Unplugged Activity

Title: I´LL MAKE SURE TO KEEP IT STEADY

Educational level: First Cycle of Primary Education.
Curricular areas: Natural Science.
Timing: one or two 45 minute sessions (in any term).

Summary

In this activity, they will engage in developing professions, such as builder and architect, infused with computational thinking.

Aims

- Work in pairs, effectively performing the assigned role.
- Associate the building blocks with the given code.
- Apply the code to translate the created structure.
- Use the concepts learned.

Key competencies to develop: linguistic communication, mathematical competence and scientific, technological and engineering skills, and entrepreneurial skills.

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How do we do it?

1. **Preparation:** In a spacious area that allows work on the floor, pre-cut cardboard pieces the size of A6 or smaller are distributed to make the cards.
2. **Development:** Students are organized in pairs, and each pair is given a set of building blocks and a set of five cards to prepare, along with the coding key. One card will be labeled “start,” another “type A piece,” as indicated in the resources section. Each member of the pair will have a different role: one will be the builder (starting to use the building blocks), and the other will be the architect (responsible for creating the plans for the construction).
3. According to the code, the “start” card will represent all wooden pieces; the “type A piece” card will represent rectangular prisms of any color. In this way, the builder will complete the creation, and the architect, after analysing the builder's construction, will initiate the sequence of cards. Taking into account the start and the end, the architect will label each piece as type A, B, or C, depending on the blocks placed by the builder. At the end, they will switch roles.
4. Once the task is completed, the students will gather as a whole group to discuss what each role accomplished, and the teacher will introduce terminology (algorithm and decomposition).
5. **Conclusion:** In pairs, students will share with the whole group, aiming to use the concepts previously explained.

Suggestions

In a later session, the task can be revisited to perform it in reverse order: the architect designs a structure, and the builder brings it to life with the building blocks.

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Resources

- **Human:** teaching staff**.**
- **Material:** building blocks, card paper, markers, and a carpet to dampen noise.

Space: a large area to work on the floor.

Type of activity: in a large group and in pairs.

Coding code:

- **Starting Piece:** Any wood color.
- **TYPE A Pieces:** Thick square prism (red, blue, yellow, green).
- **TYPE B Pieces:** Thin square prism (red, blue, yellow, green).
- **TYPE C Pieces:** Bridge-shaped (red, blue, yellow, green).
- **Ending Piece:** Triangular prism.

Examples:

TYPE A Thick quadrangular prism	**TYPE B** Thin quadrangular prism	**TYPE C** Bridge shape

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What have we learned?

Here is the rubric for the activity:

Assessment Criteria	4 Excellent	3 Very good	2 Satisfactory	1 Needs improvement
Perform each role	Actively and consistently participates in their assigned role, fulfilling responsibilities with initiative, accuracy, and creativity.	Performs their assigned role responsibly and efficiently, completing tasks and participating in team activities in a timely manner.	Meets their role in a basic manner, completing assigned tasks, but their participation is occasional or requires external motivation.	Does not adequately fulfill the tasks of their role, participating minimally or frequently deviating from their responsibilities.
Associate the blocks with the given code.	Identifies and correctly associates all the blocks.	Associates most of the blocks with the given code correctly, with minimal inaccuracies.	Associates some blocks with the given code, but with errors or hesitations in interpretation.	Presents frequent errors in associating blocks with the given code, showing little to no understanding of the structure.
Apply the coding cards.	Applies all the coding cards accurately and appropriately.	Applies most of the coding cards correctly, with few minor errors.	Applies some coding cards correctly, but presents several errors or misunderstandings.	Has difficulty applying the coding cards and makes frequent errors.
Utilise the concepts learned.	Utilises the learned concepts accurately and thoroughly, integrating them into their work with depth and creativity.	Utilises most of the learned concepts appropriately, with few errors.	Utilises some learned concepts but demonstrates partial or limited understanding, making occasional errors.	Demonstrates difficulty using the learned concepts appropriately, applying them incorrectly or incompletely.

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Computational Thinking

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.

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