Co-funded by the Erasmus+ Programme of the European Union

We are the makers – IoT Learning Scenario – How to build a smartwatch and not to touch our face during Coronavirus

1. **Title of the Scenario**	***How to build a smartwatch and not to touch our face during Coronavirus***
2. **Target group**	This scenario can suit secondary school and high school
3. **Duration**	This scenario can be divided into 3 different 1-hour lessons.
4. **Learning needs**	Experience with 3D modeling and printing, and experience with makecode
5. **Expected learning outcomes**	Biology: differences between virus and microbes History and Anthropology: why European spread germs, killing natives, while pre-Colombian peoples did not exchange with the conquistadores their illnesses. Coronavirus and citizenship competence: show the most important innovations used in order to help during the coronavirus' pandemic 3D printer and coding: Learn to print in 3d, and learn to code the wearable
6. **Methodologies**	Lesson 1: explain what virus and microbes are; show the history related to germs Lesson 2: innovations for helping during the Coronavirus' pandemic – design the smartwatch on Tinkercad Lesson 3: each student (or groups of students) writes the code for the microbit, using the magnetometer, and finally tests the smartwatch (which was printed)
7. **Place / Environment**	Classroom and lab
8. **Tools / Materials / Resources**	Projector, Audio system or Interactive whiteboard, Computers, 3D printer, magnet.

9. **Step by step description of the activity / content**	Lesson 1 1. Use the presentation (link) to involve students and share some information about virus and microbes 2. Explain why epidemic was the most important weapon for winning a war, before the second war war 3. How virus and microbe took origin 4. Why pre-Colombian peoples hadn't germs for fighting the European troops Lesson 2 1. Talk about Coronavirus 2. Ask students about ideas for helping during the pandemic, while waiting for a vaccine or a drug: use the interactive blackboard all together or sharing a padlet that students can open with their laptop, tablet, smartphone. 3. Talk about innovations and the use of robots in the healthcare system: I-RIM and Tech for Care 4. Each student, or students divided into groups of three work on the design of the smartwatch: it must contain the microbit. The goal is that the microbit should alert each time our hand is too close to the face. They will wear a magnetic necklace or an earring. The microbit can feel the magnetic field (it has got a magnetometer) and when the magnetic intensity overpasses a certain measure (a threshold will be decided – students will try different thresholds), the smart object will produce a sound, or it will show a cross of LEDs. Lesson 3 1. Each student or a group of three will go on writing the code of their smart object. They will use makecode. 2. They will calibrate their microbit: the first time they use the magnetometer it is required to tilt the microbit, as long as each led is red. 3. They will insert the microbit in the printed container and they test the "no-touch-face" wearable. 4. If the wearable works, they can add a step-counter into their code, in order to have a complete smartwatch.
10. **Feedback**	Lesson 1: test what did they understood with a questionnaire Lesson 2: Quality of the 3D model Lesson 3: Quality of the smartwatch
11. **Assessment & Evaluation**	- Lesson 1: Did students understand about viruses, microbes, and the contingent facts which have led Europeans to dominate all over the world? - Lesson 2: Have students understood what is the Sars-Cov-2, and how robotics has been useful for helping during the pandemic? - Lesson 3: Have they learned how to print and program a smart object for limiting contagion?