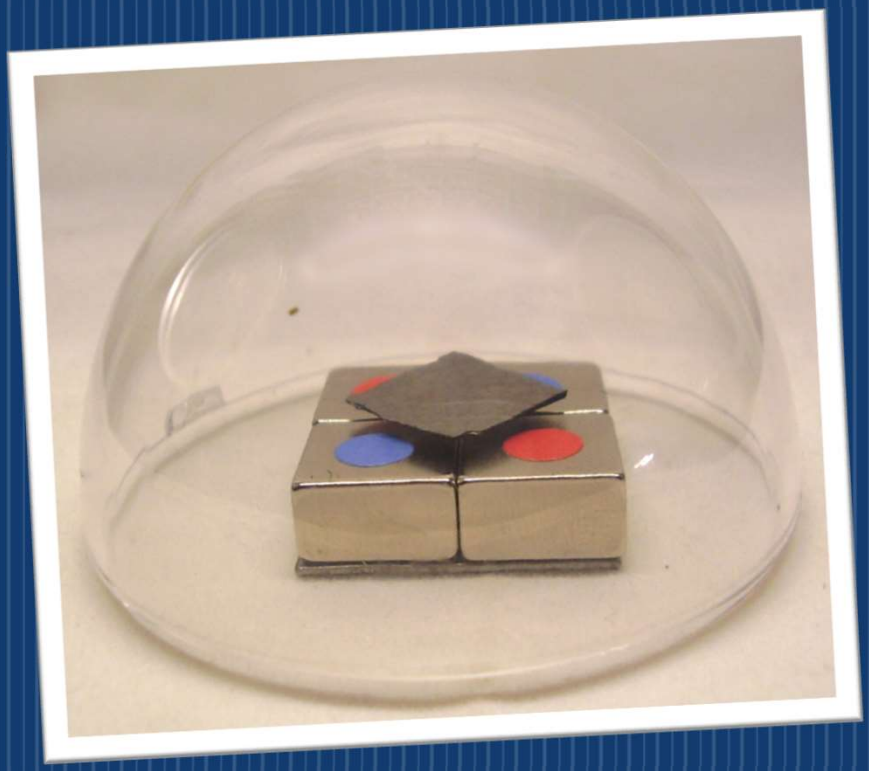
GRAPHITE LEVITATION



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Caution

The materials in this kit are not intended for unsupervised use by children. See additional safety instructions below.

Neodymium Magnet Safety

The neodymium magnets we sell are extremely strong, and must be handled with care to avoid personal injury and damage to the magnets. Fingers and other body parts can get severely pinched between two attracting magnets. Neodymium magnets are brittle, and can peel, crack or shatter if allowed to slam together. Eye protection should be worn when handling these magnets, because shattering magnets can launch pieces at great speeds.

The strong magnetic fields of neodymium magnets can also damage magnetic media such as floppy disks, credit cards, magnetic I.D. cards, cassette tapes, video tapes or other such devices. They can also damage televisions, VCRs, computer monitors and other CRT displays. Never place neodymium magnets near electronic appliances.

- Children should not be allowed to handle neodymium magnets as they can be dangerous. Small magnets pose a choking hazard and should never be swallowed or inserted into any part of the body.
- Never allow neodymium magnets near a person with a pacemaker or similar medical aid. The strong magnetic fields of the magnet can affect the operation of such devices.
- Neodymium magnets are brittle and prone to chipping and cracking. They do not take kindly to machining.
- Neodymium magnets will lose their magnetic properties if heated above 175° F (80° C).
- Neodymium magnets should never be burned, as burning them will create toxic fumes.
- Like any tool or toy, neodymium magnets can be fun and useful, but must always be treated with care.

Graphite Levitation

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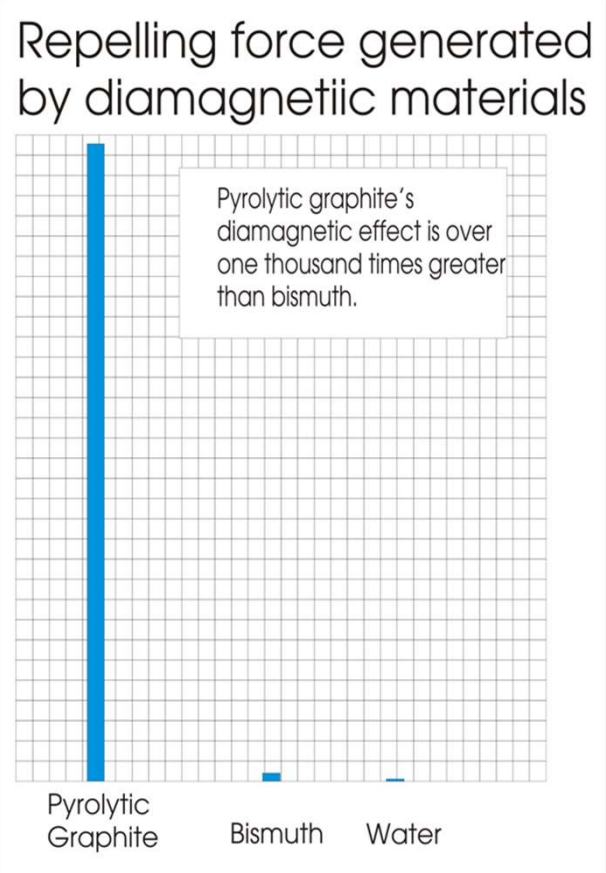
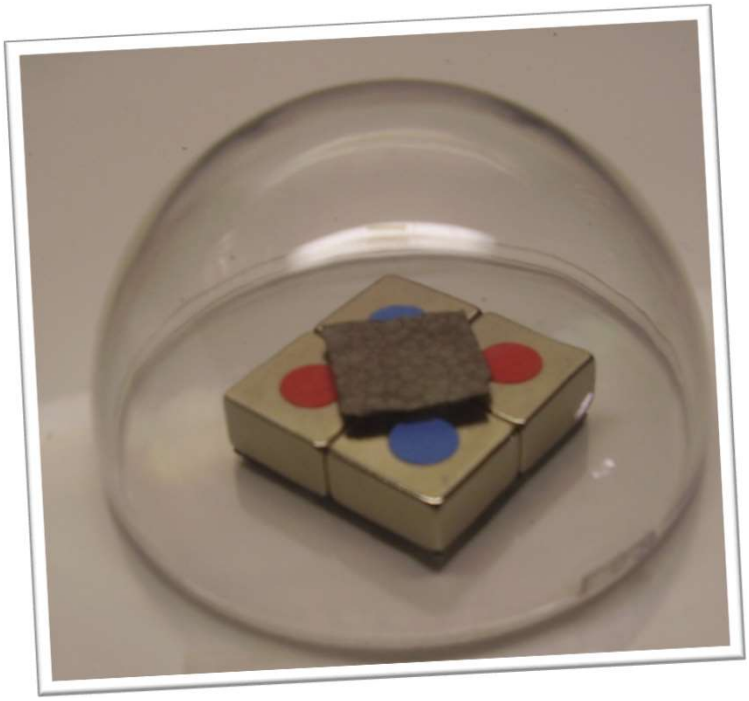
Magnets affect materials in one of three ways, attraction, non-attraction (neutral) and repulsion. Diamagnetism refers to an objects weak repulsion from an magnetic field. There are no poles connected with diamagnetism. The north pole of a magnet repels the material just as well as the south pole. Just like a north pole of a magnet will attract iron just as well as the south pole.

Graphite is diamagnetic. Pyrolytic graphite is 10000X more diamagnet than most common diamagnetic materials such as water. Thin slices of pyrolytic graphite are extremely light and can be made to levitate above a magnetic field.

The closest thing to a perfect diamagnetic material is a superconductor, however superconductors still require liquid nitrogen to become superconductive. Whereas pyrolytic graphite can levitate at room temperature.





Levitation is achieved by alternating poles to create a strong magnetic field gradient. Because diamagnetic materials are repelled by either pole, we can place the magnets with alternating north and south poles, that stick to one another and create a magnetic gradient that centers the pyrolytic graphite material. The magnets are position on a thin piece of sheet steel to keep them in place

The four opposing magnets here are but one possible configuration.

The graphite will levitate on the magnets. A small transparent dome is placed on top to protect the graphite from being blown off the magnets.

More on Pyrolytic Graphite:
Pyrolytic Graphite is a synthetic material that is similar to graphite. It is produced by the decomposition of a hydrocarbon gas at very high temperature in a vacuum furnace. This process permits the graphite to crystallize (pyrolysis) into a layer by layer composition. Pyrolytic graphite have a single cleavage plane, similar to mica. Pyrolytic graphite exhibits the greatest diamagnetism of any room temperature solid (by weight) making it possible to levitate thin slices over rare earth magnets.