



## TITLE: Getting Started with NAO Robot Programming

### LEARNING SCENARIO

<i>School: Mangualde School Group</i>		<i>Duration (minutes): 135</i>
<i>Teacher:</i>	<i>Cristina Ligeiro Manuel Figueiredo, Paula Loureiro, Renato Castro</i>	<i>Students age: 14</i>

#### Essential Question:

What can NAO do? How?

#### Topics:

- Programming robots
- Computational thinking
- Blocks programming language

#### Aims:

- Motivate and familiarize students with NAO programming using Choregraphe
- Understanding the four steps of Computational Thinking: decomposition , pattern recognition , abstraction and algorithms

#### Outcomes:

- Main features of NAO
- Essential concepts in the Choregraphe application
- Organization of Choregraphe programming blocks in to thematic folders
- Using a Choregraphe application
- Use of Choregraphe's essential programming blocks
- Carry out a short programming of a few blocks
- Load the application for NAO behavior

#### Work forms:

- Individual work
- Work in pairs

#### Methods:

- *Short presentations*
- *Talks and discussions*
- *Interactive exercise /simulation on the computer*

### ARTICULATION

Course of action (duration, minutes)



## INTRODUCTION

This lesson should contribute to the development of digital skills, more specifically in logical, critical, and computational thinking.

It begins by showing students the importance of programming and how computational thinking is structured. After a brief presentation and familiarization with NAO robot, the teacher presents the first steps to program NAO with Choregraphe and proposes to the students to develop a small programming work.

The work must be developed collaboratively, also leading students to develop skills to organize and regulate their learning, both individually and in groups.

## MAIN PART

### Topics for discussion

- The importance of programming
- Knowing NAO robot
- Computational Thinking
- The Choregraphe application
- First Code

### Scenarios for discussion

- At the first moment students will take care of the importance of programming – motivational video - What do most schools not teach? <https://youtu.be/pdayrg9gcek>. They will discuss in pairs, this topic;
- In the next stage students interact with NAO robot and watch a video about NAO main features - Knowing NAO Robot NAO Next Gen : the new robot of Aldebaran Robotics (now SoftBank Robotics Europe) – presentation video <https://youtu.be/nNbj2G3GmAo>
- In order to start programming students are introduced to the Computational Thinking main steps. They must watch a video presentation and look for more information in BBC - Computational thinking; <https://www.bbc.co.uk/bitesize/guides/zp92mp3/revision/1>  
In pairs, students must produce a little presentation about this subject and share it with the class.
- Teacher explains that to start programming NAO, students should consult NAO Software 1.14.5 documentation - Choregraphe User Guide
- After the teacher presentation and explanation - how to connect NAO to the code, how to export the code, students should develop the work proposed at the students guide and make a little code for NAO.

## CONCLUSION

The analysis of short videos and the discussion of ideas, followed by the students' presentations, were the facilitating and motivating means for the following sessions. The small program proposed, developed and improved by the students in a process of working in pairs but without teacher intervention constitutes a catalyst for the development of the programs that will follow.

Students aim to improve their NAO programming skills to present to their Erasmus partners, the challenge is very exciting.

### **Methods**

*presentation*  
*talk*

*interview*  
*demonstration*

### **Work forms**

*individual work*  
*work in pairs*



*work on the text*  
*interactive exercise /simulation on the computer*

*role playing*

*group work*  
*frontal work*

### **Material**

- Computers
- Student guide (attached to this document)  
<https://edufor.sharepoint.com/:w:/s/Erasmus554/EV8HHiHuMEFLmCJHSRQw34wB4-CJ6TdSxHq1zAZ-P7c-Q?e=VgRnOI>
- Video about programming importance - What do most schools not teach?
- Video about NAO Robot - NAO Next Gen : the new robot of Aldebaran Robotics
- Video about Computational Thinking - Computational Thinking
- Choregraphe. Exe
- NAO robot

### **Literature**

- What do most schools not teach?; <https://youtu.be/pdayrg9gcek>
- Computational Thinking ; <https://youtu.be/kVfGUdlaUvY>
- NAO Next Gen : the new robot of Aldebaran Robotics (now SoftBank Robotics Europe)  
<https://youtu.be/nNbj2G3GmAo>
- **BBC - Computational thinking;** <https://www.bbc.co.uk/bitesize/guides/zp92mp3/revision/1>
- NAO Software 1.14.5 documentation; [http://doc.aldebaran.com/1-14/software/choregraphe/starting\\_discovery.html](http://doc.aldebaran.com/1-14/software/choregraphe/starting_discovery.html)

### PERSONAL OBSERVATIONS, COMMENTS AND NOTES

As students are used to work with Scratch they find easy to start programing NAO with Choregraphe. Students are very motivated and bring to lessons fresh and fun ideas.