Learning Scenario title

Stay on Track!

Educational level / Age group	**Elemantary school** **pupils aged 8 to 11 years**
AUTHOR: **School name:**	**Laurent Lanneau** **Ecole élémentaire S. Le Prestre Neuf-Brisach**
Country or region:	**France**

🎯 Learning objectives / aspirations

- To reinvest one's knowledge in programming
- Anticipate movements to construct a code
- Cooperate to achieve a common goal

🖋 Narrative overview

Following the discovery in groups of an activity booklet from the Matatalab kit, students take part in a cooperative challenge to reinvest what they have discovered.

This challenge allows all the pupils to be active and to anticipate the movements of the robot. The coloured tokens are shared between two teams. Each team must place them one after the other under the critical eye of observers who can intervene. The first objective for all is to avoid that the robot leaves the board. Once the code is complete, the two teams and the group of observers must place their flag on the square where they think the robot will stop without leaving the board.

Approach to teaching and learning

Approach to teaching and learning	Following the French NCRC curriculum, the activities in this learning scenario aim to promote collaborative learning, programming, solving of technical problems, abiliy to operate in a digital environment. Scientific domain: understand the functioning of a robot, learn to code, program algorithms Living language: related to the ability to participate in exchanges in various situations - practice the expected forms of discourse (describe, explain) - participate in an exchange
Approach to assessment	• Matatalab kit booklet to be completed in groups in preparation for a workshop during which students create a route using their learnings from the booklet. • Assessment is focused on students' ability to anticipate the path of the robot according to the code that they have constructed.

Roles

Teachers	Playmaker
Learners	Players
Others	X

Learning environment

- Students will work in groups. Activities are proposed in the form of a workshop, during which pupils will have to independently accomplish the activities described in the first booklet of the kit. They are therefore encouraged to solve problems in autonomy.
- When all groups have completed one booklet (the first one on the green tokens), the cooperative challenge is launched.
- Two teams of 3 students each will compete in front of the whole class. The spirit is collaborative without competition with active spectators.
- The game then becomes an important learning phase of the coding sequence. It allows the skills that the pupils have developed as a group to be reinvested and to be reinforced collectively.
- All pupils participate and try to achieve the same objective.
- The following sessions follow the same procedure: first students discover new tokens by using notebooks and then they take part in a challenge working in teams (alternating teams).

Learning activities

Rules of the game:
The aim is to build a code for the robot without it leaving the board.

- At the beginning of the game, the mobile robot is randomly placed on the board by a student from the class.
- Each team receives half of the tokens, with a maximum of 12 tokens per team. Students play first with the green tokens; later other colours will be added as students get familiar with the material and the different tokens. The tokens are visible to all.
- Each team takes turns placing a token on the track. Each group is obliged to place a token.
- The game ends when there are no more tokens or when the whole track is filled.
- When the mobile robot is launched, if the coding makes it leave the board, the challenge is lost.
- Each team is responsible for choosing a token so that the robot does not leave the board. Students must also anticipate the moves that the other team will make. When choosing their token, students must consider the other team's tokens so that the other team does not risk making the robot go off track.
- Students can discuss within their team but never exchange with the other team.
- Each time a token is placed, a pupil from the class plays the role of observer: he/she is not in a team and can observe and intervene to make the teams aware of a possible risk for the robot to go off track.
- When an observer intervenes, there is collective negotiation but no exchange in the teams: only the observers can discuss and not the teams. During the negotiation, the

observers discuss the pupils' proposal, but the teams cannot talk or explain their strategy.
- Following the exchange between the observers, the teams can decide whether to change or maintain their strategy.
- The game goes on until all tokens are placed, even if the teams know they are going to lose.
- Each team is given a flag that they can place on the square where they think the vehicle robot will stop. They can even point the flag in the direction they think the vehicle robot will look. The observers can discuss placing the third flag together. After the robot is launched, it is checked whether the cooperation has worked.

Possible challenges

The following variations can make the game more challenging for students:
- Add more tokens.
- Have the children choose 12 tokens.
- Do not allow one chip to be placed after another.
- Limit the time for reflection with a stopwatch.
- Impose a blank on the empty square and ask a pupil appointed at the start to place a token chosen from the remaining tokens. Alternatively, a token can be picked randomly before the game starts and placed in the blank at the end.

Resources

Matatalab Coding kit

Literature to support

https://www.gse.harvard.edu/news/uk/19/03/playing-learn

Autonomous discovery sessions during the workshops

(Pictures by Laurent Lanneau, FCL France, parental permission granted)

Whole class cooperative challenge session

(Pictures by Laurent Lanneau, FCL France, parental permission granted)