



Made in Switzerland  
GEOMAG SA  
CH-6862-Rancate Switzerland  
Via Alla Rossa 1  
e-mail: [geohelp@geomagsa.com](mailto:geohelp@geomagsa.com)  
[www.geomagsa.com](http://www.geomagsa.com)

# GEOMAG

magnetic world

The Original

51.5

Geomag

Titel nr. /.

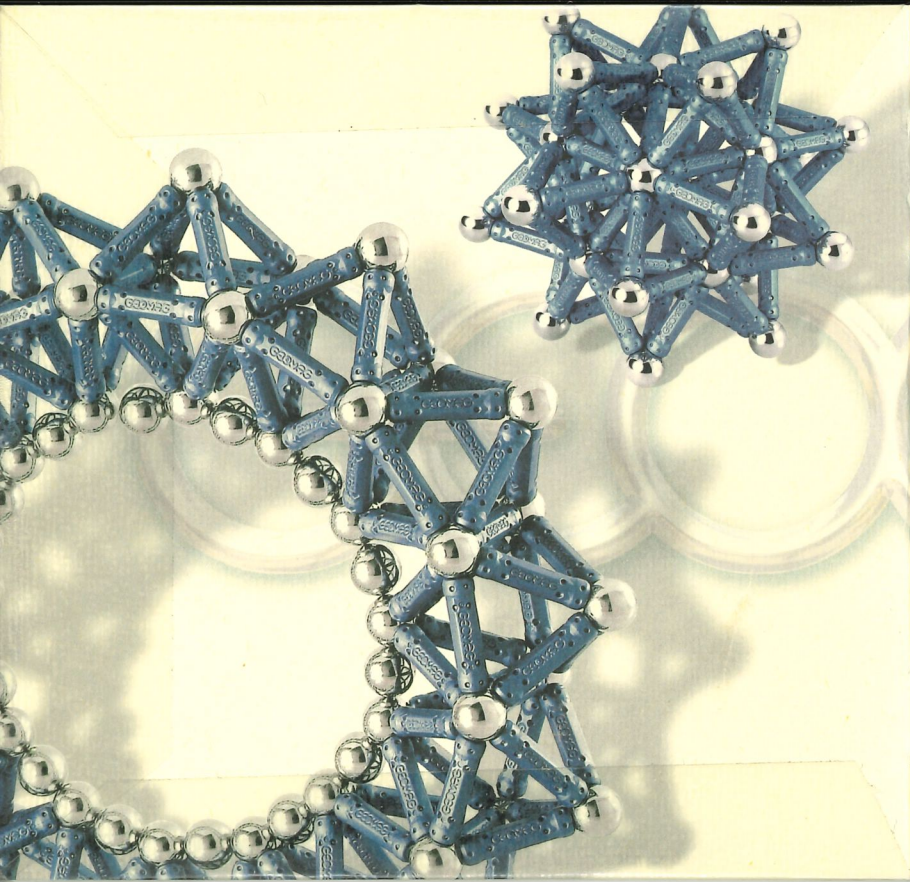
25 5 002 9

3



Amtscentret for Undervisning

Årh



**Geomag** is an ingenious system of simple construction made of magnetic rods and chromed steel spheres. A huge number of shapes, geometric figures and wonderful bidimensional and tridimensional realistic models can be infinitely constructed.

**Geomag** stimulates creativity and logical reasoning; it develops manual abilities, sense of proportion and one's ability to construct anything. The variety of the shapes and their transformations make it possible to renew structures continuously.

It's ideal for "kids of every age" (from 6 to 99!) who can enter the fascinating world of magnetism! An amusing activity to give vent to one's own fantasy, but a clever one too! As a matter of fact, with Geomag it is easy to learn some fundamental natural laws of physics and geometry and to approach the first notions of chemistry, architecture, engineering and more in a simple and spontaneous way.

But there's more! **Geomag** can also become an amusing pastime for the whole family, uniting parents and children in an activity of extraordinary creativity. The pleasant shapes made with **Geomag** can also become elegant decorative objects to display in your home. But the surprise does not end here, because **Geomag** also appeals to adults, even to the most serious managers and professionals, who see it as a 'Stress Buster'.

## The main elements of Geomag

**Geomag** is made up of two structurally very simple elements:



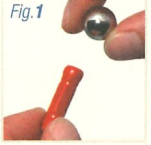
a nickel-plated steel sphere ( $\emptyset$  mm. 12.7)



a plastic rod (27 mm. length and 7.4 mm. max diameter) featuring two permanent magnets placed at the two extremities and a steel plug positioned between the two magnets

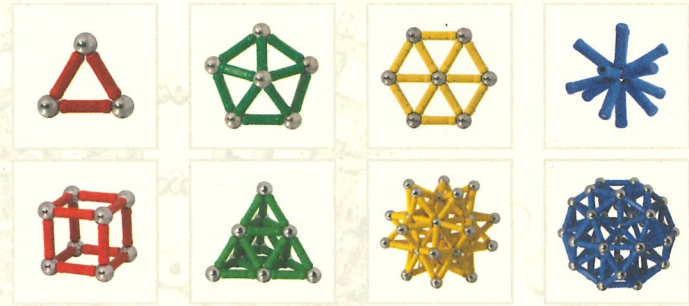
## Operation

Fig.1



If the sphere is drawn near to an extremity of the rod, as shown in figure 1, it is attracted. The same operation can be repeated on the other extremity of the rod, thus generating the first 'compact module' to which to attach other rods and other spheres. Starting from simple polygons, you will gradually be able to create larger, more complex, and more amusing ones. This is the first step in constructing bidimensional shapes of various dimensions, simple models, and complex tridimensional structures.

Up to 14 rods can be attached to a single sphere.



To become real experts at **Geomag**, it is sufficient to follow some simple fundamental rules. One only needs to follow 2 basic conditions to take advantage of the secrets of **Geomag**:

### Condition 1

*obtaining the maximum magnetic force and static solidity*

### Condition 2

*obtaining the maximum dynamism*

## Condition 1 - Obtaining the maximum magnetic force and static solidity

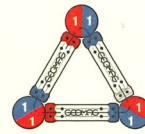


Fig.2

One of the best known laws of magnetism is now respected: the one by

To obtain the maximum magnetic force and static solidity, it is necessary to correctly direct the rods towards the spheres. The rods must be touching both a North and a South pole of the sphere (as shown in figure 2), in order to ensure that the polarities are in series.

which opposite poles (N-S) attract each other, while equal poles (S-S or N-N) reject each other. Balanced spheres and polarities of the rods in series=maximum force and maximum magnetic attraction. This is the preliminary condition to be able to construct complex static models.

### The secret of the force and the stability of Geomag

All the great secret forces of **Geomag** derive from its exceptional magnetic circuit which exploits the energy contained in the magnets of the rods and transfers it in a powerful way. How is this effected? just follow the rules of *Condition 1*. Here is a practical example. Construct a simple triangle, then take a sphere and draw it near to every single sphere forming the triangle (see Fig. 3). One of the 3 spheres of the triangle may exert an attraction towards the sphere that we draw

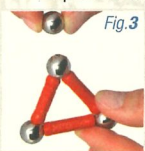


Fig.3

near. If this should happen, it means that the spheres of the triangle have been turned to magnets by induction, and that the magnetic flow is not at its maximum power, but it is partially dispersed in other directions. In order to make it balanced, try to detach one or more rods of the triangle and to attach them again with polarities inverted (see Fig. 4).



Fig.4

Now if you try to draw the sphere near to the triangle again, it should not be attracted by other spheres. This means that the spheres are no longer magnetized, they are balanced, with the rods orientated with the polarities (opposite signs) in series. Now all the magnetic flow, is concentrated within the triangle without any dispersion. The force of attraction between spheres and rods is now the maximum

achievable. Here is the secret of the extra strength of **Geomag** that must be utilised in the construction of very large and complex tridimensional figures.

Let's discover how, by exploiting the "secret of Geomag", even more interesting and complex models can be constructed. Not only does the difficulty increase, but the entertainment and the challenge too! Let's start with a pyramid with a triangular base: We construct starting from a triangular base with two rods on every side, as shown in figure 5, and we continue by closing the figure with backing triangles (see Figs. 6, 7 and 8).



Fig.5



Fig.6

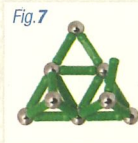


Fig.7



Fig.8

Let's continue with a sphere (Fig. 12) made out of 20 triangular faces: We construct starting from a pentagon backed on its center (Fig. 9) and by adding triangular shapes on every side, until the polygon gets closed by another pentagon on top (see Figs. 10 and 11).

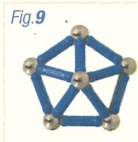


Fig.9

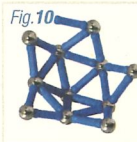


Fig.10



Fig.11

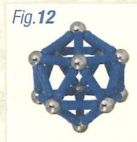
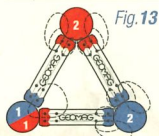


Fig.12

## Condition 2 - Obtaining the maximum dynamism



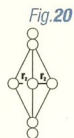
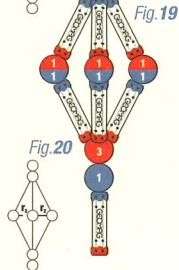
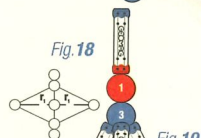
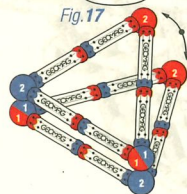
The opposite of *Condition 1*, in this case the rods must be oriented towards the spheres, so that the polarities are no longer in series and do not respect (as shown in Fig. 13) the sequence North pole-South pole anymore. This way, the magnetic flow is not closed anymore, and that makes it possible for the spheres to turn into magnets attracting other external elements. In this case the spheres are not balanced and the polarities of the rods are not in series: the magnetic force obtained is lower, but the dynamism is higher, and that allows a more versatile use of **Geomag**. Let's see how...

## The secret of the great versatility of Geomag: dynamism and movement

Let's begin with a simple example! Start by constructing figure 14 shown. Attach a sphere and bar to the top of the pyramid, holding them between your fingers.



The attractive force will enable you to raise the model and make it rotate on its axis. Construct the hexahedron illustrated (Fig. 15) and make it rotate (Fig. 16) in the same way as you did with the pyramid. While it is rotating, try to set it on a flat surface: with a simple spin of the wrist you will be able to increase its rotating movement, until you can detach it (with a sharp pull) from the sphere held by the rod in your fingers. The hexahedron can then be left to rotate alone, and then picked up again before it falls and stops. The gyroscopic effect is created by the equilibrium maintained by the spinning shape. Let's see some other demonstrations of the dynamic effects that can be created with **Geomag**.



## "MAGIC ROCKER": the "repulsion" between the spheres

Make two triangles, following the arrangement of the polarities as represented by the colours in figure 17. You will be amazed to see the dynamic effect created by the striking "rocking" of the upper triangle! This movement is produced by the downwards thrust exerted by the upper triangle and the upwards thrust produced by the magnetic repulsion of the two (grey 2) spheres of the same polarity.

## "DANCING BALLERINA EFFECT": the principle of energy conservation

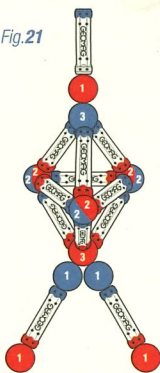
To make the model in figure 19, it's absolutely necessary that the first sphere (blue 3) above the hexahedron and the last sphere below (grey 3) will have monopolarity, so to attract other spheres. This increases their attractive force on the central structure, made up of three pairs of bars arranged in the manner shown. If you hold the upper and lower bars between your fingers you will see how the model not only rotates... but also lengthens and shortens in a dynamic manner. Let's see how.

Starting from the position shown in figure 18, use your little finger to rotate the central section of the model. As it is rotating, stretch the figure slowly, extending it as shown in figure 20. You will observe that as you stretch the model the speed of rotation increases, while if you shorten it the rotation slows down... and so on. This effect can be likened to the peculiar and quite elegant movements of dancing ballerinas,

when they spin around on their feet, opening or closing their arms. But that's not all... another extraordinary example of the dynamism of **Geomag** is provided by models which illustrate the principal of centrifugal force and inertia between monopole spheres. Figure 21 appears to be identical to the hexahedron of figure 15, but it's not, because in this case the spheres (blue 3 and grey 3) set at the extremities of the model are both monopole (that is, they can attract other spheres) with the maximum attractive force.

If you now hold the upper bar between your fingers and rotate the model gently, you will observe that the two bars attached to the lower part of the model diverge increasingly as the speed of rotation increases. This effect is caused by the centrifugal force. As the speed is decreased the bars descend again. But once more, this is not all: start again from the beginning and rotate the model. When the speed of rotation has increased, stop the movement of the hexahedron suddenly. You will observe that, although the hexahedron is still, the two lower bars continue to rotate, moved by the force of inertia. Seeing is believing...

Fig.21



Visit our website and download the instructions  
in your own language

Vai al nostro sito e scarica le istruzioni  
nella tua lingua

Allez sur notre site et cliquez les instructions  
dans votre langue

Gehen Sie auf unsere Webseite und laden Sie die Anleitung  
in Ihrer Sprache herunter

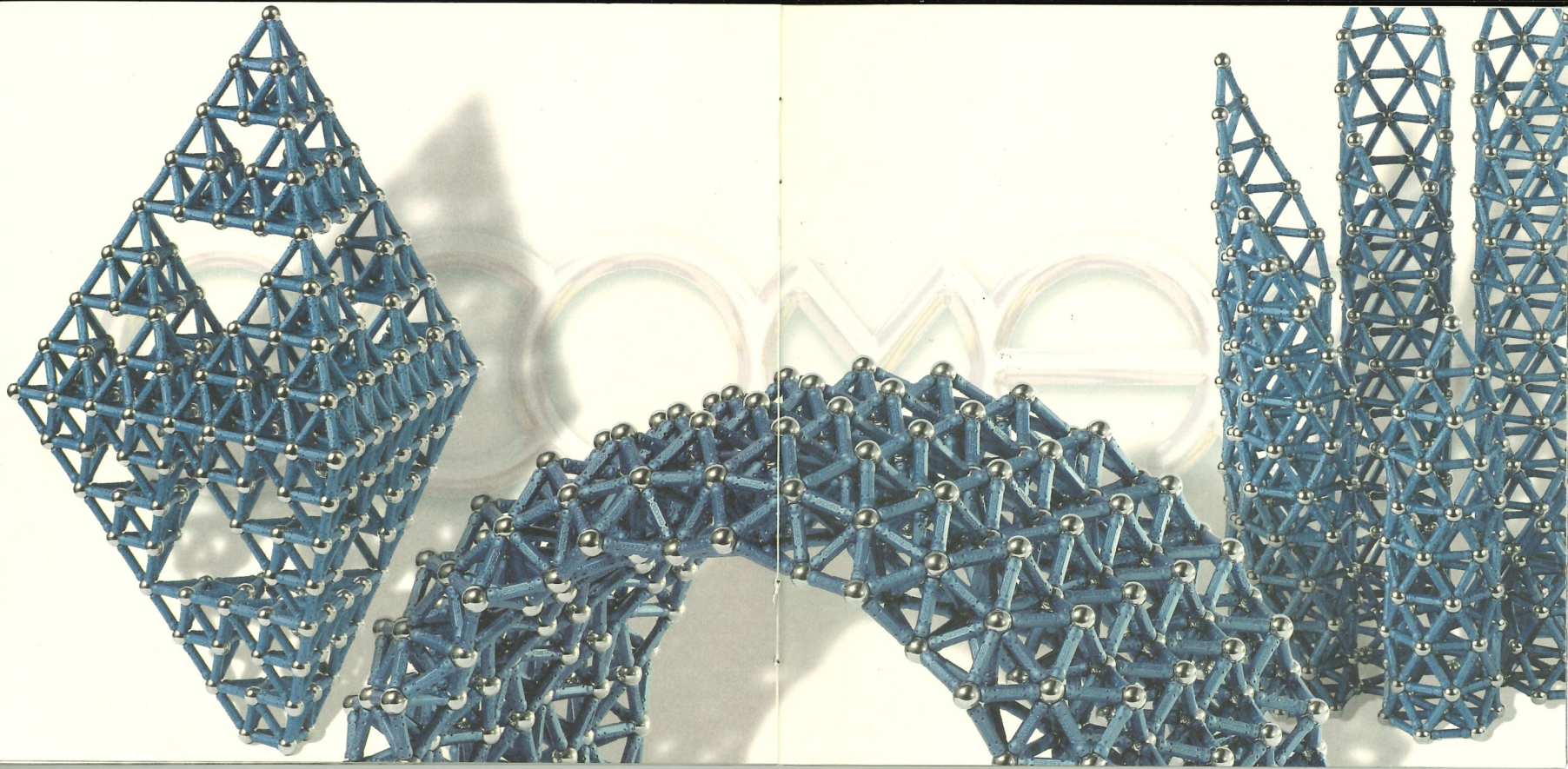
Visita nuestra página web y baja las instrucciones  
en tu idioma

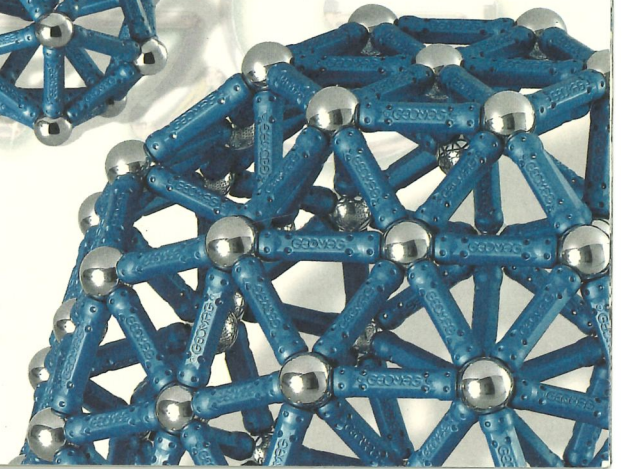
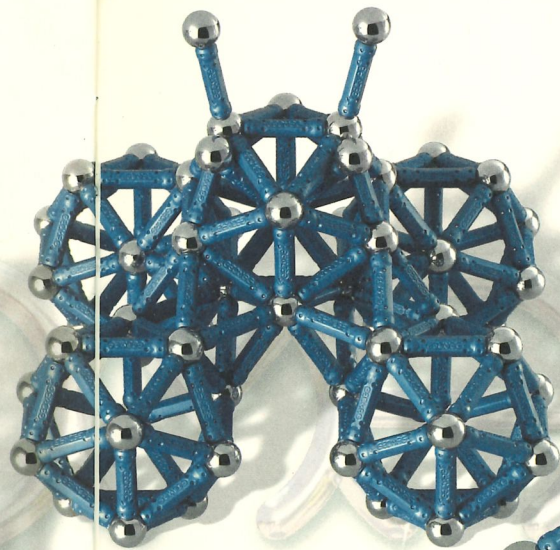
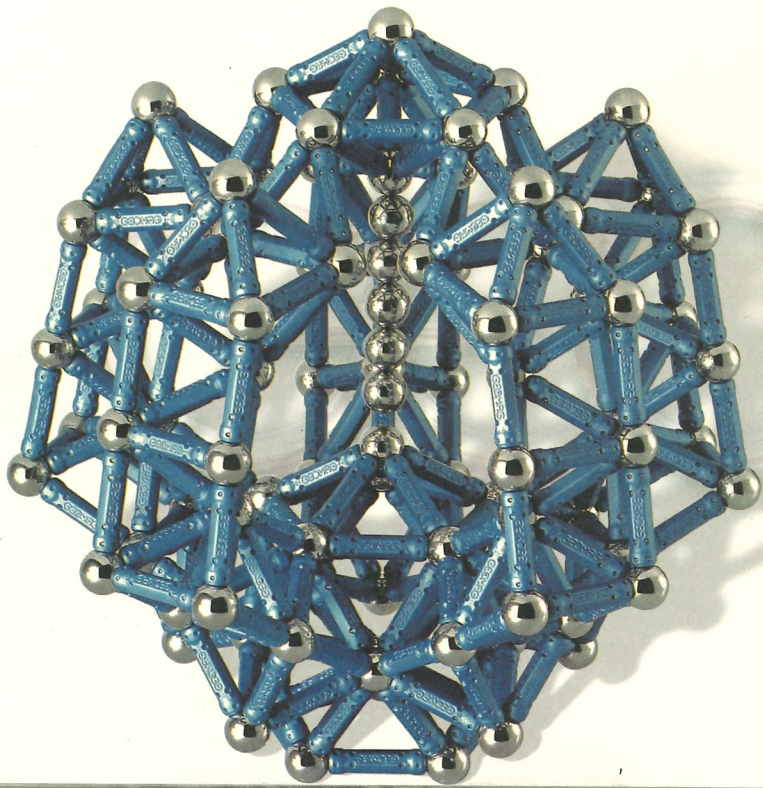
Vá ao nosso site e descarregue as instruções  
na sua língua

Ga naar onze site en download de instructies  
in je eigen taal

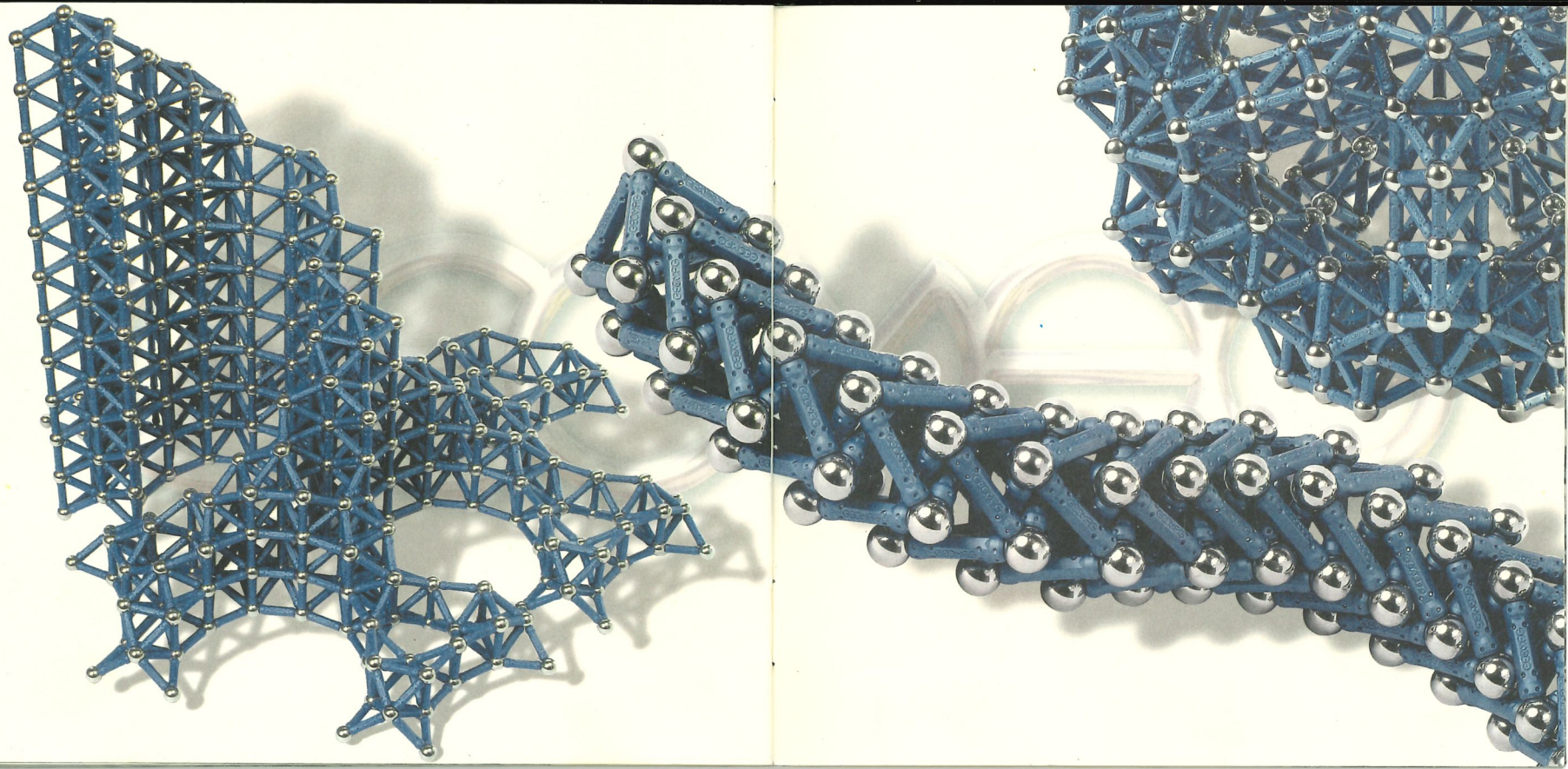
Επισκεφθείτε την ιστοσελίδα μας και κατεβάστε τις  
οδηγίες στη γλώσσα σας

[www.geomagsa.com](http://www.geomagsa.com)  
Have a lot of fun!









# GOO



Not suitable for children under 3 because of small parts: choking hazard. Retain our address for future reference. The rods contain strong magnets. Keep away from credit cards, TV screens, computer monitors, audio and video cassettes, floppy disks, medical equipment (pacemakers). Store pieces in dry places.

Non adatto a bambini di età inferiore ai 3 anni, contiene parti piccole, rischio di ingestione. Conservare il nostro indirizzo per futura referenza. Le barrette contengono potenti magneti: tenerle lontano da carte di credito, schermi tv, computer, cassette audiovideo, floppy disk, dispositivi medici (pacemakers). Tenere i pezzi in luoghi asciutti.

Geomag is a registered trademark. All Rights Reserved.

U.S.A. Patent number 6.566.992 • AUSTRALIA Patent number 747.183 • ITALIA Brevetto numero 1.301.090  
EUR Patent number 1349626&1080476

