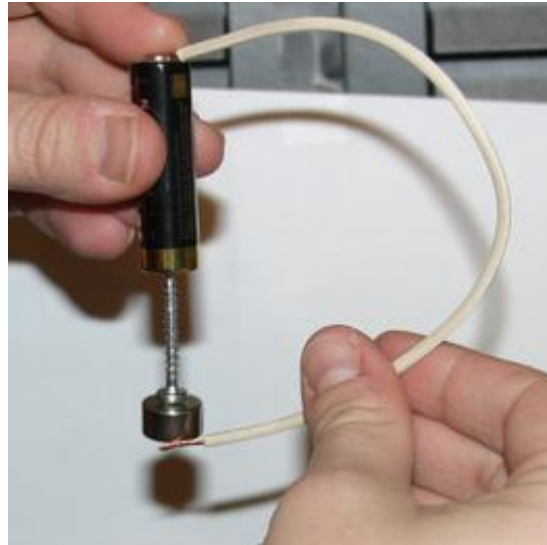


Application No. 1: The Simplest Electric Motor in the World

Author: supermagnete, Germany

Four simple objects make a small motor

An experiment was reported in the magazine **Physik in unserer Zeit** in November 2004 that totally amazed everyone at supermagnete.de. Just when we were coming to terms with our fascination for our own magnets we learned that, with one of our magnets and only 3 additional elements, it would be possible to build a small electric motor... virtually unbelievable. A mere 5 minutes later we had re-created the motor and could not stop ourselves from spinning the magnets. An incredible phenomenon!



We certainly would not like to deprive you of this experience and have received permission from Wiley-VCH Verlag in Weinheim to publish the article (in german) on our website.

From the magazine "Physik in unserer Zeit", 35th year, Issue no. 6, November 2004, © 2004 Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim.



pdf file, 290 kB

Required material:

- one iron screw
- one alkali battery
- one piece bared copper cord
- one disc magnet (www.supermagnete.de/eng/S-15-08-N) of your choice (detailed information below)

Assembly:

- Connect the head of the screw with the disc magnet
- Connect the tip of the screw with the negative pole (lower side) of the battery.
- With the index finger, press the one bared side of the cord onto the positive pole (see photo below).
- Grab the cord with the other hand and touch the magnet with the free end of the cord on the outer side

Suitable Magnets

You will certainly be interested in knowing, which of our magnets are suitable for this experiment. We might as well come to the point: The magnets shown in the article are not our products. No matter. We have been able to achieve the same results with nearly all of our Disc Magnets. It worked the best when we used a magnet with a diameter of at least 8 mm and a height of at least 3 mm. It definitely is more fun to do this experiment with the larger magnets than with smaller ones. If you already own one of our disc magnets, give it a try. There's a good chance that you will be able to get the magnet rotating with the apparatus.

In this photo we used the S-15-08-N (www.supermagnete.de/eng/S-15-08-N) magnet.

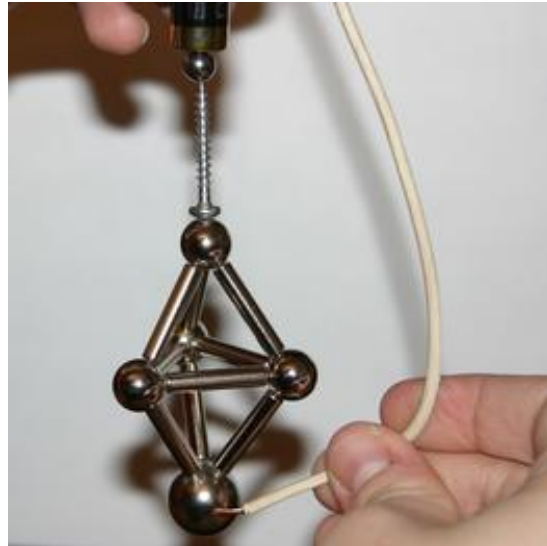


The experiment also works with the Rod- and Sphere Magnets. We found it especially impressive when - as in this photo - our largest Sphere K-19-C (www.supermagnete.de/eng/K-19-C) began to rotate.



For Advanced Users

Endless variations are possible. Here again, a sphere K-19-C (www.supermagnete.de/eng/K-19-C) is brought into rotation. This is accomplished with a double tetrahedron made of connected rod magnets and steel spheres that rotates at an amazing speed.



Tips and Tricks

- **You can't get the magnet to rotate?** The most important thing, naturally, is that the circuit is closed. Make sure that the tip of the screw is in direct contact with the underside of the battery. During your first attempts, use larger magnets - success is usually easier to achieve with these.
- **The screw wobbles?** You have probably used a screw with a crooked tip. File the tip until it is straight or try another screw.
- **My rotating sculpture is too heavy; the magnetic pull is not strong enough to hold onto the battery.** Connect the battery and screw with a small sphere magnet, for example the K-08-C (www.supermagnete.de/eng/K-08-C) (shown in the last photo above).
- **Tip for the lesson [from our customer Michael Sexauer]:** "It's particularly impressive, and also visible to those students sitting in the back row, when a paper pinwheel is attached to the magnets. You get an instant fan!"

You can see another easy-to-build motor among the pictures of our disc magnet S-15-08-N (www.supermagnete.de/eng/S-15-08-N).

Articles used

1 x S-15-08-N (www.supermagnete.de/eng/S-15-08-N)

1 x K-19-C (www.supermagnete.de/eng/K-19-C)

1 x K-08-C (www.supermagnete.de/eng/K-08-C)

Online since: 11/11/2007

Have you found an interesting use for our super magnets? Send us a description! If we publish it on our website, you will receive a **supermagnete voucher with a value of EUR 30**. Further Information: www.supermagnete.de/eng/project_terms.php

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