

CLIL Lesson:

Developer: Ioanna Ziaka

Timing: 90 minutes

Age of students: 11-12

Context and Prior Knowledge: Some exposure to Lego Mindstorms ev3 with basic familiarity with action and flow control blocks and ultrasonic sensors as devices

Lesson Steps

1. 4-5'	Lead in and Connection to previous learning: Introducing the subject - Teacher shows the first slide on the ppt and elicits answers working on the word "sensor", the suffix -sonic and the prefix ultra-.
2. 3-4'	The teacher moves on to the second slide and elicits answers on the question. Then answers are presented.
3. 9-12'	Similar procedure is followed with slides 3-5. The teacher is advised to spend as much time as sees fit to elicit some answers from the learners.
2'	Learners are shown an extract from a video ( <a href="https://www.youtube.com/watch?v=GVga7WioP-0">https://www.youtube.com/watch?v=GVga7WioP-0</a> from 0:13'onwards - to avoid advertising the brand of the car or any other advertisement of a car that uses the same feature, since this technology is becoming particularly widespread) to activate their engagement and motivation to ultrasonic sensors and their use and promote their understanding of the introduction of robotics/ict in their curricula. It may also enhance their engagement with robotics since it makes the following task realistic rather than abstract experimentation and gaming. If learners have not seen or used the ultrasonic sensor before, the teacher can start with this slide first to attract attention to what ultrasonic sensors can do.
5. Rest of time	Learners are introduced to the task: move the robot backwards and avoid hitting a wall behind it. To make reverse movement safer they must add alarm sound once the robot gets closer to the wall and the alarm becomes more intense as the distance becomes even smaller (imitating parking assist applications), Additionally, the driver-user sees a happy face on the screen when the distance is safe enough, while a sad face appears on screen when the wall is at a smaller distance.  The task is set in a way to lead learners into the orderly construction of the program. The teacher allows learners to look for and experiment with blocks they may use giving learners space to hypothesize, test, discuss and re-edit their work. As learners try to work out the program, the teacher moves around the pairs/groups to provide guidance or help whenever necessary. This is provided through hints and not direct solutions. The teacher interferes whenever severe obstacles are met by learners. If necessary, the teacher gives the task in green and orange fonts to help learners look for the blocks in the action or flow controls respectively. If learners are more familiar with the controls, the task can be given in black font. The task takes as much time as necessary for learners to complete the task. Whenever necessary/asked, the teacher helps with suggestions.  During the whole problem-solving activity, learners are asked to keep notes of the problems they face and record solutions thought of. If learners wish, they can upload their program or problems faced on a padlet for discussion with their peers.