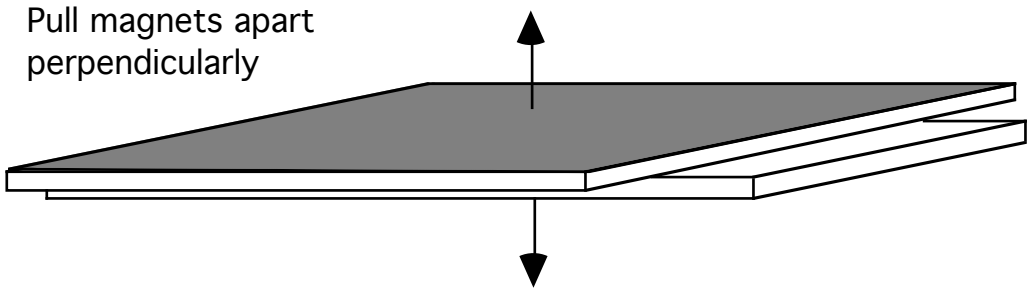
Refrigerator Magnets

Equipment:

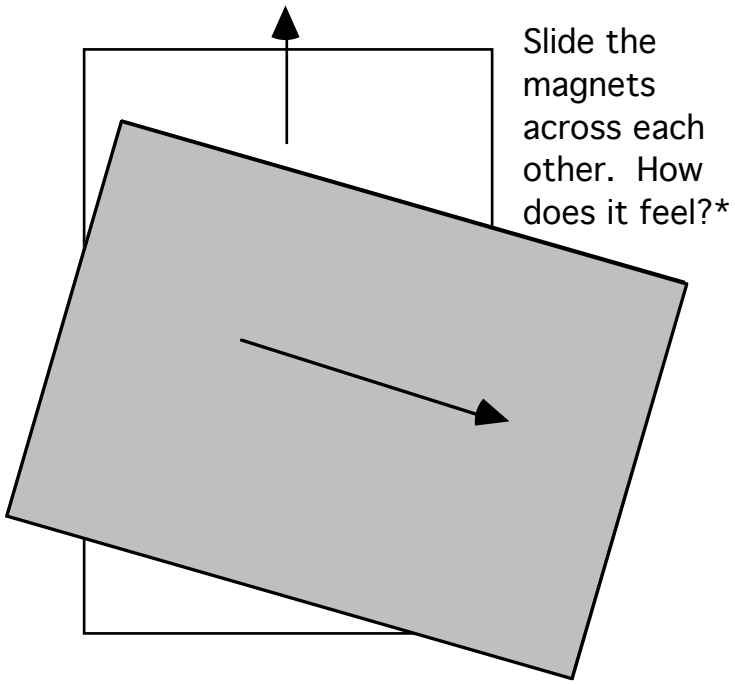
Two flat flexible refrigerator magnets
Iron filings

To do and notice:

a) Lay the two magnets on top of each other, any side-up and in any direction pull them apart perpendicularly. Experiment with different sides and different directions. Try to figure out which arrangement results in the strongest and weakest attraction and repulsion.



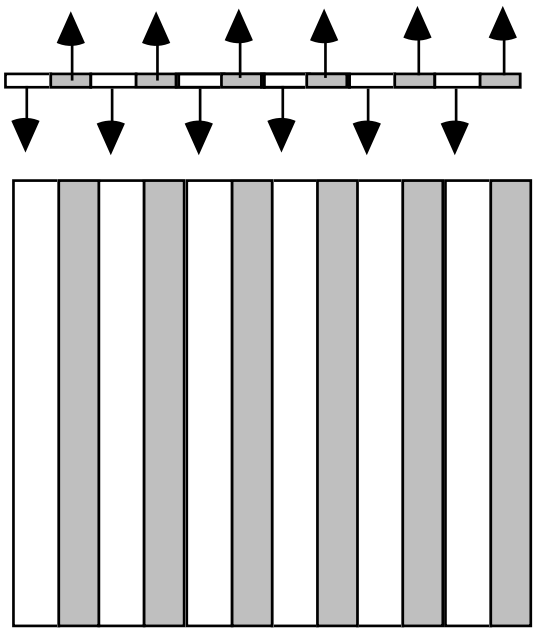
b) Next, pull apart the magnets, but this time slide them across each other. Again, experiment and try various arrangements. You might find that the two magnets vibrate as you pull them apart in a specific way.



c) Finally lay one magnet, dark side-up on a table. Sprinkle iron filing on top of the magnet. Remove excess iron and look for a pattern.

What's going on?

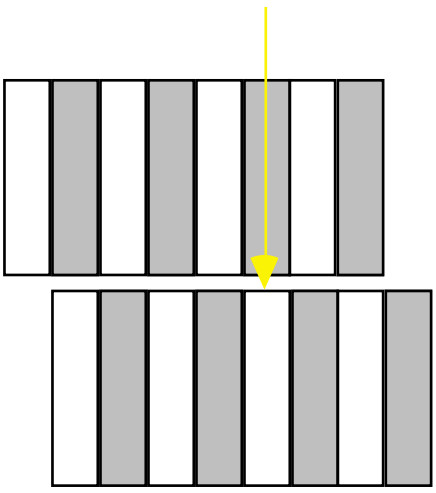
a) The diagrams below show a side and bottom view of an enlarged refrigerator magnet.



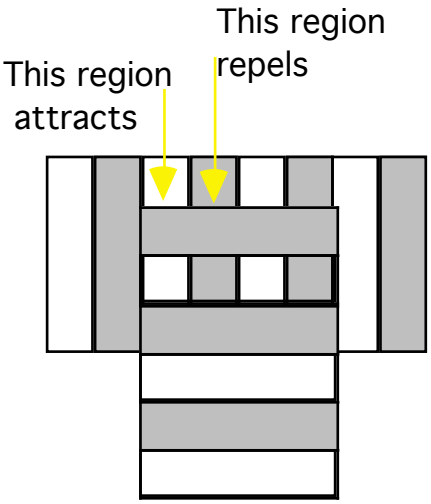
The arrows show the poles of each magnet.

These flat flexible magnets are made with alternating strips of magnetic material.

The following two pictures show the strongest and weakest arrangements of magnets.

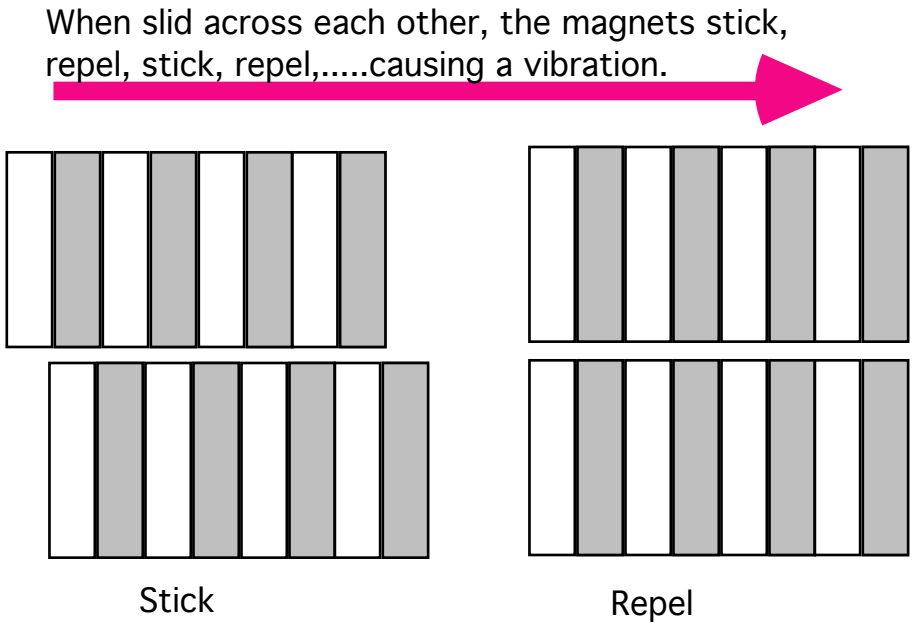


Stongest arrangement



Weakest arrangement

b) The vibration occurs when the magnets are slid apart while the strips are held parallel. During a fraction of a second the magnets are attracted to each other, a split second later, they are repelled. This jerking motion feels like your magnets are vibrating.



c) The thin magnetic strips contain both north and south poles. This causes the sprinkled iron filings to form parallel ridges on the magnet's surface.