**Lesson Plane Table**

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| **Subject:** | **DIGITAL TEACHING IN BIOLOGY SUBJECT – ROȘIORII DE VEDE, ROMANIA** |
| **Authors:** | **Teachers:** Adriana Pîrvan, Florinel Bișag, Cătălina Ștefan, Iancu Maria-Magdalena, Oprea Angelica**Students:** Mieilă Eduard, Cocioran Ștefan, Pîrvu Daniel, Bîntescu Robert, Desculțu Cristian, Stoica Andreea, Crăcănău Andrei, Ciucă Ștefan, Brabete Mădălin, Cristea Răzvan Ionuț, Gheorghe Ilie Lucian, Barbu Emanuel David |
|  Date: | 25/04/ \_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?** |
| \* acquiring knowledge about bone system\* making quizzes on various areas of interest \* acquiring knowledge of Biology by playing \* acquiring knowledge about nervous system\* acquiring knowledge about human body by playing***Know Concepts or Keywords :***- knowledge of Biology at high school;  - computer skills; | **Motivation Activities** * Do you want to know more about the bone system?

 The biology application called **Anatomy Learning - 3D Atlas** for Android gives you all the answers! - Do you want to test your knowledge or test the knowledge of your colleagues?Create your own quiz with **Kahoot!** * Do you want to learn biology in a funny way?

Use **BioMan Biology** and biology will no longer look boring to you!* If you want to learn by yourself at its own pace in an attractive way about nervous system, you can use **The Nervous System – Android App!**
* If you want to learn more about the human body in a funny way, by playing, **White Cell Game** is the solution!
 | * Phone
* Worksheet
* PC
* Internet
* Video-projector
 | * Resolve Quiz
* Making the quiz and testing it
* Solve Quizzes
* Solve tests
 | **In Classroom**15 minutes+20 minutes+15 minutes+10 minutes+40 minutes |

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| **Description of the activity 1:** |
| **Introduction** | To understand how the human body works, it requires a 3D graphic representation of it. For this we can use the biology application called **Anatomy Learning - 3D Atlas for Android** |
| **Main activity** | Presentation of the bone system. |
| **Lesson Guide (Step by step)** | * presentation of the bone system, muscle system, internal organs etc.;
* information about the anatomy of the human skeleton in a model in third dimension (3D) highly detailed;
* make quizzes and resolve its;
 |
| **Exercises (2 or 3 levels of difficulty)**  | * manipulating the model, zoom, rotate, move the camera
* displaying the natural pattern or divisions
* getting information on the location and descriptions of bones such as the skull, femur, jaw, scapula, humerus, sternum, pelvis, tibia, vertebrae, etc.
 |
| **Conclusion and Evaluation** | Students are interested and fascinated to see in 3D what they have learned at the course and make a virtual tour in the human body.They check their knowledge with the quizzes they make with this application. |
| **Notes:** | The biology application called Anatomy Learning - 3D Atlas for Android is made by a high school from Bucharest in partnership with our High School. It can be downloaded from:<https://play.google.com/store/apps/details?id=com.AnatomyLearning.Anatomy3DViewer3> |
| **Description of the activity 2:** |
| **Introduction** | For those biologists and apps for Android, a useful tool in verifying knowledge is quizzes. So, we can use **Kahoot!** platform. |
| **Main activity** | Interactive solving of quizzes |
| **Lesson Guide (Step by step)** | * students and teachers create their own account on the platform, on their devices;
* the quiz is projected on the wall with the help of the video projector;
* this contained 30 biology questions with 30 seconds of response time;
* everyone tries to give the right answers;
* who obtained the best score is the winner
 |
| **Exercises (2 or 3 levels of difficulty)**  | * the quiz contained biology questions, vegetal, animal and human biology;
* the questions have different levels of difficulty;
* there are of general culture and funny questions
 |
| **Conclusion and Evaluation** | The atmosphere is exciting and students are determined to find the right answers.After each question, the correct answer is displayed and the score for each participant is updated in real time. |
| **Notes:** | The Kahoot! platform can be accessed using <https://kahoot.com/> to create a quiz or <https://kahoot.it/> to play a quiz using a game PIN. Also, the Kahoot! App is available on Apple App Store or Google Play.Kahoot was designed for social learning, with learners gathered around a common screen such as an interactive whiteboard, projector or a computer monitor. The game design is such that the players are required to frequently look up from their devices. |
| **Description of the activity 3:** |
| **Introduction** | You can learn about cells, ecology, genetics, physiology and much more in a funny way with **BioMan Biology!** |
| **Main activity** | Solve quizzes |
| **Lesson Guide (Step by step)** | * creating an account on the site;
* trying learning games;
* viewing virtual labs;
* solving quizzes
 |
| **Exercises (2 or 3 levels of difficulty)**  | * playing fun computer games;
* solve quizzes
 |
| **Conclusion and Evaluation** | Students learn new things of Biology in virtual labs and by playing. They check their knowledge by solving quizzes. |
| **Notes:** | **BioMan Biology** is the fun place to learn Biology: <https://www.biomanbio.com> |
| **Description of the activity 4:** |
| **Introduction** | **The Nervous System – Android App** offers the possibility of learning by yourself at its own pace in an attractive way. |
| **Main activity** | Learning new things about the nervous system and to assess the accumulated knowledge. |
| **Lesson Guide (Step by step)** | * installing tools used from *Notes*;
* overview of the nervous system along with photos, videos
* solve the quizzes
 |
| **Exercises (2 or 3 levels of difficulty)**  | * learn new things with interactive lessons;
* solve the quizzes and the final test
 |
| **Conclusion and Evaluation** | The app is easy to use and understand and it allows its users to learn new things, no matter where they are thanks to its portable nature. ***The Nervous System*** also features a final test used to determine the user’s knowledge and create a leader board with the users with the highest scores, thus allowing everyone to see where they stack up against everyone else. |
| **Notes:** | Overview of tools used:* Node.js - <https://nodejs.org/en/>
* Apache Cordova (+Adobe Phonegap) <https://cordova.apache.org/> (<https://phonegap.com/>)
* Visual Studio Code (VSCode) - <https://code.visualstudio.com/>
* Android SDK (+Java JDK) - <https://developer.android.com/studio/>
* Image editor – Adobe Photoshop/Gimp/Paint
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| **Description of the activity 5:** |
| **Introduction** | Knowing the human body through the game in a funny way, by playing, **White Cell Game** |
| **Main activity** | Treasure hunt |
| **Lesson Guide (Step by step)** | * playing with a *white cell* flowing through the whole body, to destroy all the enemies - *viruses*;
* decipher the message received at the end of the game and start looking for the treasure
 |
| **Exercises (2 or 3 levels of difficulty)**  | * as each team finishes playing the game White Cell, gets a coded message and starts looking for the treasure;
* the encoded message is deciphered and is an indication of the next hidden message in high school; deciphering the message is done by solving different puzzles with the help of biology knowledge;
* after finding the 4 clues, the students must to collect all the evidences, they must to choose a key to open a door where they could find the final flower and must to bring to the lab.
 |
| **Conclusion and Evaluation** | The students relax and have fun, and the winner finds the treasure (flower) and receives a surprise prize. |
| **Notes:** | The game was created and designed using Unity3D engine and assets from Asset Store and is a 2D platform game. This game is both compatible for 32-bits and 64-bits windows versions.<https://store.unity.com/> to get Unity3D for free<https://www.assetstore.unity3d.com/> to find all the assets |

**Bibliography**

* IT books used in our high-school.