

EARLY Teaching Scenario

Topic: Walking around with mTiny

Learning outcome:

Learning and strengthening the understanding of topological concepts (e.g. right/ left)

Development of abstract skills

Path-building in open spaces

Image and sound recognition

Recognition of facial expressions and emotions

Applying the 7 key competences



Skills pupils develop during the scenario (connect to curriculum →)(with reference to "Learning, the treasure within", UNESCO, 1996 and "Defining and Selecting Key Competences", OCDE, 1999):

- Thinking and learning to learn
- Taking care of others, managing daily activities, safety
- Multiliteracy
- Cultural competence, interaction and expression
- ICT competence
- Participation and influence in building a sustainable future

Target group: Kindergarten and primary school

Age of students: 4 to 7 years old

Number of pupils: Maximum of 20

Duration (estimated time/number of lessons): 4 x 1h

Prerequisites:

- [mTiny kit](#)
- Paper and cardboard and recycled materials
- markers
- scissors

Introduction to the scenario

This teaching scenario consists of a series of lessons dedicated to an introduction to robotics. As a starting point, we find some unplugged robotics activities, useful for strengthening the acquisition of topological concepts (e.g. right/left), the development of abstract skills, as well as the ability to visualize and build paths in open spaces. After these concepts are internalized and physically put into practice, mTiny kit is introduced with a series of more complex hand-to-hand programming activities, which will allow children to imagine and decide the sequence of the robot's movements in space through the use of a series of programming cards. The robot will move on scenarios that will be assembled and modified by the pupils themselves. Following this introduction phase, the scenario will focus on customization of the reactions and behaviors of the robot in relation to the different areas of the scenario which were previously built together. The teaching scenario will also include a more hands-on activity in which children will be invited to modify the robot's appearance and understand the relationship between these physical changes and the changes in behavior and reactions associated with each coding card.

risks and possible applications:

- The scenario can be used as a starting point for a wider activity to be developed in the classroom.
- the presence of a joystick on the remote control often leads children to prefer a remote robot driving to real programming with cardboard cards, it is necessary to present the real design process correctly and make it more interesting than simply moving the robot. It is also possible to let children experience the remote guide in the first phase and then propose the programming phase as an additional level of difficulty or a new challenge more complex than the previous one.

Before the program begins (preparatory work for teacher):

Charge mTiny

Set up the open space

Build a human-sized grid in which children can move around during the first lesson

Prepare directional cards on the mTiny programming card model

Main part of the scenario (n):

- lesson one:

The path is built using directional cards (example of cards in Figure 1). Obstacles are placed on the way and the children are invited to modify the path so that the child on the grid reaches the arrival point. Particular attention must be paid to the correct use of the programming cards as well as to verbalization and repetition of the right/left and forward/back concepts and the movements that correspond to these commands.

- lesson two:

Step 1: Introduction to the mTiny kit with an initial exploratory phase. Preparation of a simple path through the assembly of the puzzle pieces and explanation of how the programming cards work.

Step 2: Adding pieces to the path and propose a more complex challenge.

- lesson three:

Step 1: Construction of a new path and new challenge presentation.

Step 2: In the second phase of the lesson, once you have found the strip of code needed to make mTiny complete the chosen path, set aside some cards used, which are fundamental to this progression of the path, inviting the children to find alternative solutions with the cards they have left.

- **lesson four:**

Using the masks included as a model, each group builds a cat, dog or rooster mask with various materials and in total freedom. The class builds a new path which has to include the three tiles representing mTiny in the cat, dog and rooster versions as starting cards. Children experience the variation of the robot's behavior as it passes over the figures inside the path.



Learning outcomes

- Learning and memorizing topological concepts
- Development of abstract capacity
- Ability to imagine, walk and reconstruct paths in physical spaces
- Image and sound recognition
- Recognition of facial expressions and emotions
- Introduction to coding