

## Application No. 142: Magnetic pendulum

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### An extremely fidgety pendulum - no match for nervous people!



### Principle

A magnet is hanging over an iron plate, which holds other magnets. The magnets on the iron plate either repel or attract the hanging magnet. If the hanging magnet is aligned with its north pole on the bottom and the magnets on the plate with their north poles on top, they will repel each other. If you turn the magnets on the plate around and their south poles are on top, they will attract the hanging magnet.

Depending on the pattern of the magnets on the plate, the pendulum will perform many fun and surprising movements. If you use several magnets you can influence the path of the pendulum.

### Assembly

You can easily make your own magnetic pendulum. I used a wooden board and cut it in the shape of a kite. I drilled a hole in the back corner and put a stick in it. Then I attached a ring magnet ([www.supermagnete.de/eng/R-10-04-05-N](http://www.supermagnete.de/eng/R-10-04-05-N)) to the end of a thin rod and used rope to fasten the pendulum to the stick. Finally, I painted everything black and glued a thin metal plate on top of it.

Below three possible arrangements of magnets and the resulting pendulum movements. The videos show how unpredictable the spinner is.

Example 1: Rays. The pendulum follows the empty lanes between the magnet rows.



Video, 780 kB

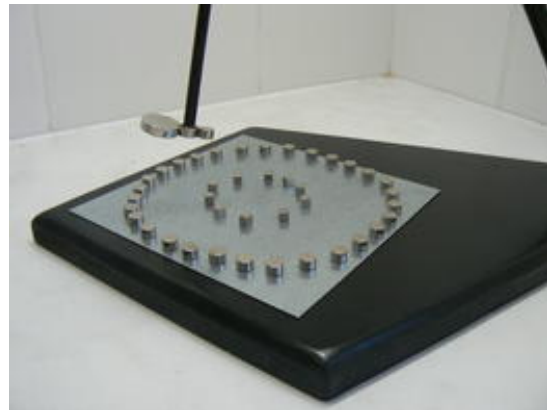
Example 2: Square arrangement





Video, 870 kB

Example 3: I totally changed the arrangement once more and the result is worth it! I added S-20-05-N ([www.supermagnete.de/eng/S-20-05-N](http://www.supermagnete.de/eng/S-20-05-N)) and S-08-05-N ([www.supermagnete.de/eng/S-08-05-N](http://www.supermagnete.de/eng/S-08-05-N)) discs to the hanging ring magnet. This leads to quick rotational movements. I arranged the rest of the disc magnets in a circle. Inside the circle I created another one with cube magnets.





Video, 1.1 MB

A totally different pendulum movement, as shown in the video.

### **Used super magnets**

you can use many different types of magnets for the pendulum. It work with only three magnets, but the more magnets you use the more exciting it gets. I used the following magnets:

- 1 R-10-04-05-N ([www.supermagnete.de/eng/R-10-04-05-N](http://www.supermagnete.de/eng/R-10-04-05-N)) ring magnet for the actual pendulum
- small S-08-05-N ([www.supermagnete.de/eng/S-08-05-N](http://www.supermagnete.de/eng/S-08-05-N)) disc magnets for the metal plate
- 1 larger S-20-05-N ([www.supermagnete.de/eng/S-20-05-N](http://www.supermagnete.de/eng/S-20-05-N)) disc magnet, which I placed in the back corner of the metal plate as a sort of satellite dish along with a few ...
- (W-05-N ([www.supermagnete.de/eng/W-05-N](http://www.supermagnete.de/eng/W-05-N))) cube magnets.

**Articles used**R-10-04-05-N ([www.supermagnete.de/eng/R-10-04-05-N](http://www.supermagnete.de/eng/R-10-04-05-N))S-08-05-N ([www.supermagnete.de/eng/S-08-05-N](http://www.supermagnete.de/eng/S-08-05-N))S-20-05-N ([www.supermagnete.de/eng/S-20-05-N](http://www.supermagnete.de/eng/S-20-05-N))W-05-N ([www.supermagnete.de/eng/W-05-N](http://www.supermagnete.de/eng/W-05-N))

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