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| Year 1  Activity 3  UNPLUGGED CODING - SCRATCH | |
| Overview | Computational Thinking entails the capability to resolve problems algorithmically and logically. It is applicable across subjects beyond Science, Technology, Engineering, and Mathematics (STEM) which include the social sciences, language and arts. Students can engage in activities where they identify patterns in grammar as well as sentence structure and use models for studying relationships.  Through coding young generations have the chance to be not only passive consumers of ICT but also active citizens able to develop methods and contents in order to solve problems and seize the opportunities that the society offers them.  Codes allows to enhance computational thinking in kids of all ages in an involving and intuitive way.  It’s not only a matter of ICT, in fact coding is not a subject, it is a practice, a way of tackling problems and it can be applied to every field.  Goal of the activity is not to turn everyone in computer programmer, on the contrary it has the aim to spread the scientific knowledge for a wider understanding of our society.  The challenge is to find an instrument and a methodology which are at the same time attractive, useful and effective for both students and teachers. |
| Learning objectives | * Citizenship key competencies   Maths, science, ICT: To use aspects of computational thinking to complete a goal.   * Digital skill: To develop understanding of how computer and technology works. * Entrepreneurship: solve problems and put solutions forward; choose among different options; make decisions; be flexible; planning and designing. * During the task the pupils learn how:   + To design   + To organize information   + To be involved and share decisions   + To act responsably   + To solve problems   + To approach new devices * English language: Learning English words and expressions, follow instructions. |
| Times | **PHASE 1 – UNPLUGGED CODING**   * From October to January - 1 hour per week   **PHASE 2 - SCRATCH**   * From February to May - 1 hour per week |
| Resources | * ICT devices: tablet, computer, projectors, interactive whiteboard, document camera, robot, etc.; * Open source software, slide shows, PPT, PDF, web; * Unplugged coding activities: https://csunplugged.org/en/ * Web site: https://code.org/ * Scratch * http://scratch.mit.edu * <http://scratched.gse.harvard.edu/> |
| Steps | **PHASE 1 – UNPLUGGED CODING**  (Unplugged Coding Activities are defined as teaching material that teaches Computer Science through engaging games and puzzles that use cards, string, crayons and lots of running around and that can be conducted without the use of computers or electronic equipment.)   1. Pupils learn how to execute, read and write the steps of a path on a grid   (forward, left, right, backwards) using arrows, left rights cards, binary codes ect.   1. Pupils perform with their body some exercises to acquire the fundamental concepts of coding 2. Abstraction practice thruogh grids with robots 3. Role play or gaming tables   **PHASE 2 - SCRATCH**  (Scratch is an open source software and can be edited to fit to the project needs. It allows students to create games or multimedia and interactive animations with images, music and sounds.  Scratch incorporates tools of vectorial drawing, the access to the webcam, and the possibility to use multimedial files, thus empowering the students to develop their digital skills. Scratch is really user friendly and anyone can learn how to use it by practicing.  Students can grasp Coding and computazional thinking without studying the theory of them beforehand).   * Getting to know the concepts of instruction, algorithm, bug, debug, code e di interface. * Using visual programming languages (Blocks). * Creating stories through text, video, audio, images. * Approaching computational thinking Code.org/SCRATCH * Using Scratch blocks to write code lines from simple to complex. * Editing the "Sprite" with Leonardo’s toy that has been produced during the P10 activity: after reproducing in the fablab one of Leonardo’s toy it can be scanned by the 3D scanner and used as Sprite. * Background editing * Writing a script to introduce the Sprite. * Recording an audio to introduce the Sprite |
| Output | **PHASE 1 – UNPLUGGED CODING**  Pupils write lines of code in order to give instructions to a robot moving on a grid.  **PHASE 2 - SCRATCH**  Pupils design a short video where the main character is one of Leonardo’s toys who introduces itself. |
| Evaluation | Pupils add blocks to the script in order to give instructions to the Sprite |
| Assessment | Pupils name the different kind of blocks and know the procedures. |
| Methodology | * Project based learning * Collaborative learning |