

self **CHALLENGE'22** eSTEAM

TUTORIAL



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make it

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Welcome to the **SelfeSTEAM Challenge '23**

In this guide you will learn how to assemble the marble run in a simple way.

Since there are many ways to get the result, you can let your creativity run free, the main thing is that the start and end point of the track remain the same, as shown on the sketch sheet provided.

With the included material you can easily assemble a functioning marble run. But you can also use other materials or think up your own mechanics for the marble run!

These instructions should give you a start-up aid if you are starting such a project for the very first time...

Visit our website to find out which categories have prizes to be won.

The following pages have been translated with [deepl.com](https://www.deepl.com)

No tools - no action!



You will need the following tools to build your marble run:

Adhesive tape Glue gun (or other glue)
Drawing pencil Ruler
Wire stripper
Scissors
narrow, flat screwdriver

Search alternatives

If you are missing something in this list, you can also work with alternative tools. Instead of the wire stripper, you can also try this step with a pair of scissors... but it can be a bit trickier.

Support is allowed

You can get help especially with the tricky steps. Work together with friends, if you come across steps that still seem too dangerous, then ask an adult.

Safe is better

You must be careful when working with sharp and hot tools. You can find some tips at www.makerbuzz.lu... and in case of a small mishap you will find suitable plasters in the Self eSTEAM Kit.



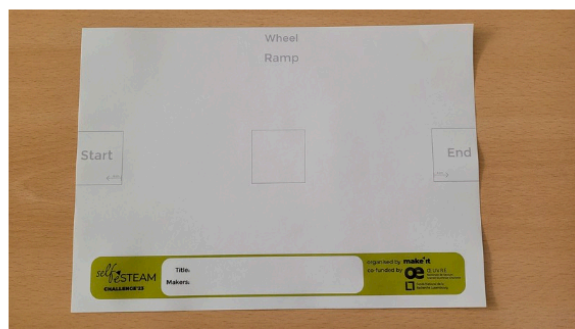
First, mark your sides of the base plate in the centre with the letters A, B, C and D. This will help you to find your way around. This will help you to find your way later.



Then use this attached sheet to draw the start and end points of the catch basins.

Place the sheet centrally on the edge of the A side.

You can also stick the sheet on the plate.



For the following pages, please refer to the pictures in the German instructions.

page 5

Stick the 4 glue dots on the back of the board so that the board does not slip and you can pick it up better. Do not glue the dots too close to the edge of the corners.

page 6

In the kit you will find a plate with pre-cut parts that can be assembled for different purposes. First, we build a cube on which a collecting container for the marble is placed. The collecting container will be dealt with in a later step.

[Image]

Press the 5 pieces shown here (marked in green) out of the pre-cut plate to assemble the first cube.

page 7

Since the pieces don't hold by themselves, you have to help them with rubber bands or some glue so that the cube doesn't fall apart.

[Image]

Do the same for the other 2 cubes. They all have a different height.

We're sure you'll find the parts yourself now!

page 8

Now press out the parts for the wheel holder and put them into each other. If the parts are not tight enough, glue them additionally.

page 9

Now take out the parts for the ramp and put them together. In some parts there are two different notches. Try out which one suits your track better.

page

Attach the wheel centrally to the back of the round disc:

[Image]

To do this, you can fix the wheel with hot glue, or lash the rim of the wheel with cable ties in at least 3 places with the holes around the centre of the disc.

Check that the wheel is as central as possible and firmly attached to the disc.

page 11

Now put the motor on the wheel.

[Picture]

There is a nub on one side of the yellow part of the motor bracket. Attach the axle to the wheel so that the nub points upwards, away from the wheel.

page 12

Stick the medium cube on the start position and the large cube on the end position as shown on the attached sheet.

Now glue the plastic containers onto the cubes. Make sure that the opening of the container on the smaller cube points towards the centre of the plate, the other container must point with the opening away from the plate.

page 13

Tape the wheel holder centrally to the edge of the B side.

[Image]

Carefully pull the cables through the hole in the bracket. Put the wheel with the disc on the holder. Secure everything with cable ties and shorten them.

page 14

Carefully strip the cables of the motor and the battery compartment with wire strippers.

[Image]

Fix the cables of the motor and the battery compartment in a luster terminal. One cable of the battery compartment should meet one cable of the motor in the luster terminal. Try how you have to connect them so that the wheel moves clockwise.

page 15

Place the battery in the battery compartment.

Is your wheel turning now too?

If not, check your cables and connections

[Image]

Tape the ramp in front of the wheel. The distance to the wheel should be 1 mm so that there is no friction between the wheel and the ramp.



The motor is actually designed to run on 2 batteries. However, so that the wheel turns more slowly, we are only using one battery for the project. It is therefore possible that the motor does not "start up" immediately. If this is the case If this is the case, it helps if you "push" the disc.

page 16

Take a ruler and cut 4cm off the grey tube. Cut it lengthwise so that you have two pieces. Cut a small piece of cardboard and stick it to the back of your tube.

[Picture]

This becomes a shovel. Remove the excess cardboard. With a piece of tape you can now stick your self-made shovel to the wheel.

page 17

Test whether the marble is picked up by the shovel and transported upwards.

page 18

Glue the small cube in the middle of the plate as shown on the attached sketch sheet. Take a pair of tongs and two chopsticks and build your track. You can also build other tracks, there are no limits to your creativity!

page 19

Cut off some extra cardboard to make a frame for the upper track. This is where the ball is collected and transported to the upper collection container.

page 20

Now your marble run is ready and you can decorate it! The theme of the challenge is "water" - so think about how your marble run should showcase the saving of this valuable resource. Through which world does the water (the marble) move from the start field to the finish field on your island? What would the world be like without nature, mountains, people and animals?

Show us how much you care about our planet!

Have fun researching
and tinkering!

Hope to see you and your robots at
the grand finale
on 17 June 2023!

See you soon
Your Make It - Team