HOMEMADE MAGNET

You can make your own magnets from needles and paper clips. Then you can test them by seeing if they attract and repel one another (see the project on pages 10-11). Magnets made from iron slowly lose their magnetic effect over time. Magnets made from steel are permanent magnets.

WHAT YOU NEED
Needle
Paper clip
Shallow dish
Polystyrene
Magnet

MAKING A MAGNET

WHY IT WORKS
Magnets push and pull each other because unlike poles attract one another and like poles repel one another. This attraction and repulsion is strong enough to move the polystyrene boat through the water. When the north pole of the needle is brought close to the north pole of the paper clip, the paper clip is pushed away. This force is so strong it is sometimes almost impossible to push two magnets together.

1. Stroke one end of a paper clip with the south pole of a magnet, at least twenty times. Always stroke the paper clip in the same direction, and lift it well clear at the end to start a new stroke. This end will be the north pole of the paper clip.

2. Tape the paper clip to a piece of polystyrene shaped like a boat with the north pole pointing towards the front. Float it in a shallow dish of water.

3. Stroke the eye of the needle with the north pole of the magnet. This magnetises the needle, making the eye the south pole of the needle and the point the north pole.

4. Bring the eye of the needle near the end of the paper clip. The front of the boat turns towards the needle.

5. Turn the needle around and bring its point near the end of the paper clip. The boat turns away from the needle.

BOUNCING MAGNETS

Place a piece of wood between two magnets with like poles on top of each other. Tape the magnets together and remove the wood. The two magnets repel each other, but the tape keeps them in place. Press down on the top magnet and see it spring back or twist because of the repulsion. This is how a Maglev (magnetic levitation) train works (see page 31).