Task 1: One-Line Robot Art

When robots become artists

Robots are not only used to build cars or explore distant planets. They can also draw pictures, reproduce patterns and create precise designs. Machines called *plotters* use controlled movements to draw on paper. The challenge is to turn a creative idea into a sequence of movements a machine can follow.

Can your team teach a robot to become an artist?



Fig. 1. Robots can be artists too! For real-world examples of the robot arm drawings, visit the website of the young Slovak artist Michal Adamik: `michaladamik.com`. *Illustration generated by Copilot.*

1 Your challenge

The task

Create an original picture using your mBot2 robot and a marker — in one continuous stroke!

Attach a marker to your robot, and program it to draw your picture on paper. You can use just the ordinary tape to fix the marker to the robot body, or you can design the complex 3D printed holder. Your picture can show anything you like: an object, an animal, a pattern or an abstract design, but it has to be drawn in the single stroke. Plan carefully: once the robot starts drawing, you cannot lift the marker or manually move the robot.

2 Rules

- The marker must remain in contact with the paper throughout the drawing attempt.
- You may cross a line that has already been drawn. However, **you must not travel along an already-drawn line segment again**, even in the opposite direction.

- Do not lift the marker or manually reposition the robot while drawing.
- You may use any suitable materials and manufacturing methods for the marker holder. 3D printing is allowed but not required.
- You may program the robot in mBlock (blocks) or in Python and use any movement commands and programming techniques available there.
- The picture's subject and style are entirely up to your team.

Tip

A complicated drawing is not automatically a good drawing: creativity and a well-planned result matter more than a random collection of lines.

3 What to submit

The complete solution must be in English and must include all four items below:

1. **Solution description:** a short text describing your idea, how you planned the path, any problems you overcame, and how the marker holder works, how the marker is secured and how it can be replaced.
2. **Video:** show the robot's drawing attempt clearly. The video should allow the judges to see whether the task was completed in one continuous stroke and whether the robot followed the rules. Keep the drawing area and the robot visible throughout the attempt where possible.
3. **Photo documentation:** a clear photograph or scan of the resulting drawing, and at least two photographs from the work process — one showing the marker holder attached to the robot and one showing the team together with the robot while it completes the drawing.
4. **Program:** submit the complete program used for the attempt (an mBlock project or a Python listing).

Every attempt counts!

Your video should clearly document what your robot can do. We would also love to see unsuccessful attempts — they are a valuable part of engineering.

Could not complete the whole picture? **Submit your partial solution anyway!** You can still earn points for your progress, your ideas and your technical work. Other teams may be facing similar challenges. Be honest about what works and what does not work yet.

4 How will your work be judged?

The judges will consider the artistic quality and originality of your picture, the thought put into its composition, the complexity of its elements, the accuracy of the robot's movement, and the stability and practicality of the marker holder. They will also check how well the submission follows the rules and includes the required documentation. Evaluation table will be published later.

Don't forget

Submission deadline: 15 January 2027

Plan it. Build it. Program it. Draw it in one go!

