Unplugged Activity

Title: Organising the Digital Revolution

Educational level: **Third cycle of Primary Education.**
Curricular areas: **Natural Science.**
Timing: **45 minutes (in any term).**

Summary

In this activity, students will be paired up and will have to order the main milestones of the digital revolution as if they were a computer, using a sorting algorithm, the simplest one: bubble sort.

Aims

- To introduce the main milestones of the Digital Revolution.
- To understand how computers work.
- To know how to use the bubble sort algorithm.
- To work as a team.

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Unplugged Activity

Key competencies to develop: mathematical, digital, linguistic communication, learning to learn, entrepreneurship, social and civic skills.

How do we do it?

1. **Introduction**: Present the main milestones of the Digital Revolution using the "Milestones of the Digital Revolution" sheet, explaining the key events from the invention of the integrated circuit to the latest advancements.
2. **Algorithm Explanation**: Remind students what an algorithm is, and explain the bubble sort algorithm using the "Sorting with the Bubble Sort Algorithm" sheet.
3. **Pair Work**: Organize students into pairs.
4. **Practice Sorting**: Distribute the 4 cards shown in the video to each pair and ask them to arrange them randomly and then sort them using the bubble sort algorithm. They can start by arranging the cards as shown in the video and follow the steps to sort them.
5. **Main Activity**: Collect the algorithm cards and distribute the cards with the milestones of the Digital Revolution.
6. **Sorting Activity**: Students should order the milestones of the Digital Revolution using the bubble sort algorithm. They must record in their notebook the initial position of the cards and the changes made at each step.
7. **Discussion**: Review the results, examining the order of the milestones. The teacher should reflect with the class on what an algorithm is, the difference between how they would sort the cards versus why computers need defined steps, and the advantages and disadvantages of the bubble sort algorithm.

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Suggestions

- Change the groupings to work in threes or fours.
- Use a deck of cards to practice the sorting algorithm.
- Add or remove cards to adjust the difficulty of the exercise.

Resources

- **Human:** teacher and students.
- **Material:** Cards with the milestones to be sorted, presentation explaining the sorting method, cards to explain the bubble sort method

Space: Classroom.

Type of activity: Whole group and pairs.

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Milestones of the Digital Revolution:

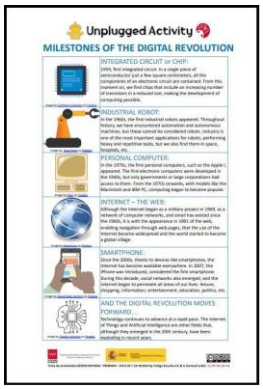
[Milestones of the Digital Revolution Sheet](#).

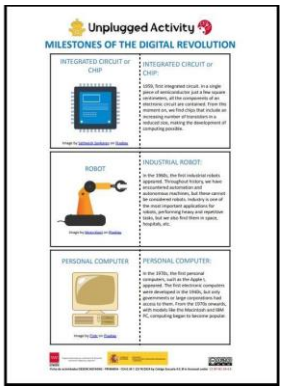
[Cards with the Milestones of the Digital Revolution](#).

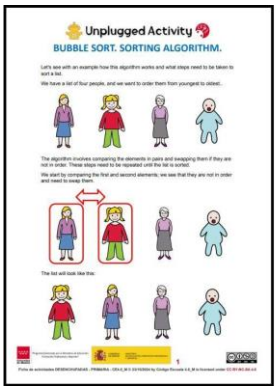
Bubble Sort Algorithm:

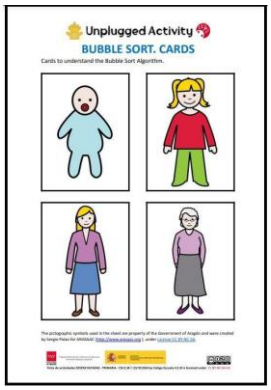
[Explanation sheet](#).

[Cards from the sheet](#).









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What have we learned?

Below is the rubric for the activity:

Assessment Criteria	4 Excellent	3 Very good	2 Satisfactory	1 Needs improvement
Understanding the Bubble Sort Algorithm and being able to sort a list.	Understands the activity and efficiently sorts any list.	Understands the activity and sorts at least the example list.	Understands the activity but does not complete sorting a list.	Cannot sort a list and does not understand the algorithm.
Understanding what an Algorithm is.	Understands what an algorithm is and can explain it with examples.	Understands what an algorithm is but cannot explain it.	Partially understands what an algorithm is.	Does not understand what an algorithm is.
Knowing and chronologically ordering the main milestones of the Digital Revolution.	Knows and orders all milestones of the Digital Revolution.	Knows and orders most milestones of the Digital Revolution.	Knows and orders some milestones of the Digital Revolution.	Does not know or does not order most milestones of the Digital Revolution.
Teamwork, collaboration and communication.	Works in a team in an organized and positive manner.	Works in a team but has communication problems.	Tasks are distributed in the group.	Does not work in a team.

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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:

Milestones of the Digital Revolution Sheet

Cards with the Milestones of the Digital Revolution

Bubble Sort Algorithm: Explanation sheet.

Bubble Sort: Cards from the explanation sheet

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