Unplugged Activity

Title: RECYCLEBOT 4.0 INTO ACTION.

Educational level 2º Cycle of Primary Education.
Curricular areas: Social Studies.
Timing: one session, any term.

Summary

In this activity, students will work on their environmental awareness while reviewing content related to recycling and waste classification.

To clean the countryside, they will have to write a code that programs the robot to collect the different waste and take it to the appropriate container. The activity is proposed graded in three different levels.

Aims

- Understand the importance of caring for the environment.
- Become familiar with the different types of waste.
- Classify waste in the different containers.
- Design algorithms to develop a specific task.

Key competencies to develop: personal, social and learning to learn competence, citizenship competence, mathematical competence and competence in science, technology and engineering.

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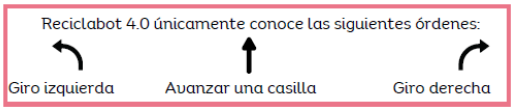
Ho do we do it?

1. We will begin by performing the **LEVEL 1** challenge, in which Recyclebot 4.0 must clean the field of waste and take it to the appropriate container. To do this, the students must write a code that allows the robot to move around the board and collect all the waste before reaching the container. In this level, all the waste that appears is of the same type.

2. It is very important to emphasize that Recyclebot 4.0 can only move according to specific commands and therefore these are the only ones that must appear in the code. We must always pay attention to where the robot's eyes are looking to determine the direction of rotation or forward move.



In the box provided for writing the code, the “pick up residue” actions are given to guide the path that the robot should follow.

3. The **Helpers** file is included with small cut-out robots to hand out to students in case they need extra help with spatial orientation. It will help them to be able to move and rotate it around their board while writing the code.

4. In the file **Debugging Sheets**, we will find the board in a larger size, as well as a board for writing the code and a larger cutout robot. We will use these materials when we finish the activity to check the solution together, but they can also be used to demonstrate how the robot moves or if we want to do the activity as a whole group.

5. During the checking process, after writing the code proposed by the students, the teacher can drive the robot on the board, thus initiating a debugging process in which the code is reviewed step by step to detect possible errors.

6. The **LEVEL 2** challenge includes several different types of waste, but Recyclebot 4.0 must only collect those that go into the yellow container. This initiates a process of abstraction in which the student must ignore the elements that are not relevant to focus only on those that are essential to carry out the task. At this level, the orders to “pick up waste” are also provided.

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7. The **LEVEL 100** challenge involves a significantly higher difficulty, since it includes five types of waste that occupy the entire board and whose classification will require from us greater skills of abstraction and decomposition. You will have to select a container to take all the corresponding waste to it, following a route of your choice, since in this case there are no waste collection orders to guide you. This challenge, being more open-ended, does not come with a solution as there are multiple valid solutions.

Suggestions

The three levels proposed for this activity allow us to use it in different ways:

- Adapted to different levels of competence within the classroom.
- Vary the groupings: perform Level 1 individually, Level 2 in pairs and Level 100 in groups.
- Perform each challenge in a different session.

Recursos

- **Human:** teacher and students.
- **Material:** level 1, 2 and 100 challenges, robot helpers, debugging sheets, pencils, scissors.

Space: classroom.

Type of activity: individual / pairs /whole class.

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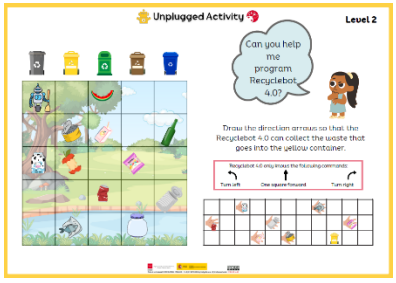
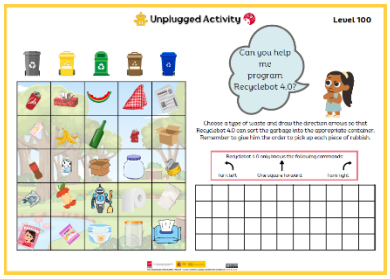
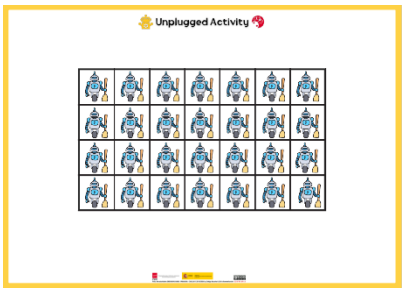
Level 1



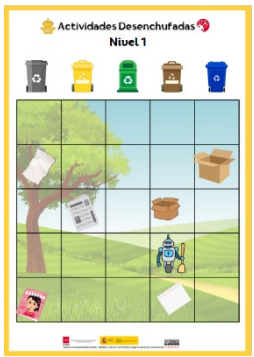
Level 2



Level 100



Helpers



Debugging sheets

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¿Qué hemos aprendido?

Assessment criteria	4 Excellent	3 Very good	2 Satisfactory	1 Needs improvement
Understand the importance of caring for the environment.	Clearly explains the importance of caring for the environment and proposes practical solutions.	Recognizes the importance of the environment and mentions some actions to take care of it, but without going too deep.	Has a limited understanding of the importance of caring for the environment, mentioning some actions without much clarity.	Does not have a good understanding of the importance of caring for the environment or shows confused ideas about it.
Becomes familiar with the different types of waste.	Correctly identifies all types of waste and differentiates their characteristics.	Recognizes the different types of waste and can classify them correctly in most cases, although there are some inaccuracies or lack of details.	Recognizes some types of waste, but presents confusion when classifying them or cannot describe their characteristics accurately.	Does not correctly identify the types of waste or their characteristics, or classifies them incorrectly.
Sorting waste into different containers.	Sorts all waste correctly into the appropriate containers without error.	Sorts most waste correctly, although makes some minor errors in some cases.	Makes frequent errors when sorting waste, although occasionally gets it right.	Does not sort waste correctly or does not know which container it should go in.
Design algorithms to develop a specific task.	Design a clear, precise and detailed algorithm, following a logical and orderly sequence.	Designs a functional algorithm, but with some confusing details or unclear steps.	Designs an incomplete algorithm or one with errors, making it difficult to execute the task.	Does not design a clear algorithm, or the sequence is disordered or inconsistent.

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Computational thinking

Logic (prediction and analysis): thinking to make predictions, solve problems and make decisions based on available information.

Algorithms (steps and rules): is a step-by-step process that solves a problem or completes a task.

Decomposition (breaking down into smaller parts): breaking down problems into smaller and more manageable parts, which are easier to understand and solve.

Abstraction (delete unnecessary details): simplifying things in a problem hiding unnecessary details or aspects to focus on those which are relevant and essential

More information

QR codes to the activity resources:

Level 1 | Level 2 | Level 100 | Helpers | Debugging sheets

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