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| **COURSE PLAN**LESSON/OBJECTIVE:BIOLOGY COURSE Duration: 4 teaching hours |
| **Subject/****Name of teaching part** |  Human environment interventions-Air pollution/Greenhouse effect | *ΤΑΞΗ:* | 3rd Grade of Middle school |
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| ***Course Objectives*** |
| *Α. According to the subject matter* | 1. What is greenhouse effect and why it took this name?
2. Ways of counting the temperature of atmosphere
3. What are photons?
4. I write down the gathering of greenhouse fumes
5. The meaning of glasswork in the greenhouse effect.
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| *Β. According to the use of new technologies* | 1. I learn what simulation is through a computer2. I install a program and I follow the instructions, step by step in a simulation program.  |
| *Γ. The learning process* | 1. What is the simulation and how it helps us to understand an effect?2. I develop my observation, focus on a picture and come to conclusions |
| ***Class Organization*** |
|  * Students feel that they are close to the teacher
* Discuss while having optical touch
* Dialectic type of teaching with questions and answers
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| ***Tools and Software used*** |
| 1. The simulation of « greenhouse effect» from PHET

<http://phet.colorado.edu/el/simulation/greenhouse>.In order to install a program and see the simulation in your computer push ‘’capture”. The homepage is the following:C:\Users\User\Desktop\Καταγραφή.PNG1. Slide player
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| **PHASES-STEPS** |
| 1. INTRODUCTION- (preparation/ brief introduction/to stimulate the students interest)
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| <https://www.slideshare.net/guesteb2b021/and-more>Watch the video in order to prepare students what the greenhouse effect is. We ask them to see only the pictures and answer a few questions.1. Why did it take this name**? Greenhouse effect**
2. Who gave this name and when?
3. We ask them to explain with our help the pictures of slide 3.
4. We display together, in a simple way, the environment consequences of greenhouse effect: the thaw of meltwater, climate change.
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| 1. DETAILED PRESENTATION
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|  **Activity 1****Greenhouse effect****I**n the homepage of greenhouse effect, choose in the atmosphere the category ”Today”In the first application card:* choose the temperature mark in Celsius
* mark the «projection of photons»
* press the button of player which you see under the picture

Afterwards, as you have noticed the screen, answer the following questions.1. Which is the name of yellow photons that move down?
2. Which is the name of red photons that move up?
3. Look the thermometer and write down the temperature.
4. Watch the right part of screen and write down the inventory of greenhouse fumes in ppm (

Parts in million).H2 O……………………………………………………………………………………………CO2…………………………………………………………………………………………….CH4…………………………………………………………………………………………………………………………………………….N2O……………………………………………………………………………………………..1. As you wait the temperature to be stabilized, write down the temperature of thermometer.

K………………………………………………………………………………………………0F………………………………………………………………………………………………0C………………………………………………………………………………………………Then, in the homepage of greenhouse effect, choose in atmosphere the category “1750”1. Watch the right part of screen and write down the inventory of greenhouse fumes in ppm (parts in million).

H2O…………………………………………………………………………………………….CO2………………………………………………………………………………………..CH4…………………………………………………………………………………………N2O…………………………………………………………………………………………1. After waiting the temperature to be stabilized, write down the temperature of thermometer.

K………………………………………………………………………………………………0F………………………………………………………………………………………………0C………………………………………………………………………………………………In the homepage of greenhouse effect, choose in atmosphere the category “The ice age”1. Watch the right part of screen and write down the the inventory of greenhouse fumes in ppm (parts in million).

H2O…………………………………………………………………………………………….CO2………………………………………………………………………………………..CH4…………………………………………………………………………………………N2O…………………………………………………………………………………………1. After waiting the temperature to be stabilized, write down the temperature of thermometer.

K………………………………………………………………………………………………0F………………………………………………………………………………………………0C……………………………………………………………………………………………… |
| 1. GUIDANCE PRACTICE/TRAINING
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|  **Activity 2****Glass sheets** After you choose the card “glass sheets”, you can see in the screen this pictureC:\Users\User\Desktop\Καταγραφή.PNG 10.Write down the temperature of thermometer when there is no paneK………………………………………………………………………………°F ………………………………………………………………………………°C……………………………………………………………………………… |
|  4.CLOSING AND RESTATING WHAT HAS BEEN LEARNED |
| The teacher makes a restatement, with a short and comprehensive way, pointing to the most important things. We ask for maybe questions. **PRACTICE WITHOUT GUIDANCE**Then, check the choice “glass sheets” the “glazing of sheet glasses”1. Watch the photons. Where is the place of their incident and where do they emanate? Does they cross in the glass or not?

………………………………………………………………………………………………….1. After waiting the temperature to be stabilized, write down the temperature

K………………………………………………………………………………...............................................°F ……………………………………………………………………………….............................................°C……………………………………………………………………………….............................................13.Watch the temperature after the assignement of glass sheets and write which is the meaning of glass sheets in greenhouse effect.................................................................................................................................................................... |
|  ***ADDITIONAL NOTES*** |
| *ICT and Technology**(used in the class)* | Computer per a student Projector |
| ***For Special Educational Needs*** *(change teaching methods based on the learning needs of each individual student with SEN)* | * The students take as many time as they need without time press
* We avoid to create them stress or angst. The teacher is there and helps the student. He comments them for their success trial.
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|  ***HOMEWORK/WRITTEN PRODUCTION*** |
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\*the structure of the lesson plan is based on the “Hunter method”