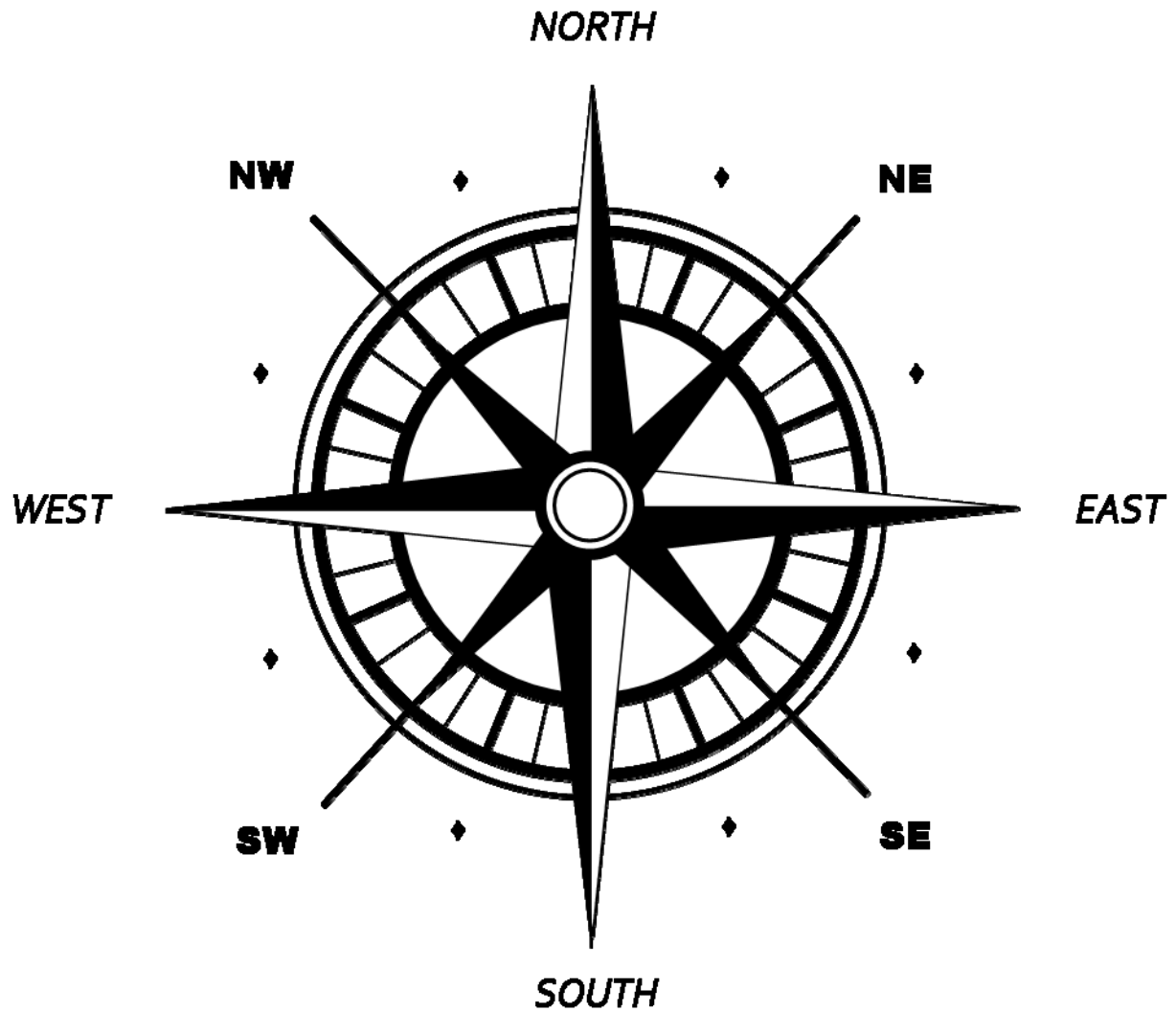
Magnets have a north pole and a south pole. When two magnets are brought close to one another, the north poles of each magnet will push away from each other (they will repel). The same will happen with the two south poles. However, opposite poles will attract. This means that the north pole of one magnet will seek out the south pole of the other.

The Earth is actually a very big magnet and its magnetic north pole will attract the south pole of a magnetized needle in a compass. This is how a compass is able to indicate the direction of the magnetic north pole from anywhere on Earth.



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Magnet Maze

In this experiment, you will use magnetic force to move objects without touching them.

Materials

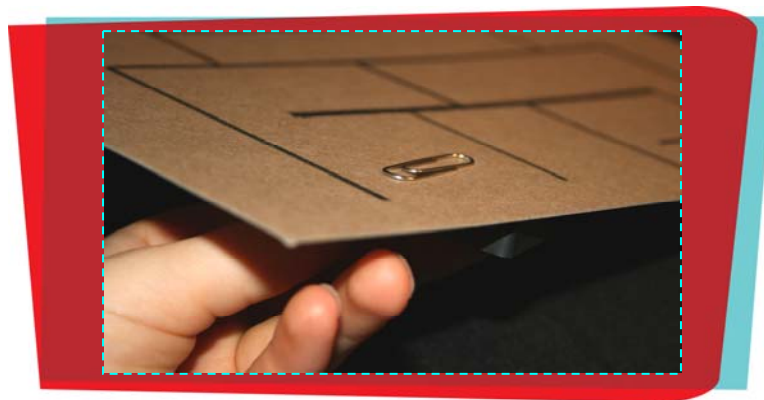
- A magnet
- A metal paperclip or other small magnetic object
- A piece of Bristol board or cardboard
- Markers
- A ruler

Let's get to work!

1. Use the ruler and marker to draw a maze on your Bristol board. Make sure the maze passages are large enough for your paperclip to fit through them.
2. Place the paperclip at the start of the maze and carefully hold the maze in your hand.
3. With your other hand, hold the magnet underneath the paperclip, on the underside of the Bristol board. If your magnet is strong enough, it will be able to attract the paperclip through the Bristol board.
4. Use the magnet to guide the paperclip through the maze to the finish and challenge your friends to solve the maze.

What happened?

Magnets are objects that are capable of attracting and repelling other metallic objects. This invisible magnetic force can be felt through certain materials. In this case, the magnet was able to move the paperclip through the Bristol board.



Magnetic Kite

The force of a magnet can sometimes be stronger than the force of gravity. In this experiment, you will make a paperclip fly using the laws of physics.

Materials

- A very strong magnet
- A metal paperclip
- 30 cm of string
- A heavy object such as a roll of tape, table or chair

Let's get to work!

1. Tie one end of your piece of string to the paperclip and the other end to your heavy object.
2. Move the paperclip as far away from the heavy object as the string will allow.
3. Slowly bring the magnet towards the paperclip. As the magnet gets closer, the paperclip will be attracted by it. The paperclip will move with the magnet even though the two never touch.
4. Keeping the magnet close to the paperclip, slowly move the magnet up and down, side to side. How far away can you move the magnet from the paperclip before it falls?



What happened?

The magnet's magnetic force attracts the paperclip. Magnets can act across a distance, so your magnet does not have to touch the paperclip in order to attract it. The magnetic field acting between the two objects is invisible which is why it looks like the paperclip is flying through the air all on its own, just like a kite.



Gone Fishing

Use what you know about magnets to create a fun game for you and your friends.

Materials

- 2 – 3 sheets of paper
- Metal paperclips
- 30 cm of string
- A small magnet (see picture below for approximate size)
- A pencil or stick
- A small plastic container
- Markers
- Scissors

Let's get to work!



1. Using your pencil and markers, draw several fishes on the sheets of paper. You can make your fishes as big or as small as you want as long as they are bigger than a paperclip and smaller than your plastic container.
2. Use the scissors to cut out each fish.
3. Take your paperclips and clip one on each of the fish's mouths.
4. Put all your fishes into the fish pond (your empty container).
5. To make your fishing rod, tie one end of the string to the magnet and the other end to the pencil or stick. Make sure it's tied well so it won't fall off.

6. Using the fishing rod, lower the magnet into the container and try to catch as many fishes as you can.

Challenge!

Make four different "types" of fishes using a different colour or shape for each "type". Make four magnetic fishing rods and give each one to a friend - be sure to keep one for yourself. Ask each friend to pick a "type" of fish and then go fishing. The first one to catch all four of their fishes wins.

DID YOU KNOW ?

Magnets are used in a lot of games to keep pieces in place temporarily. There are even travel games with magnetic pieces.





For the Experiments

- metal paperclips
- a magnet
- a metal screwdriver
- an aluminum can
- a plastic spoon
- assorted coins
- a cork
- a container of water
- a metal needle or small metal cylindrical object
- scissors
- markers
- Bristol board
- a heavy object (roll of tape, table or chair)
- paper
- 30 cm of string
- a small magnet
- a pencil or stick
- a small plastic container



Book

The Magic School Bus and the Electrical Field Trip
(Scholastic Canada, Limited, 1997)

Web Link

Background Information on Magnets
<http://cstmuseum.techno-science.ca/en/education/tell-me-about-background-information-for-magnets.php>

