Seeing how a magnet works

Tiny pieces of iron and steel can be used to show where a magnet is working.

This page and the next page show demonstrations that allow you to see the effects of the invisible power of a magnet.

Floating on air

If you tie a paperclip to a thread and then hold it close to a magnet, the paperclip will tug on the thread as it is pulled by the magnet.

If you move the magnet away from the paperclip, the paperclip will follow and seem to float in the air.

Make patterns of iron

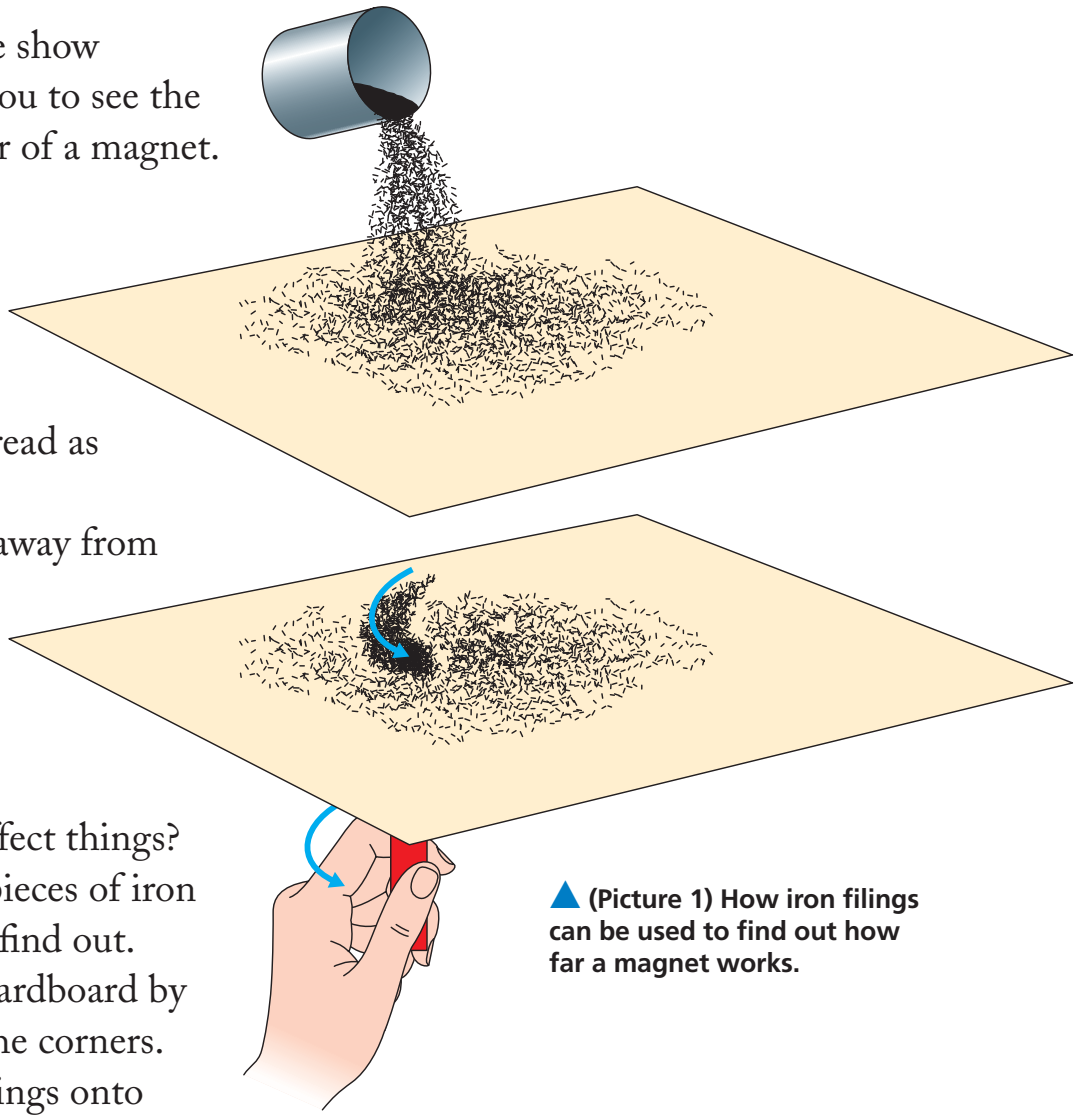
How far does magnetism affect things? If you have some very fine pieces of iron (called iron filings) you can find out.

Support a thin sheet of cardboard by placing books underneath the corners.

Now sprinkle the iron filings onto the cardboard so that they make a thin, even coating (Picture 1).

Bring the magnet under the cardboard and move it around the underside. The filings will follow as if by magic, making swirling patterns.

When the filings get clumped up, take the magnet away, shake the cardboard to spread the filings out and try again.



▲ **(Picture 1) How iron filings can be used to find out how far a magnet works.**

See the powerful ends of a magnet

This time, place a bar magnet on a table and place the cardboard on top of the magnet (Picture 2). Make sure the cardboard stays level. Now slowly sprinkle iron filings on the cardboard. Some of them will move about and form trails. Gently tap one corner of the cardboard

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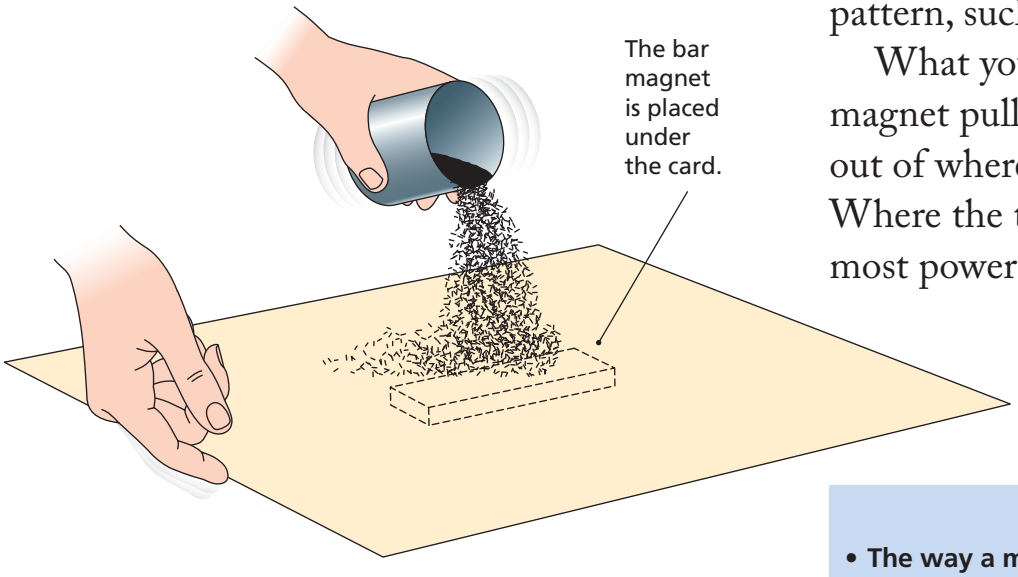
▼ (Picture 2) Tracing patterns of a bar magnet.



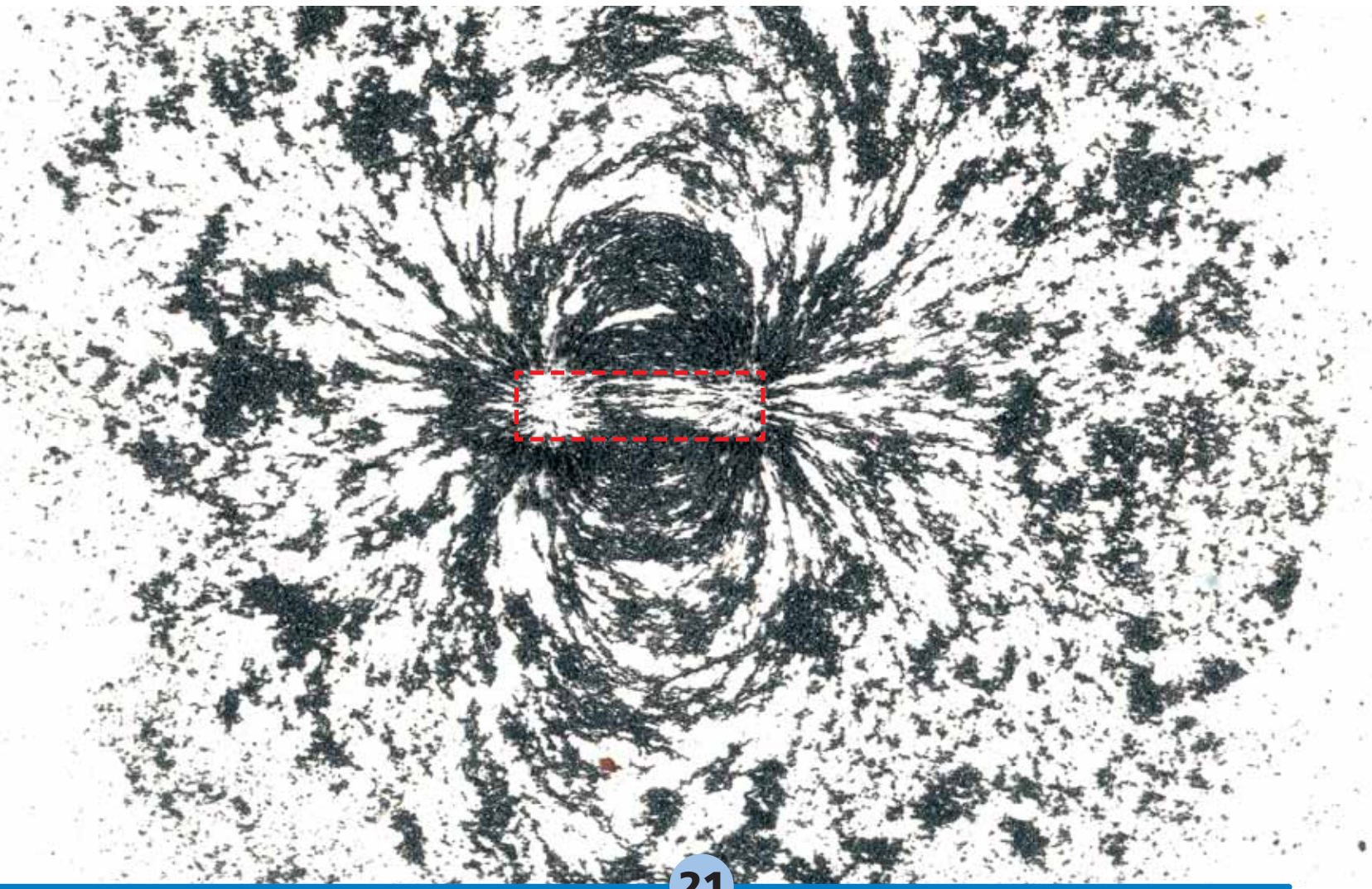
and the filings will line up into a pattern, such as the one in Picture 3.

What you are seeing is the way the magnet pulls. See how trails go in and out of where the ends of the magnet are. Where the trails go in and out are the most powerful parts of the magnet.

Summary

- The way a magnet pulls at things around it can be seen using iron filings.
- The most powerful parts of the magnet are at the ends.

▼ (Picture 3) The iron filings in this picture are tracing the pattern of forces surrounding a bar magnet (the red rectangle).



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