Learning Scenario title

"Solid Figures"

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

Learning objectives / aspirations

1. Identify and compare solid figures, recognizing similarities and differences and identifying the flat shapes on their sides/bases: polygons (triangles, squares, rectangles) and circles.
2. Identify the properties of flat figures and solid figures and explain the criteria used to classify them.
3. Strengthen the confidence in their own mathematical skills and knowledge; promote the ability to analyze their own work and to self-regulate their own learning.
4. Conceive and apply strategies to solve problems with natural numbers, in mathematical and non-mathematical contexts, and assess the plausibility of the results.
5. Express mathematical ideas orally and in writing, and explain reasoning, procedures, conclusions.
6. Identify and understand the use of digital and its potential in understanding the world around them.
7. Foster collaborative work through activities carried out in small groups.
8. Promote logical reasoning, critical thinking and computational thinking.

✒️ Narrative overview

Following a review approach to solid figures and their characteristics, students build the solids with the nets that the teacher gives them. Afterwards, they place the solids on a transparent map and remove one card with the description of a solid. Once they have identified the solid by using the given clues on the card, the activity can start: each group must program the robot to reach the solid, overcoming the obstacles placed 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 is to actively engage students in the activities, through their individual work (building the solids) but also with regards to the development of all the activities that followed. Another purpose is 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 endorsementwas carried out: rubrics...)	The assessment can be based on the work carried out by the students, either individually or in the large group, in a formative and knowledge building perspective. The errors that occur can be subjected to discussion and analysis, both by the students and the teacher, to foster learning self-regulation.

Roles (role of different actors in the activity)

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

Learning environment

The activity can take place in the classroom, according to different dynamics. In the first part, each pair of students is given a net to build a solid. In the second part, working in small groups of 4 to 6 students, they program the robots to solve the problems suggested by the teacher, using the transparent map with the solids on top of it.

Learning activities

1. Working in pairs, the students build the solids with the nets provided by the teacher:

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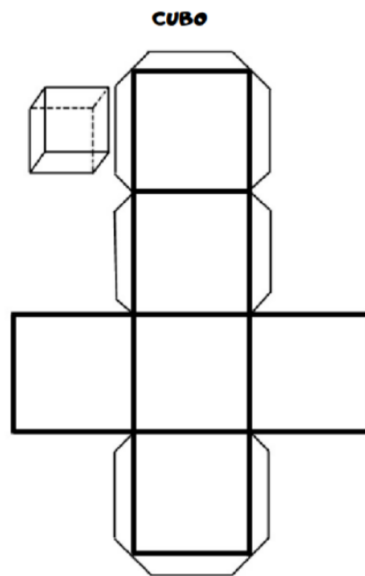
2. Then, students are divided into groups (accordingly to the teacher's indications, but it can be discussed with them).
3. Each group places the solids on the transparent map and takes out a card.
4. One of the elements reads the clues on the card and together they identify the solid in question.
5. Now, the group must program the robot to reach the solid.
6. After reaching the right solid, the group receives another card with a new challenge.
7. The winner is the group that reaches the right solid more often in lesser attempts.

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

1. Laterality issues in younger children.
2. Writing down the algorithms and being able to identify and correct the errors.

📦Resources (resources used)

The resources used in the activities were the following:

- Nets for geometric solids.
- 1 transparent map.
- Cards describing the solid figures.

- Worksheets to write down the algorithms and assign the tasks to the elements of the group (programmer, verifier, executer, final verifier):

PROJETO MATATALAB

Nome do grupo:			
Programador	Verificador	Executante	Verificador final

Aqui podes escrever a programação no papel para depois ser verificada por outro colega.