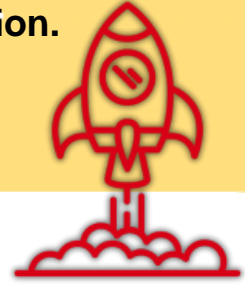


Title: Organising the Digital Revolution

Educational level: Third cycle of Primary Education.

Curricular areas: Natural Science.

Timing: 45 minutes (in any term).



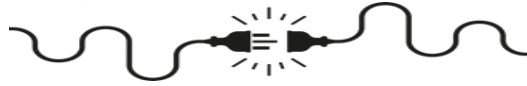
Summary

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.



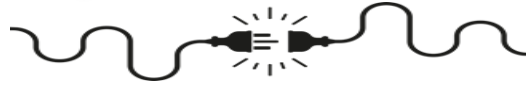
Key competencies to develop: mathematical, digital, linguistic communication, learning to learn, entrepreneurship, social and civic skills.



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.





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.



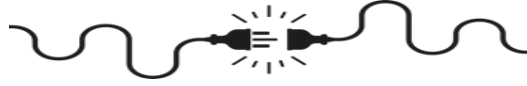
Resources

- **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.



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.](#)

Unplugged Activity

MILESTONES OF THE DIGITAL REVOLUTION

INTEGRATED CIRCUIT or CHIP:
In the 1970s, the integrated circuit (IC) revolutionized the computer industry. It allowed for the miniaturization of electronic components, making computers smaller, faster, and more powerful. This led to the development of personal computers and mobile devices.

INDUSTRIAL ROBOT:
In the 1960s, the first industrial robot appeared. Through the 1970s, we have seen significant advances in robot technology. Today, we have industrial robots in factories and service robots in hospitals and homes. These robots are used for a wide range of tasks, from manufacturing to healthcare.

PERSONAL COMPUTER:
In the 1970s, the first personal computers, such as the Apple II, appeared. The first electronic computers were developed in the 1940s. In the 1950s, the first personal computer was developed. The first personal computer was the Altair 8800, which was developed in 1975.

INTERNET - THE WEB:
The first website was created in 1990. The first web browser was developed in 1991. The first web page was created in 1991. The first web browser was developed in 1991. The first web page was created in 1991.

SMARTPHONE:
The first smartphone was developed in 2007. The first smartphone was the iPhone. The first smartphone was developed in 2007. The first smartphone was the iPhone.

AND THE DIGITAL REVOLUTION MOVES FORWARD:
Technology and innovation are driving the digital revolution forward. The future of technology and innovation is bright. The future of technology and innovation is bright.

Unplugged Activity

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Unplugged Activity

BUBBLE SORT, SORTING ALGORITHM.

Let's see with an example how the algorithm works and what steps need to be taken to sort a list.

We have a list of four people, and we want to order them from youngest to oldest.

The algorithm compares the elements in pairs and swaps them if they are not in order. These steps need to be repeated until the list is sorted.

We start by comparing the first and second elements, we see that they are not in order and need to be swapped.

The list will look like this:

Unplugged Activity

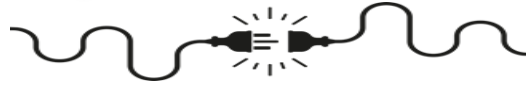
BUBBLE SORT, SORTING ALGORITHM.

Cards to understand the Bubble Sort Algorithm.

The algorithm compares the elements in pairs and swaps them if they are not in order. These steps need to be repeated until the list is sorted.

We start by comparing the first and second elements, we see that they are not in order and need to be swapped.

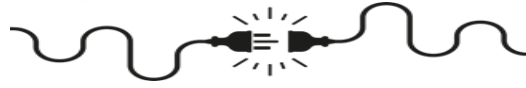
The list will look like this:



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.



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