

Brain Twister



Interacting with robots will become common in the future. To speak to a machine you need to give very clear orders. This game will train you to give clear orders to a machine using only numbers and directions. Children explore computer commanding while doing physical activities and have fun!

Printable resources attached: Board and pawns to print.

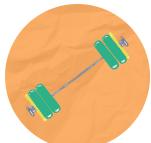
Additional material needed: Something to create a table on the ground: tape, chalk, tiled floor, string, etc.

Onboarding - Welcome to the Unplugged Universe



From 10 minutes to an hour

Learning objectives



Acquiring methods and tools through physical exercise and sport



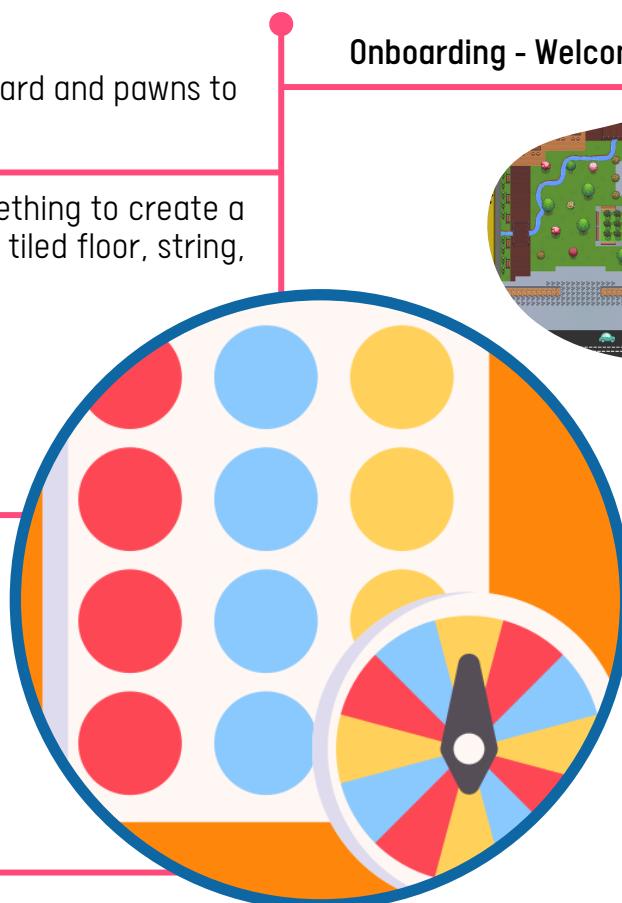
Modeling



Identifying oneself in space and time



Developing my motor skills and learning to express myself using my body



Linked SDGs



Game modalities

9 - 12 years old

In group

In the classroom

Support of an adult

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Pedagogical interest and topics targeted

Topic 1 - Understanding computer logic: Programming is becoming a core skill for the youth. When programming, you should be very clear in the instructions you will give to the computer. In this game, children learn to give and perform commands without using a computer. Performing physical exercises in giving and receiving simple orders also enhances children's spatial orientation. Children move around the table implementing orders about directions and body parts (e.g. left hand, right leg, etc.)

Topic 2 - Geometry and mathematics: This game is about putting things in their right place on a table. Like an engineer, you will need to be very precise to win. You will need to focus despite the fact that it's a competition and you are playing with your classmates. The Brain Twister game improves children's spatial references and their ability to reproduce a figure on a table as seen in the school programs.

Topic 3 - Expression: In this game, it is important to orally express yourself in a clear manner. If instructions are not detailed and yet clear enough, this will influence the success of the game. The game also teaches to control the tone of your voice, its speed, your diction, and the words which are used to give the best orders to your robots (other classmates).





Game rules

Game narrative: In the future, humans have been replaced by robots to do factory work. The game takes place in a nuclear power station. The factory's crew is made only of robots. The robot commander accidentally ran out of power and no one else knows how to control the crew. We need your help! Learn how to interact with robots and give them clear orders to make sure the factory's crew don't do mistakes and to avoid ecological disaster.

Because they didn't receive the right orders, all the robots are mixed up. The robot commander used a board *game object 1* to give instructions to the robots. Refer to the board used to bring each robot back to its right place.

Role of the teacher and game organisation: The teacher draws two tables on the ground with the same number of cells as the ones on the board *game object 1*. The tables' size can be reduced according to the number of players. *Tips; use floor tiles as cells!*

Before the game starts, the teacher uses the pawns *game object 2* to create a figure on the board *game object 1*.

According to the level of difficulty (described below), the teacher can use the pawns of sheet 1 or sheet 2.

At the beginning of the game, the teacher chooses two-game leaders. The game leaders change each round.

Game rules: Two players are the game leaders, one for each team. The game leaders give instructions to the robots to reproduce a figure that the teachers have prepositioned on board game object 1. The other players are the robots. They are called by their own names.

To win the game, a game leader needs to place the robots correctly on the table (on the ground) to match the figure on the board game object 1, by giving orders to the robots to place them in the right cells. An order should be made as follows: e.g. **Name of the Robot (e.g. Martin) - move 3 cells left; Name of the Robot (e.g. Emma) - move 2 cells forward; Name of the Robot (e.g. Victor) - Put your hands on the cell on your left.**

When a game leader decides that the figure is reproduced, the game ends for both teams. The teacher compares the positions of the robots of each team with the board game and reckons which team has successfully completed the task.

The activity is followed by a discussion over strategies each team leader used to give orders. In the next round, teams may reconsider these strategies to implement just learnt good practices. As a final step, children may discuss together how their physical activity could contribute also to energy production to activate a computer, for example. Digital devices and applications may be used to record the level of energy produced or teachers may decide to stay unplugged and demonstrate energy production through movement by lightening a hand-powered torch or a dynamo of a bike.

Additional activity may be having a discussion about a healthy lifestyle and the importance of movement.

To add challenge, let's look at difficulty levels 2 and 3 described on the next page.

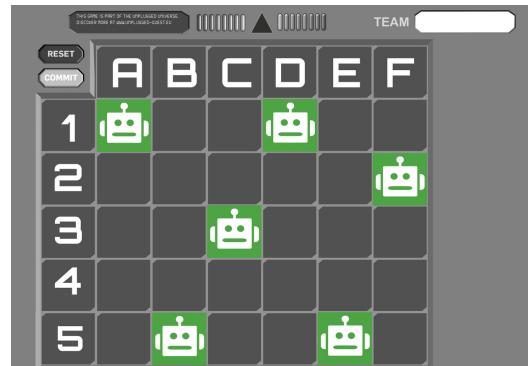




Game rounds

Round 1 - Difficulty: Low

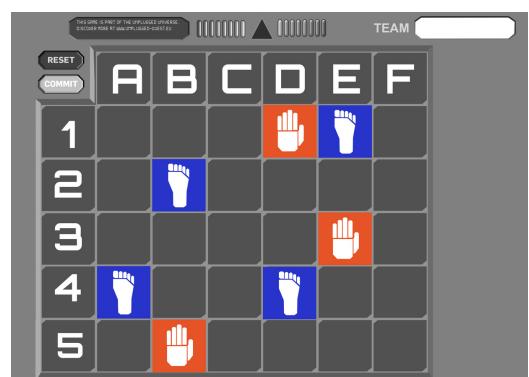
If using the robots pawns (green) the game leader needs to place the robots on the right cells. The game leader gives orders to the robots until time has run out. The game stops when one of the team leaders completed the figure and calls the teacher. In this example, the game is played with six robots. To win the game, the leader has to reproduce this figure with the real robots (his classmates). The robots need to stand on A1, D1, F2, C3, B5, and E5.



Round 2 - Difficulty: medium

If using the hand/foot pawn, the game leader needs to place the hands and feet of the robots on the right cells. A robot can put both of his hands/feet on a single cell if needed. When one of the leaders completes the figure he calls the teacher and the game stops for both teams.

In this example, the game is played with two robots. To win the game, the leader has to reproduce this figure with the real robots. The hands of the robots need to be on D1, E3, and B5 and the feet on B2, A4, D4, and E1.



Round 3 - Difficulty: High

Instead of having to reproduce a specific template, **children are asked to reproduce geometric forms**. For example, draw a square of 3 by 3 cells with 8 players. Elder kids can be asked to **reproduce a figure from a given area**. For example, draw a figure with an area of 10 squares with 8 players.



Going further



Topic 1 - Approach programming

Programming is becoming a valuable skill. More and more websites offer playful ways to learn how to code. To further practice programming in class you may wish to refer to:

- Other Unplugged quests such as *Memory*, *Peace Magic Grid*, *Binary Counting*, *Programming a Choreography*
- Programming tools adapted to young audiences such as Scratch: <https://scratch.mit.edu/>, Code.org: <https://code.org/> and Code Combat: <https://codecombat.com/>



Topic 2 - Work with images/drawings

Visualise and reproduce the images of the given link on a 10x10 table: <https://www.pinterest.fr/pin/18999629663311867/>

To further educate working with images you may wish to refer to other Unplugged quests, e.g. *Form Factor*, *Fantasy out there!*, *Good Ways*



Topic 3 - Express clearly and effectively

Try to speak to a virtual assistant on a phone or a computer. You will need to separate your words and master your tone for the machine to understand what you are saying. **Diction** is important when speaking to robots but also when speaking with humans. If you want to improve your diction, try to record yourself and identify the areas of improvement you can work on. Should you speak slower, should you separate your words more, etc. To further practice oral expression you may wish to refer other Unplugged quests, such as *Pop-up City of the Future*, *The Perfect City*, *Farm in the City*, *Brainstorming*, etc.

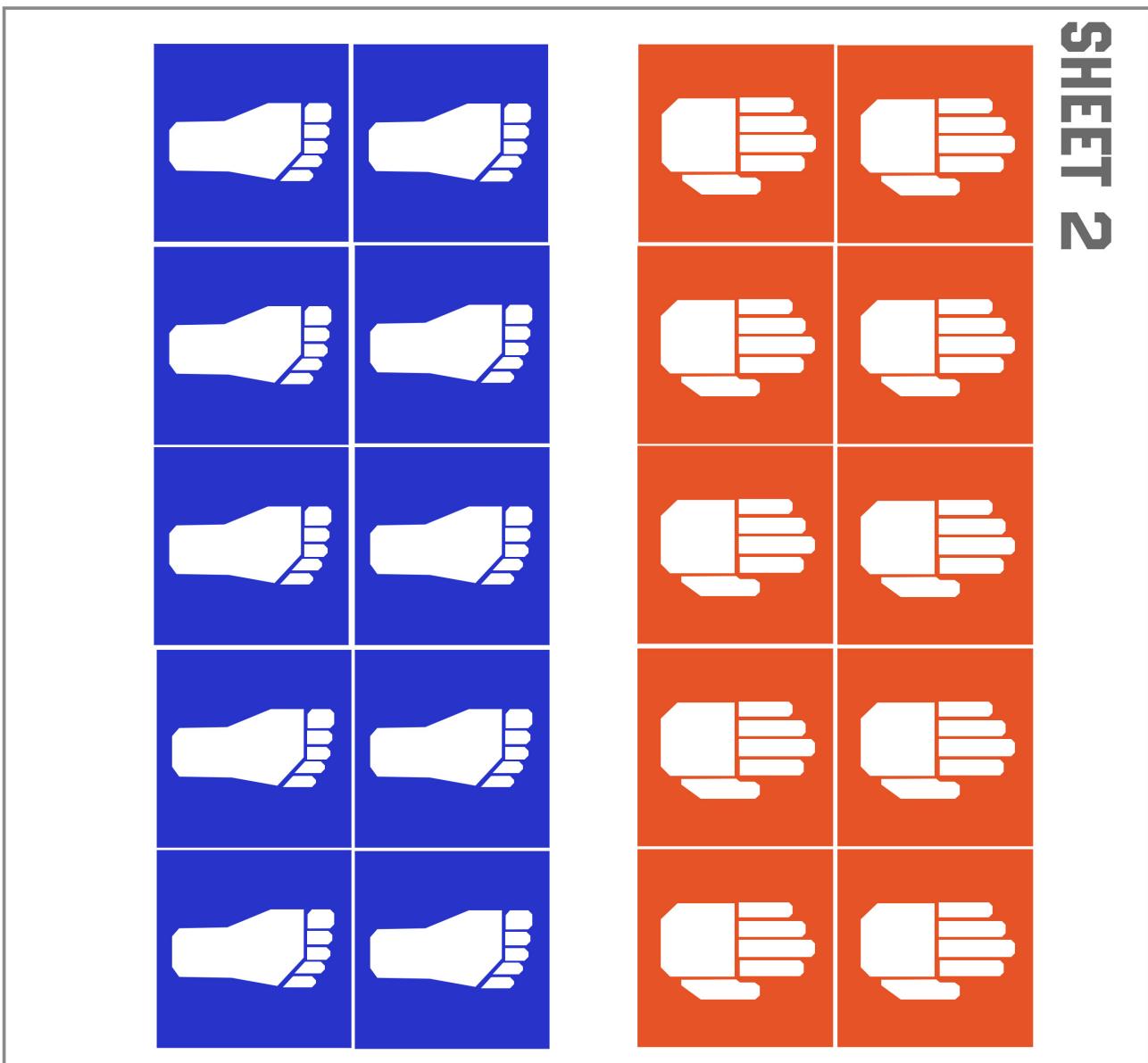
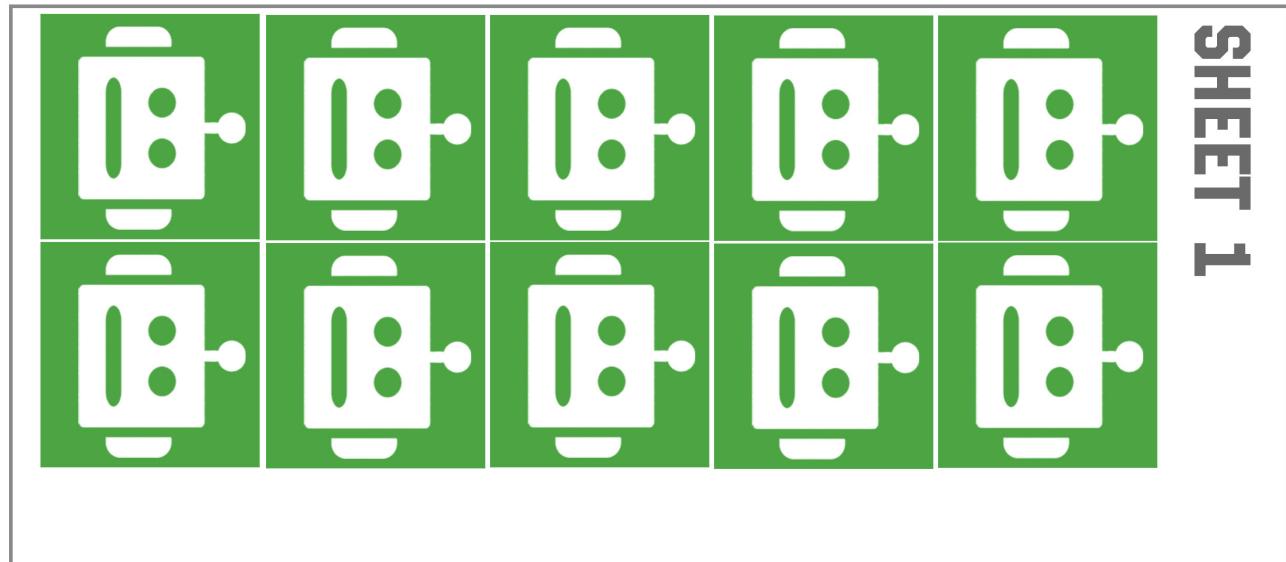


Topic 4 - Discussing chosen strategies

- Other Unplugged games - *Farm in the City*, *Reroute better world*, *The Perfect City*, etc.
- Teaching children about the environment in theory and experiments: https://www.kindergarten-lessons.com/environmental_education_for_kids/
- Facts about the environment for children: <http://gogreencyclopedia.blogspot.com/2013/09/50-facts-about-your-environment-for-kids.html>
- Learn about clean energy: <https://energync.org/forkids/>
- More ideas about movement games: <https://earlyimpactlearning.com/mindful-movement-for-kids-14-games-tips/>



Printables





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The logo for WPS Office, featuring a stylized 'W' inside a shield-like shape.

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