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

# BotSTEM – Erasms+ KA2 Project

**2017-1-ES01-KA201-038204**

## Good practice template

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| **1. Title of the activity / practice** | **High density cognitive paths**<br>**doing geometry: creating paths and commands executable by a child or a robot** |
| **2. Origin of the activity** | Caloi Serafino, a primary school teacher, from the province of Verona (Italy).<br>High density cognitive paths are mathematical activities that develop the skill and the pleasure of mathematics;<br>They are designed and created because in each school with the materials and the space that are available we can create learning opportunities feasible simple effective saving time and energy.<br>The paths are part of the project "not one less" with which we want to design and create simple and effective learning pathways providing the best possible school, the one who knows how to reach everyone with the best chance of learning:<br>- those who have just arrived in our country<br>- those who have learning difficulties<br>- traveling children<br>- those who have attend school irregularly<br>- those who have no learning difficulties and have little "want to do"<br>- those who have no learning difficulties and really want to do<br>...<br>all for the best school where every child, from the last, true figure of our doing, to the first, can develop their potential and where everyone can learn while having fun. |
| **3. Age of the students** | 6-7 years old |
| **4. Target group (type of the learners, size of the group)** | class |
| **5. School subjects + topics concerned** | This path works on the ability to create routes on a squared surface |
| **6. Educational goals of the practice** | presentation and / or review of some geometrical concepts about the checkered and rotation |
| **7. Duration** | 1 or more lesson of 2 hours |

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| **8. Place** | A floor with sufficiently large square tiles on which we can work with children; if the floor has not the tiles can create the squared paper with ribbon on a normal linoleum floor or other material. |

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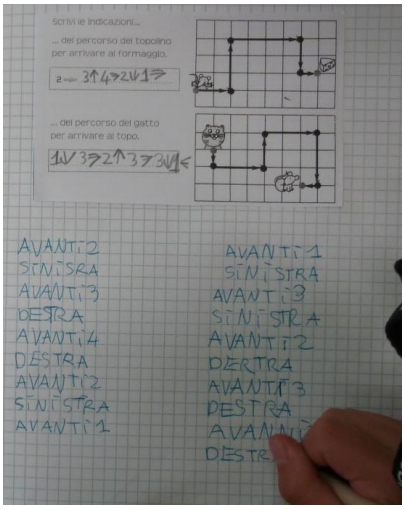
| **9. Short description of the activity** | Example for a class of 20 children:<br>a floor with square tiles and paper tape are needed<br><br>In these images it is shown a possible sequence of work<br><br>-it is possible to start working on the floor or from a sheet like the one shown on the right where the child should write down the commands to move something on the squares<br><br>-than the children work in small groups with different roles<br>a first group creates a route on a sheet and gives the only commands to a second group that draws the route on the floor<br>than the two groups compare the outcome with the designed route of the first group<br><br>-depending on the age and abilities of the children, it is possible to add more commands relating rotation and direction changes, corners,grades…<br><br>-in further lessons it is possible to implement this path with the use of robots and design various routes with these.<br><br>There are many variations possible:<br>a first group draws a route on a sheet, than a second group programs the robot<br>measures of distance can be introduced in the routes, as well as angles<br>it may be asked to the robot to draw routes of geometric fi<br>…<br>During this activity the children have to "create"<br>a code, a language to program the routes |



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| **10. Evaluation** | This activity stimulates discussion and debate among children so that they learn to use the precise terms of the geometry to find the solution to the problem when for example the path from design becomes complex;<br>also stimulates the creativity when it is expected to develop a simple and comprehensible language for the commands;<br>it assesses the ability to work in teams;<br>this activity gives the teacher a chance to discuss the work done in class and so to actually treat and significantly concepts such as floor, path. |
| **11. Materials / Resources / technical requirements** | Floor with squared tiles, paper tape. |
| **12. Tips for educators / theoretical background (if applicable) or curriculum context** | The activity is very simple to arrange and to make but it has a high teaching yield both for the development and / or the review of geometrical concepts and for the development of specific skills relating to geometry and coding;<br>the activity also helps children to like mathematics;<br>the task then, very importantly, allows every child, even those who has learning difficulties, to actively participate in the construction of their own learning. |