TangIn
Tangible Programming & Inclusion

TangIn Toolbox
Introducing MI-GO

All ages

Robotics and Algorithms	Length measure
Rotation	Itineraries

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 /tanginproject
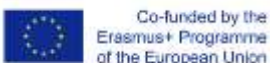
Summary

Introduce the story of MI-GO and tangible programming with blocks. MI-GO is a robot that embodies tangible programming concepts. The first part of the session is dedicated to the customization of MI-GO where students use their imagination and art skills to build a character. Students will also learn that the robot is programmed using blocks and the function of each block.

Expected duration: **50 min** (the lesson plan duration is flexible, and teachers can adapt them accordingly to their needs and class duration).

Learning Outcomes

At the end of the session, students are expected to:

- Understand how MI-GO is programmed;

- Know the functions of some blocks;

- Write a simple algorithm;

- Express themselves freely through drawing;

- Develop transversal competencies such as problem-solving, communication and reasoning;

- Develop group work skills, namely, to respect and favor the inclusion of all elements, regardless of gender, culture, etc.

Links With Curriculum Topics

Covered Curriculum Topics		
	Subject	**Topics**
Engineering	**Mathematics**	Geometry • Line, line segment and other geometric figures • Length Measure • Rotation (quarter turn) • Itineraries
	Artistic expression	Free expression drawing
	Technology	Programming • Fundamental principles and concepts of programming • Programs – Results, errors, and troubleshooting. Robotics • The notion of tangible objects • Programming objects to solve challenges

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Notes for Teachers

The teacher should prepare, in advance, all the materials needed and the classroom according to the activities to be developed.

The teams should be as heterogeneous as possible to foster the integration of all students.

It's important that clear rules are established in terms of group work. This way it avoids the most active children assuming the lead and the quieter ones only observing.

Each teacher should guide a maximum of three groups at once because it is still a discovery phase and, if there are a lot of groups, it is not possible to appropriately guide them. A solution can be to have more than one robot per group.
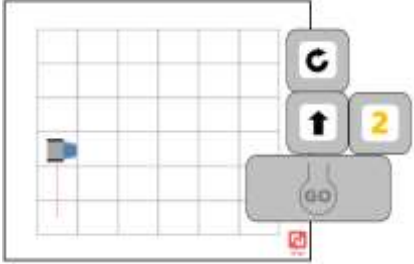
Teachers should consider the age of the students to adapt the activities and time of the lesson plan.

The customization of the robot is important to foster the initial student engagement and start establishing group dynamics.

Lesson Plan
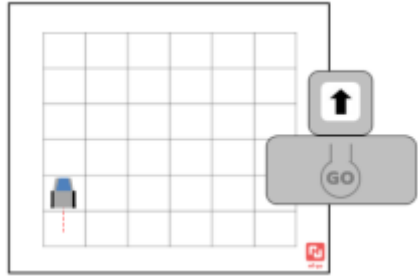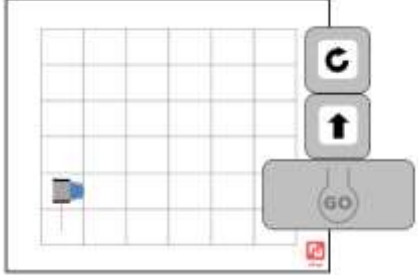
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Intro	5'	Class	"MI-GO is an extra-terrestrial robot that fell on Earth. He cannot go back home because he lost a lot of parts around the world. Now, we need to help him in his adventures. The only problem is that he only speaks the machine language, which is logic and algorithm. Do you want to help him?"	

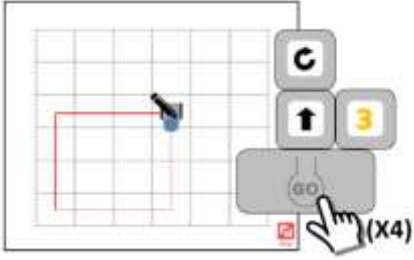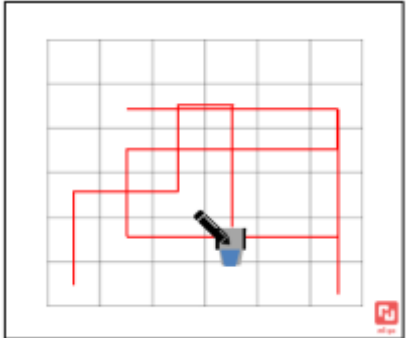| 🎬	🕐	👥	📄	🖼
Prep	10'	Group	Divide the class into groups. Hand out some art material: playdoh, stickers, paper, scissors, pens, etc. Ask the students (only the youngest one) the build a head for MI-GO and customize the spaceship.	
Prep	5'	Group	Introduce the Main block, which is the block where the "GO" button is. Introduce the move forward block and connect it to the Main. Click "GO" and watch the robot move 10 cm forward. It corresponds to 1 square on the scenario (grid).	
rep	5'	Group	Introduce the "Turn Left" and "Turn Right" blocks. Explain that the algorithm is built bottom-up, i.e., the first instruction to be executed is the one nearest to the Main block, followed by the second, third, ...	
Prep	5'	Group	Introduce the Number block. Explain that the function block will be repeated the number of times that we decide. Explain that the Number block is connected to the right of the instruction block.	

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Prep	5'	Group	Put a pen on MI-GO and ask the students to make a square with a side of 3. In the beginning, they could do it in parts, but the advanced student could try to represent the square at once	
Play	15'	Group	Hand out some Number and Function blocks. Let the students explore freely with the blocks and robot.	

Resources List & Support Material

Per each group:

- MI-GO robot kit;

- Transparent scenario with a 6x6 grid;

- Art material (playdoh, stickers, paper, scissors, pens, etc.);

- One pen for each robot.