

**110.213**

# Magnetic-Football game



### Necessary Tools:

Fret saw, Fine saw  
Drills ø 3mm, 15mm  
Sandpaper, Wood file  
Wood glue + All purpose glue  
Electric screwdriver  
Countersink  
Paint brush  
Wood varnish/ acrylic paint  
Pencil / ruler  
Clamp

### Warning!

This product contains small parts that can be swallowed. There is a danger of choking. This product contains a magnet. Swallowed magnets can block the intestines and cause severe internal injury. If a magnet is swallowed by accident contact a doctor as soon as possible

### Please Note

The OPITEC range of projects is not intended as play toys for young children. They are teaching aids for young people learning the skills of Craft, Design and Technology. These projects should only be undertaken and tested with the guidance of a fully qualified adult. The finished projects are not suitable to give to children under 3 years old. Some parts can be swallowed. Danger of suffocation!

PARTS LIST				
	Part			Part-No
Plywood	1	500x300x4	Base	1
Plywood	2	500x40x 8	Sides	2
Wood strip	2	300x40x10	Goal	3
Wood strip	2	300x20x10	Sides	4
Wood strip	2	350x30x30	Foot	5
Dowel	2	150x30	Playing rod	6
Cellular sheet	1	ca. 145x100x2	Buffer + Foot	7
Wood ball	3	ø20	Heads + football	8
Wood wheel	2	ø40	Lower part of players	9
Wood ball	2	ø50	Counter	10
Chipboard screws	24	16x3	Fixing	11
Magnet, neodym	4	ø15x6	Magnets	12

## Safety notes for working with magnets



Permanent magnets and magnetic article are technical products that require safety knowledge. All persons experimenting or working with magnets should read these note and keep them in mind!



### Articles that can be influenced by magnets

- Computers or electronic data
- Electronic machines
- Heart pacemakers
- Injuries caused by crushing or pinching
- Danger caused by magnetic splitters
- Danger of fire and explosion
- Health dangers caused by contact with drinking water, food or ski



### Working with magnets

- People with heart pacemakers should avoid contact with all types of magnetic fields
- Computers and other data storage units should be kept away from magnetic fields
- Magnets must be carefully handled in the presence of other magnets and objects made from iron. There is a danger of injury caused by pinching or squashing-wear safety protection
- Magnets must not be used in an atmosphere where there is a danger of explosion
- Items made from iron should not be left near magnets
- Strong magnets can splitter when under attraction, to avoid injury when working with magnets wear safety glasses
- When working with magnetic properties in mechanical projects there is a danger of fire
- Glowing or burning magnets should not be extinguished with water, CO<sub>2</sub> or halogen – use sand or powder extinguisher
- The presence of hydrogen can cause magnets to deteriorate and lead to them breaking up- avoid all contact between magnets and hydrogen
- Some magnets have a nickel coating which can cause skin allergy- handle – if this happens avoid all contact



### Be careful with magnetism

- Be careful of magnetic fields, magnets can spring apart and cause accidents
- Fix magnets in a holder and never hold them freely in your hands
- Magnets can shatter
- Keep your working area free from magnetic pieces
- Read any special makers instructions that come with the magnets

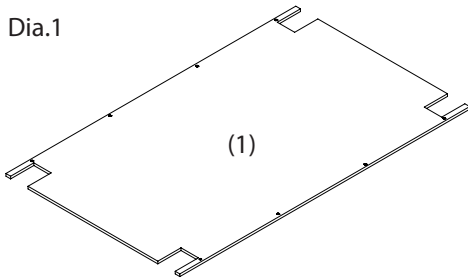


### Transport

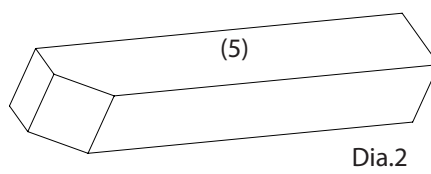
- When transporting magnets by air there are special regulations that must be followed
- This also applies to appliances with built in magnets- contact airline
- There are also regulations for sending magnetic goods by post – see Post Office



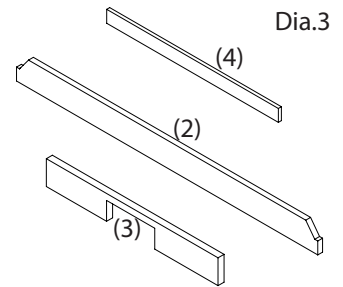
# INSTRUCTIONS



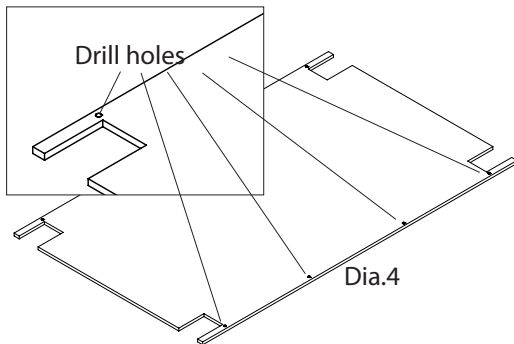
1. Mark out and saw the base (1) as in diagram 1 using the pattern ( Page 5) sand the edges to finish .



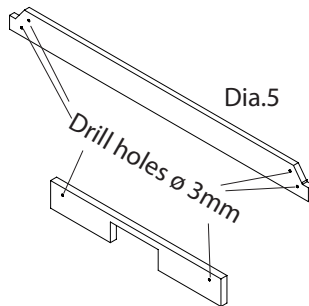
2. Take the wood strips (5) for the legs of the game and saw them in half ,chamfer the 4 legs on the sides as shown ( See diagram 2 and pattern on page 7)



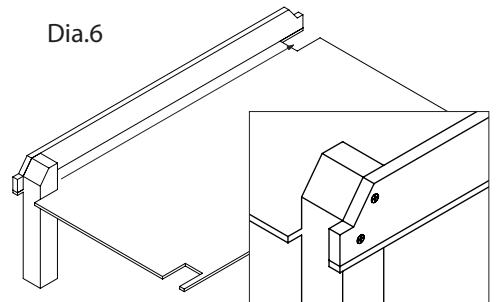
3. Mark out and saw out the sides ( See page 7) as shown .



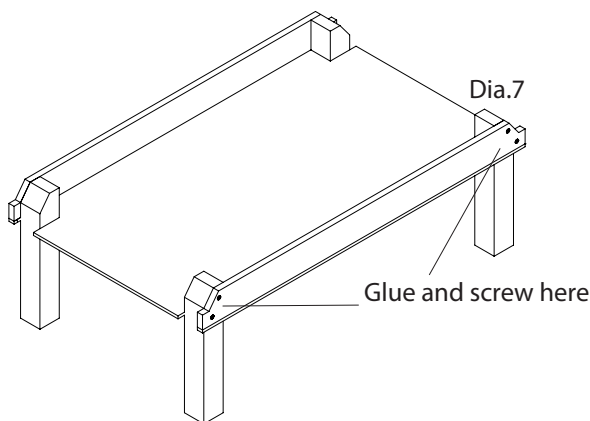
4. Drill the  $\varnothing 3\text{mm}$  holes for fixing the sides on to the base. Countersink the holes from underneath (See Dia 4 and pattern on page 5)



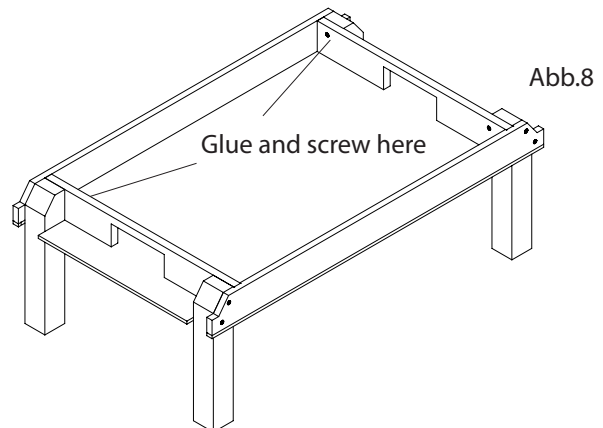
5. Drill the  $\varnothing 3\text{mm}$  holes for the later construction as shown in Dia 5 counter sink the holes on the sides and goal from the outside (Stencil 7)



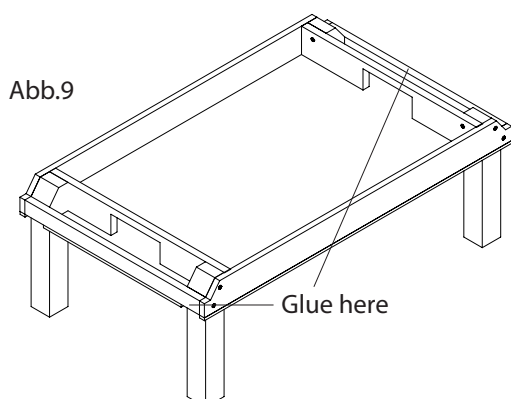
6. Offer up a side parts (2) along the base, glue and screw them into position from underneath .  
Note: the countersink holes are on the outside!  
Add the two legs as in Diagram 6, glue and screw them in position



7. Add the second side and legs, Glue and screw them in position (See diagram 7)



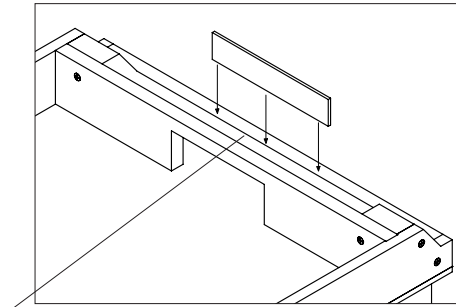
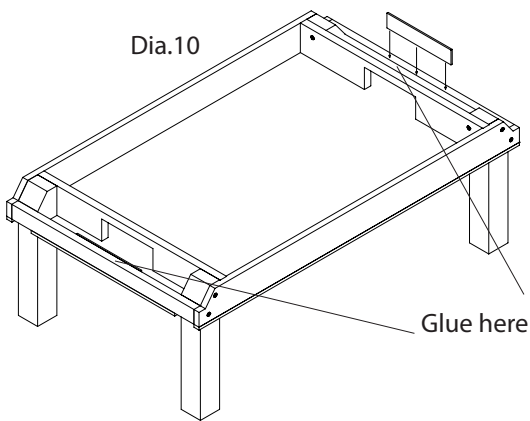
8. Add the goal strips (3) with the cut out for the goals as shown in diagram 7  
Glue and screw in position  
Note: The countersink holes are on the outside!



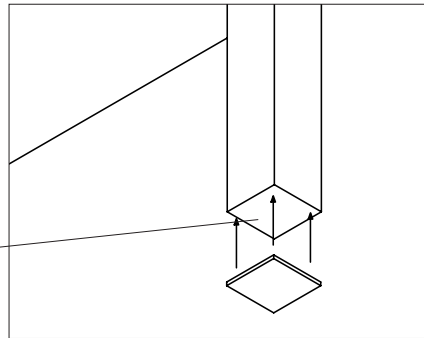
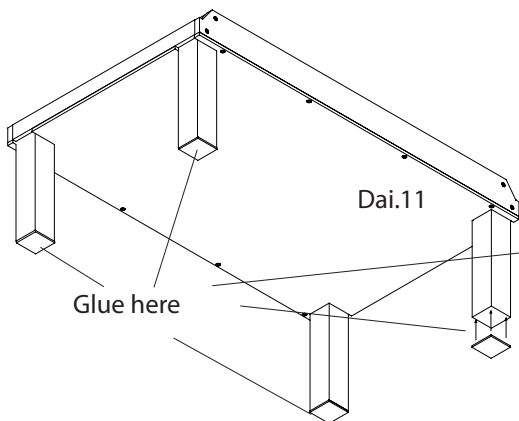
9. Add the two wood strips (4) on the feet and the base (Diagram 9).

The game can now be painted

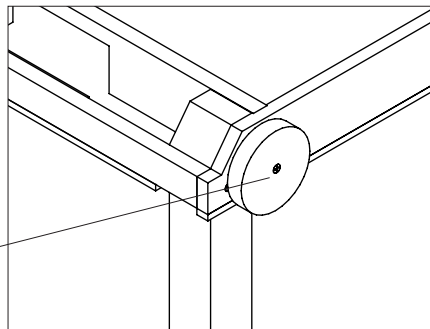
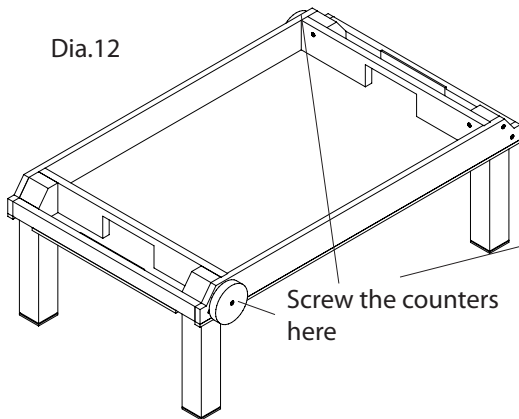
# INSTRUCTIONS



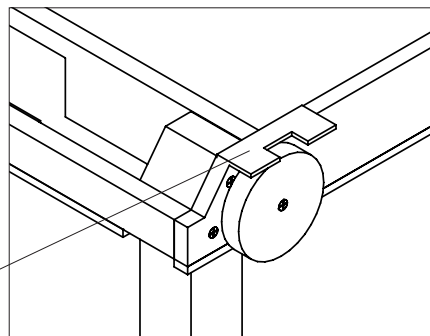
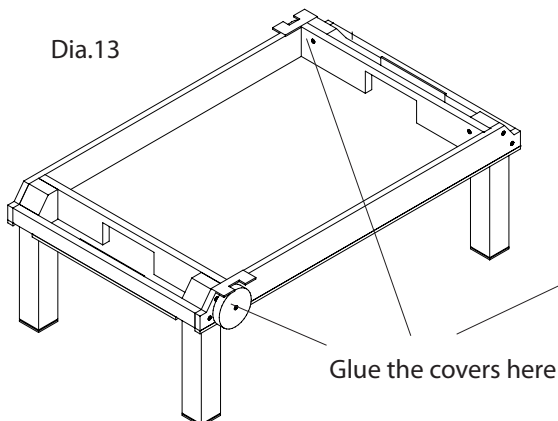
10. Cut the cellular foam sheet (7) to the pattern (Page 9). Glue the foam buffers 100x20mm in place behind the goal as shown in Diagram 10.  
Note: Decorate the buffer before gluing it in place.



11. Turn the football stand over and glue the four foam pieces 30x30mm on the bottom of the legs. This makes the game more stable in play (See diagram 11)



12. Mark out the middle of the wooden wheel.( Use a centre finder ) Drill a 3mm hole through the middle and countersink .Mark out the wheel in 0-10 sections ( pattern page 9) on the 50 mm counter wheel (10) Mount both the counters on the game so that they can turn. (See diagram 12 )  
Note. Paint the conter before mounting it in place

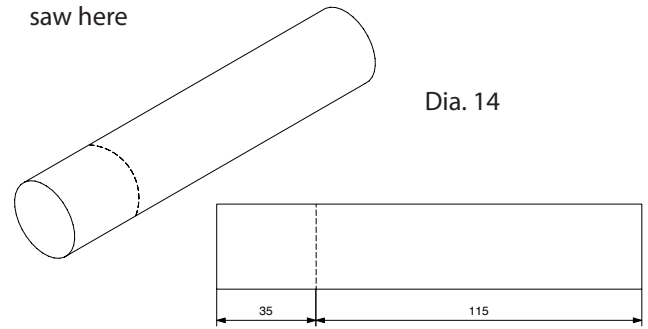


13. Use the remainder of the foam to make a cover for the counter wheel as shown in Dia.13 (12.00 o'clock position ) glue it on the side part  
Note: Decotate the foam before gluing it in postition

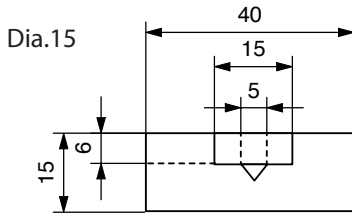
# INSTRUCTIONS

14. Saw the dowel (6) to length as in diagram 14.

saw here

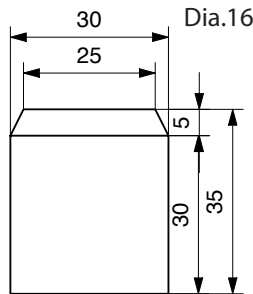


Dia. 14



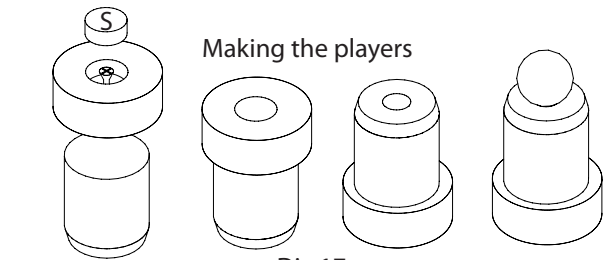
Dia.15

15. Drill a blind hole 6mm deep x 15 diameter in the middle of the wooden wheel. make the hole for the screw. (see diagram. 15)



Dia.16

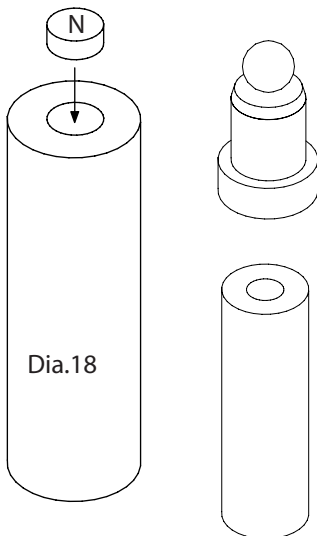
16. Take the part as in step 13 the sawn round part (Length 35mm) and on one side chamfer at ca. 30° with a file and sand paper. (see diagram 16)



Making the players

Dia.17

17. Take the round piece from step 15 and mark the middle top and bottom. Fit the pre drilled part (9) from step 14 with a screw (24) on the body. Glue a magnet (12) in the 15mm hole. Turn the nearly finished player upside down and make a rounded dip for the head (Wooden ball 8) glue the head in place. Repeat steps 13-17 for the second player.



Dia.18

18. In the remaining round piece (115mm) at one end drill a hole 15mm dia by 6mm deep. In this hole glue the second magnet (12) see diagram 17

## IMPORTANT:

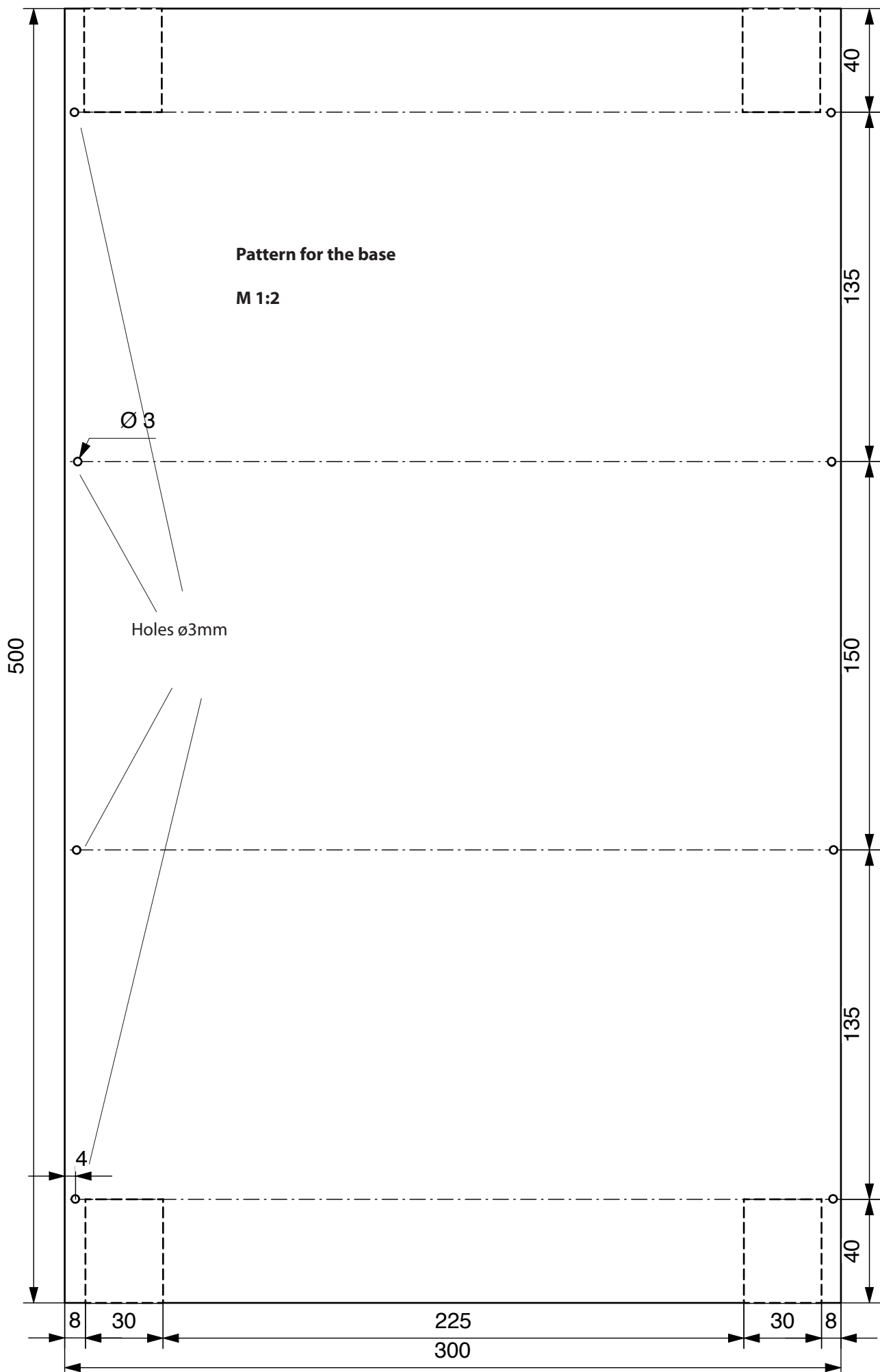
When gluing the magnets in place be aware care of the polarity- the magnets must attract each other ( Mark the figures and the magnet on the play stick!)

Finally paint the figures





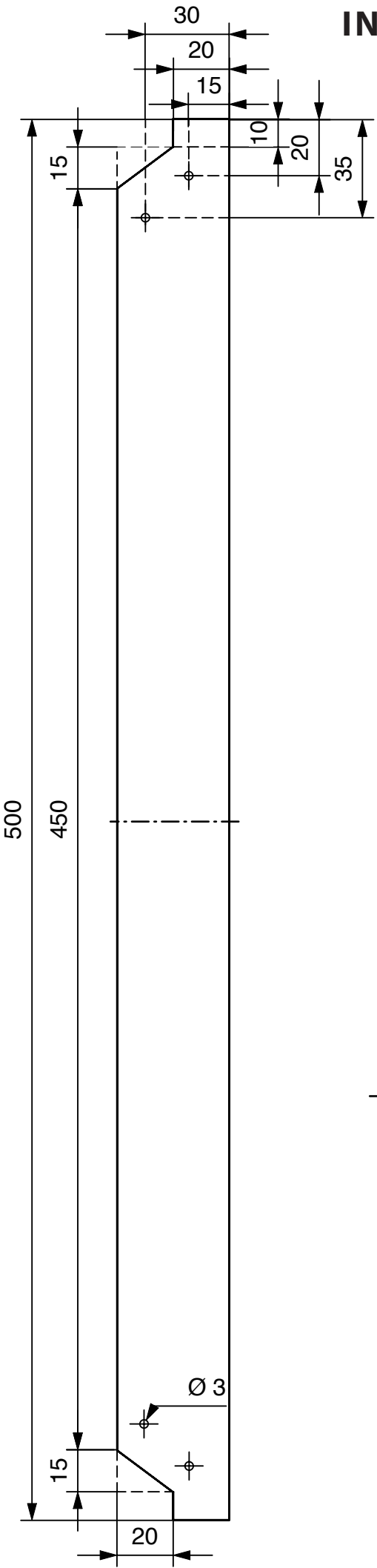
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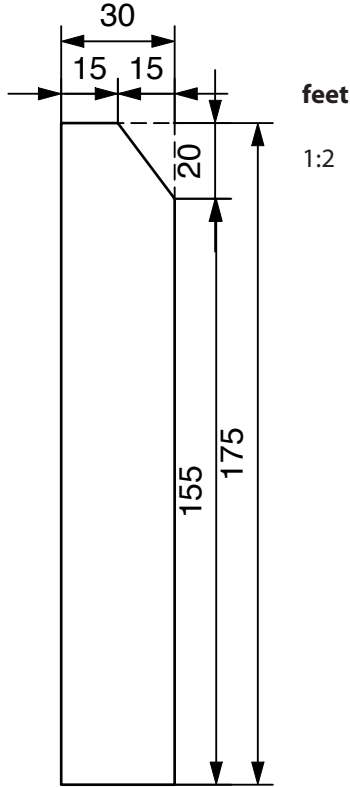
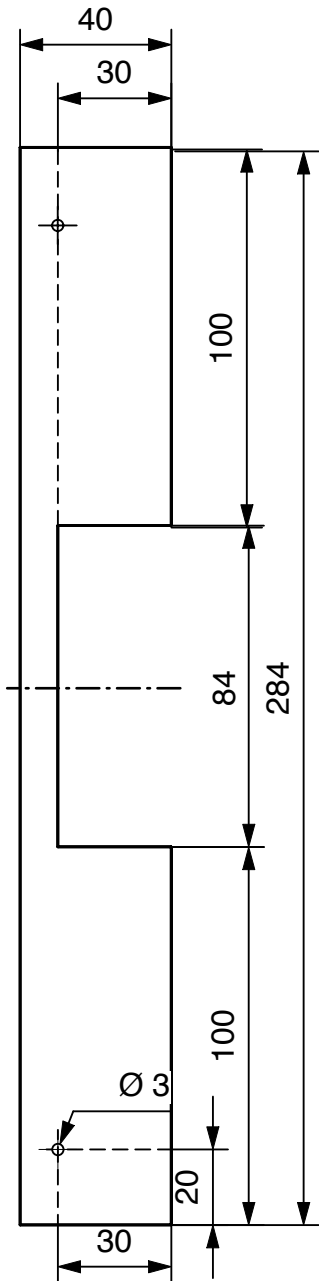


INSTRUCTIONS

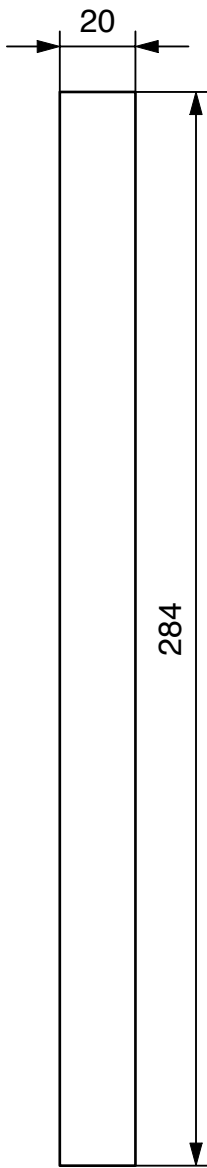


Side parts with  
holes

Scale 1:2



feet  
1:2

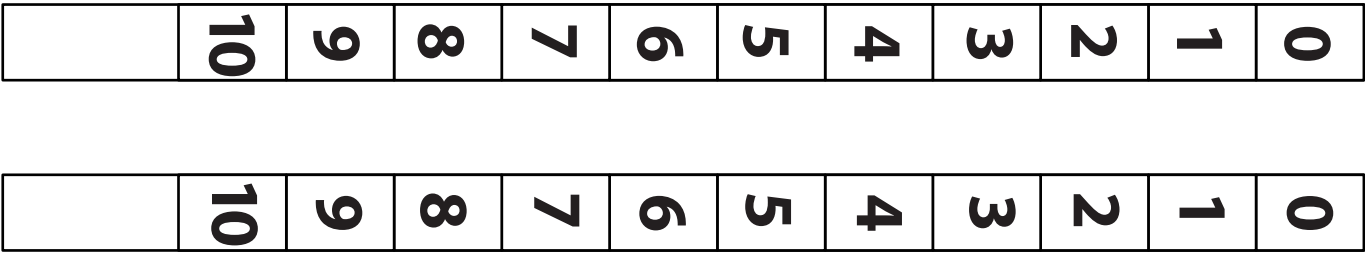




# INSTRUCTIONS

Pattern for the counter  
(Cut out and glue on to the wheel )

Scale 1:1



Pattern  
Modelling foam parts

Scale 1:1

