**Lesson Plane Table**

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| **Subject:** | **DIGITAL TEACHING IN COMPUTER SCIENCE SUBJECT – MARTANO, ITALY** | | | | |
| **Authors:** | **Teachers:** Adriana Pîrvan  **Students:** Mieilă Eduard  Cocioran Ștefan  Pîrvu Daniel | | | | |
| Date: | | | | 14/03/ \_2018\_ | |
| Estimated time: | | 50 minutes + 50 minutes |  | |  |
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| Summary: |  | | | | |

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| **Objectives**  (Specify skills information that will be taught) | **Activity/ Information**  **Teacher Guide/ Student guide** | **Materials Needed**  (Other resources - web, book...) | **Assessment Methods**  (steps to check for student understanding) | **Time**  **Where?** |
| \* understanding the notions of theory in the discipline of Informatics studied in the 9th grade  \* solving interdisciplinary applications using programming knowledge  \* understanding the concepts of graph theory and solving some interdisciplinary applications  \* creating 2D games without programming knowledge  ***Know Concepts or Keywords :***  - basic concepts in C++;  - basic concepts in Math;  - concepts of computer operation; | **Motivation Activities**   * Do you want to solve math, physical problems with programming?     Choose a class of problems and enter the input data to get output data (results) with **I9 CNA App**!  - Do you want to solve some problems in your everyday life?  The **Theory of graphs** help us solve such problems!   * Do you want to create your own game?   Draw the characters you want in the game and add drag and drop commands with **Game Maker Studio!** | * Phone * Worksheet * PC * Internet * Video-projector | * Resolve interactive Apps * Drawing graphs and solving the requirements and quizzes * Drawing characters and animating them in the game | **In Classroom**  30 minutes+  20 minutes+  50 minutes |

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| **Description of the activity 1:** | |
| **Introduction** | To create a program in solving a problem we need to understand the algorithm to solve it. We can do this with **I9 CAN App.** |
| **Main activity** | Solving math classes |
| **Lesson Guide (Step by step)** | * passing the notion of theory: definitions, syntaxes and examples written in C++; * choosing a class of problems; * description of the problem-solving algorithm; * writing of input data; * verification of output data obtained; |
| **Exercises (2 or 3 levels of difficulty)** | * processing digits of a number * determining the divisors of a number * resolving a system of two equations * converting a number from one base to another |
| **Conclusion and Evaluation** | Students are challenged to solve various math problems.  They check the correctness of the result obtained using learned mathematical methods and programming algorithms |
| **Notes:** | Students check their knowledge of mathematics and computer science.  The app is made for Android mobile devices and Windows computers called **I9 CNA**.  The name of the app comes from the abbreviation of IT for 9th grade, Anastasescu National College. All the information of the app have been selected from the IT books used in our high-school.  The app is free-to-download for Android and Windows based devices from the Official Application Website <https://i9cna.wordpress.com/> |
| **Description of the activity 2:** | |
| **Introduction** | To solve certain problems in everyday life, we need concepts in the **Theory of graphs**. |
| **Main activity** | Interactive solving of some applications |
| **Lesson Guide (Step by step)** | * passing the concepts of graph theory; * solving the proposed applications; * solving quizzes; * solving some fun apps; * Hangman game; |
| **Exercises (2 or 3 levels of difficulty)** | * drawing graphs on the interactive whiteboard * solving drag and drop tests * solving final quizzes |
| **Conclusion and Evaluation** | Students discover that many of the problems in everyday life can be solved with the help of computer science or using graphs.  They have immediate feedback to what they have learned with quizzes and interactive applications. |
| **Notes:** | The platform is used in class computer for 11th grade:  <http://campion.edu.ro/arhiva/www/arhiva_2009/seds/17/index.htm> |
| **Description of the activity 3:** | |
| **Introduction** | Attracting students to programming can also be done through the game: **Game Maker Studio**. |
| **Main activity** | Making an interactive game |
| **Lesson Guide (Step by step)** | * installing *Game Maker Studio* on each computer to create 2D games; * making the characters needed for the game; * converting drawn objects into objects and adding them to the screen; * adding commands for these objects; * testing the created game; |
| **Exercises (2 or 3 levels of difficulty)** | * a spaceship is drawn, transforms into an object and is added to the screen; * add commands to go left, right etc. * there are drawn asteroids of different shapes, sizes and colors at falling speeds; * a bar is added below the screen: when the asteroids hit the bar, they went back up, not to add many, but just to repeat; * a move is added to the asteroid transfer and when the commuter touches an asteroid, the game is reset. |
| **Conclusion and Evaluation** | Students are delighted to draw their own characters, set them up and play the game.  The characters must perform the movements according to the given commands. |
| **Notes:** | The location where ***Game Maker Studio*** is located:  <http://www.yoyogames.com/get> |

**Bibliography**

* IT books used in our high-school for 9th grade.