

Learning Scenario title

Let's help "Curly Hair"

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| Educational level / Age group | Preschool and first 4 years of elementary school |
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| Country or region: | Portugal |

Learning objectives / aspirations

1. Explore the "Golden Curly Hairs" story (reading and oral interpretation) and retell it.
2. Conceive and apply strategies to solve problems with natural numbers, in mathematical and non-mathematical contexts, and assess the plausibility of the results.
3. Express mathematical ideas orally and in writing, and explain reasoning, procedures, conclusions.
4. Identify and understand the use of digital and its potential in understanding the world around them.
5. Foster collaborative work through activities carried out in small groups.
6. Promote logical reasoning, critical thinking and computational thinking.

Narrative overview

After listening to the "Golden Curly Hairs" story, the students, together with the teachers, draw the characters and the different scenarios of the story and create a map. Then, each group programs the robot to follow through the various stages of the story, overcoming the obstacles placed on the map. The groups receive cards with challenges, some of them mathematical, that lead them to the drawings and numbers on the map. As a group, they will keep programming the robot until the goal is fulfilled.



Approach to teaching and learning

Approach to teaching and learning (working methodology)

The aim was to actively engage students in the activities, through their individual work (listening and retelling the story) but also regarding their contribution to the work group (designing and building the characters and programming the robot). Another purpose was to promote collaborative learning, by experimenting and reflecting on the mistakes. Besides being an interdisciplinary activity, since it involves competences of different subjects, the use of cards with challenges is aligned with problem-based learning (PBL).

Approach to assessment (as the endorsement was carried out: rubrics...)

The assessment was based on the work carried out by the students, either individually or in the large group, in a formative and knowledge building perspective. Furthermore, at the beginning of the activity, an assessment rubric, that drove the development of all the work to be done, was presented to the students, and discussed with them.



Roles (role of different actors in the activity)

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| Teachers | The teacher was the facilitator of the learning processes, stimulating reflection and discussion on the topics covered. More than conveying knowledge, the teacher planned the tasks and encouraged students' involvement in learning, by solving problems and decomposing large problems into smaller parts, making small balances and providing feedback. |
| Learners | Students were actively involved in the whole process, building their own knowledge through the interaction with others. In the group tasks, the students played different roles: programmer; verifier; performer; final verifier. The individual actions were monitored by all the elements of the group. When facing an error, the students, in groups, reviewed the procedures and discovered new solutions to solve the problems that were posed to them. |



Learning environment

The activity took place in the classroom, according to different dynamics. In the first part, the class explored the story: the students interpreted it, answered a few questions orally and were asked to retell the story. In the second part, working in small groups of 4 students, they programmed the robots to solve the problems suggested by the teacher, using the map that themselves had created.



Learning activities

1. The students watch "Golden Curly Hairs" animation.
2. They draw the character "Curly Hairs", the bowls (small, medium, large), the chairs (small, medium, large), the beds (small, medium, large) and then the map of the story.
3. They are grouped into teams.
4. Each team is given a sheet with the tasks and instructions on how to program the robot. Firstly, the team must write down the programming, while discussing the solutions.
5. Whenever a team performs a task accurately, with no mistakes, it earns 2 points. One point is subtracted if one or more steps happen to be wrong. In the end, the points are

added up and the winner is the team that scored the highest. That is to say, the winner team is the one that performed every task, from beginning to end, with fewer mistakes.



Possible challenges (possible challenges for those who will experience the activity)

1. Laterality issues in younger children.
2. Discussing and implementing assessment rubrics with younger children.
3. Writing down the algorithms and being able to identify and correct the errors.



Resources (resources used)

The resources used in the activities were:

- "Golden Curly Hairs" movie.
- 1 map built by the teacher and the students, with the characters of the story and the different scenarios.
- MATATALAB ROBOTS (Tale Bot and Coding Set).
- 3D artefacts (Curly Hairs, bowls, chairs, beds).
- Sheets with the challenges:

Na floresta, o urso pequeno e a Caracolinhos foram jogar ao TIRO AO ALVO. Estas foram as suas pontuações:

Leva o Robô até à personagem que ganhou o jogo.

- Worksheets to write down the algorithms and assign the tasks:



Programando com a Caracolinhos Dourados



Nome do grupo:

Regista a tua programação:

- Assessment rubrics.



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