



**CLIL Lesson Plan**

**Natural Sciences**

**Teacher:  
Lykogiannaki Styliani**

**Subjects  
involved:** Chemistry, Biology and English

**Grade: 9<sup>th</sup> grade  
Time: 5 lessons of 45 minutes**

**Unit or topic:** Greenhouse effect, global warming, environment **English level: from B1 to C1**

### **Learning Outcomes**

By the end of these lessons students will:

Be introduced to the concept of global warming and its parameters.

Be introduced to the greenhouse effect and its side effects on human life and wildlife.

Practise and expand vocabulary regarding environmental issues.

Rank environmental problems.

Suggest solutions on environmental problems.

Carry out research.

Develop autonomous learning through project work.

Develop ecological culture and environmentally responsible behavior.

Develop critical thinking.

Develop decision-making skills.

### **Assessment**

Teacher peer and self-assessment processes will be introduced to assess how well learners will:

Answer activities on their worksheets.

Understand information based on a diagram.

Participate in class.

Do research about greenhouse effect and global warming and present the outcomes of their work.

Collect scientific information and share their ideas in class.

Use suitable vocabulary to express their viewpoints and support their arguments.

Prepare a PowerPoint on greenhouse effect and/or global warming and present their project in class.



Create posters about environmental topics such as greenhouse effect and global warming.  
 Produce a school eco-code.  
 Write an eco newsletter.

<b>Content</b>	<b>Cognition</b>
Define greenhouse effect and global warming. Identify the causes and consequences of the greenhouse effect. Identify the causes and consequences of global warming. Generate discussion on environmental topics. Brainstorm ideas for action. Prioritize information.	Realize the connection between greenhouse effect and global warming. Elaborate on scientific topics that affect life on our planet. Enhance critical thinking. Encourage decision – making skills. Develop problem – solving skills. Develop argumentation skills.

**Culture**

Carry out research on a scientific issue and collect relevant information.  
 Use the Internet to look for information from reliable online sources.  
 Use collaborative learning and the project approach to work and expand their knowledge.  
 Become aware of the causes and consequences of environmental pollution.  
 Use suitable vocabulary to exchange ideas and opinions.  
 Make suggestions and seek for solutions to tackle environmental problems.

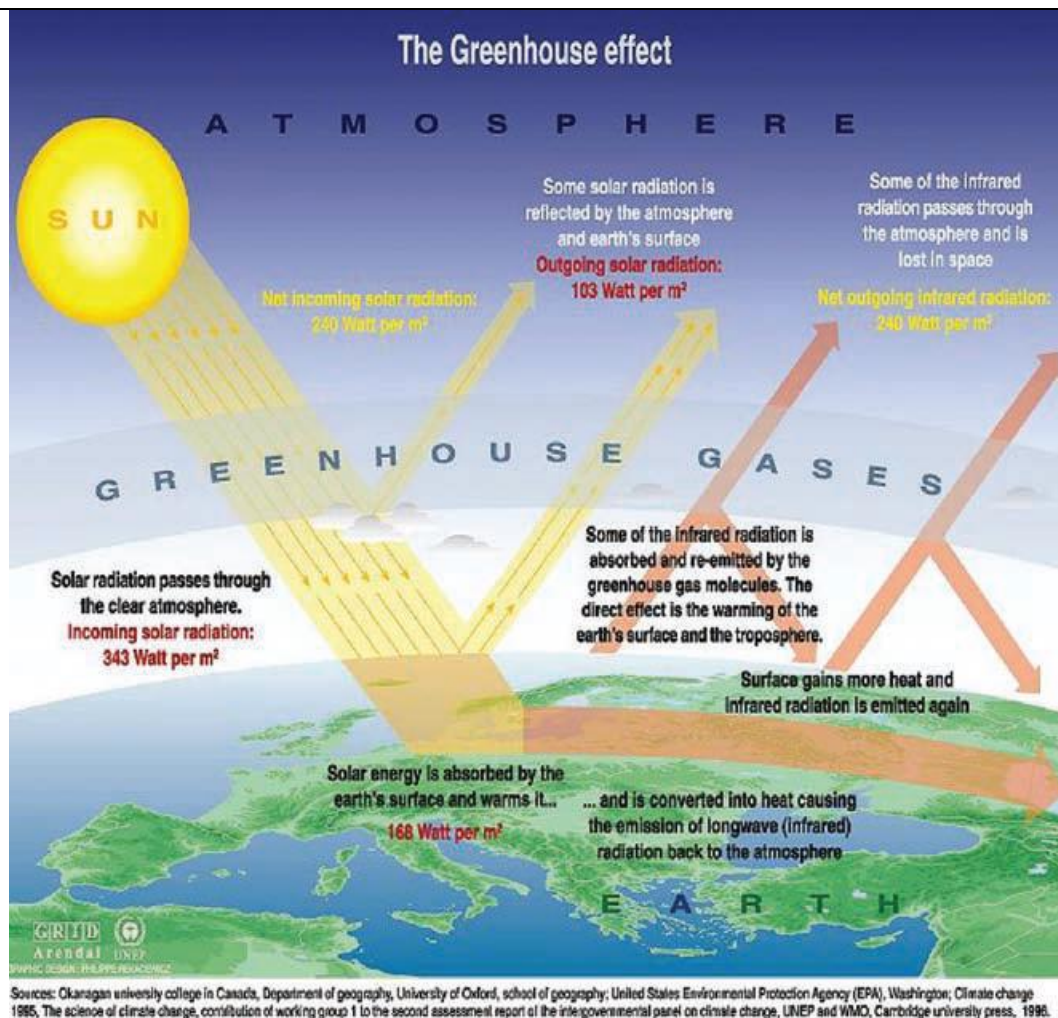
<b>Communication</b>		
<b>Language OF learning</b>	<b>Language FOR learning</b>	<b>Language THROUGH learning</b>
Key vocabulary, scientific terms: Greenhouse effect Global warming greenhouse gases infrared radiation carbon dioxide	Asking questions. Introducing and elaborating on a topic: What are the most serious environmental problems we face nowadays?	Presenting and using new scientific terms. Practising and expanding new vocabulary. Brainstorming and exchanging ideas.



<p>solar energy burning fossil fuels heatwaves ice melting sea level rising pollution of the atmosphere ecosystems balance eco-code climate change natural disasters floods droughts endangered species biodiversity climate action sustainable development</p>	<p>What are the causes and consequences of the greenhouse effect? What are the causes and consequences of global warming? Defining and describing: Asking for and making predictions: What will happen if we do not reduce pollution? What will be the impact of the greenhouse effect and global warming on humans and ecosystems? Making suggestions: How can we protect life on earth? What can we do to save our planet? How can we contribute to sustainable development? How can we achieve a better quality of life? How can we combat climate change and its impacts?</p>	<p>Sharing opinions. Making predictions. Suggesting solutions. Drawing conclusions.</p>
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**Procedures / Activities**

**Brainstorming activity based on visual stimuli:** Students look at the diagram, which depicts the greenhouse effect and explains how the greenhouse gases harm the earth. Then, they come up with ideas to reduce greenhouse gases that are trapped in the atmosphere. [20 minutes]



Adapted from Student's book Think Teen, 3rd grade, p. 104

**Filling in the missing information:** Students read the following text that explains global warming and fill in the missing information by choosing the appropriate sentence for each of the blanks. There is one extra sentence. Then, they make a list of all the negative effects of global warming. [20 minutes]

**The Heat is On**

The greenhouse effect is caused by increasing levels of certain gases in the atmosphere. Among them are methane and nitrous oxide, but the worst of all is carbon dioxide. (1) ..... Man releases 400 thousand million tons of carbon dioxide into the air every year. Without any carbon dioxide to trap the sun's heat, the earth would freeze. But as the amount of carbon dioxide grows, too much heat is trapped. (2)



..... The effects of global warming are extremely complex and difficult to predict. Warmer temperatures will probably cause sea levels to rise. (3) ..... Scientists predict that the sea could rise by 15-30 cm in the near future. (4) ..... We must try to change things now, because the greenhouse effect could speed out of control soon with unpredictable results.

- a. One result of this is the slow but steady rise in the world's temperature.
- b. This could endanger coastal towns and cities round the world.
- c. A few experts believe that global warming could be occurring much faster than this.
- d. This comes mainly from burning fossil fuels – coal, oil and gas – and forests.
- e. The glaciers and the polar ice caps may also begin to melt.

*Adapted from workbook Think Teen, 2nd grade, p. 101*

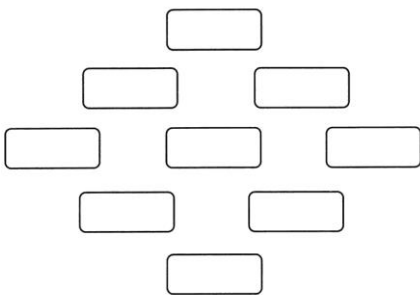
**Diamond ranking activity** [45 minutes]

We divide the students in groups and distribute to each group 12 cards with the following environmental problems: 1. GREENHOUSE EFFECT, 2. GLOBAL WARMING, 3. SEA POLLUTION, 4. PLASTIC RUBBISH, LITTER, 5. TOXICAL, INDUSTRIAL WASTE AND CHEMICALS, 6. AIR POLLUTION, FOSSIL FUEL EMISSION, SMOG, 7. DEFORESTATION, LOSS OF TROPICAL RAINFORESTS, LOGGING, 8. CLIMATE CHANGE AND NATURAL DISASTERS (Earthquakes, tsunamis, volcanic eruptions, floods, tornadoes, hurricanes, cyclones, avalanches, droughts), 9. ENDANGERED SPECIES AND ECOSYSTEMS (A community of living organisms), 10. WILDLIFE AND MARINE LIFE EXTINCTION, 11. LOSS OF BIODIVERSITY (Variety of life on earth), 12. NUCLEAR POWER AND RADIOACTIVE WASTE.

Then, we give the following instructions to the students: "You need to write the most important idea, the problem you consider to be our first priority at the top of the diamond, then the next two most important, are placed in second equal position, then the next three are put at the same level, and so on down to the single least important idea. So, the most 'important', 'significant' statement each group most agrees with is placed at the top of the diamond, while the card which represents the lowest priority is placed at the bottom of the diamond shape." We also explain that it is likely as well as



expected that every group will have different ranking results. “Each group can sort the cards with problems manually and place them into the diamond shape through discussion and negotiation in the next 20 minutes. When you finish, you have 10 minutes to write your ranking onto sheets of A3 with a blank diamond shape ranking template to fill in.” Alternatively, if we project the cards in digital form onto an interactive whiteboard in class, the students of every group can click on the boxes and drag them to the position they choose on the diamond. We allow 10 minutes to justify their ranking with arguments during the last part of the activity. When they are ready, the members of each team explain their choices and justify their top priorities. In the end, we allow some time for reflection and elaboration on the problems that constitute the top priorities. The activity is finished with a debriefing. A variation of this strategy is to let the pupils agree on a common group diamond, if there is more time available, so that they examine different viewpoints and reach on a consensus.



**DIAMOND SHAPE RANKING TEMPLATE**

**Reflection activity** [5 minutes]

Debriefing questions for the teacher to ask after the activity is completed:

- Was it easy to rank the statements into a diamond?
- Where was it difficult to do so and why?
- Did you listen to reasonable arguments from the other students that you had not considered?

When producing a group diamond:

- How did you manage to agree on the final diamond ranking?
- Did you encounter any difficulties throughout the process?

**Project work** [90 minutes]

Students work either individually or in pairs to collect information about the causes and the consequences of the greenhouse effect and global warming and to suggest solutions and actions for the prevention and reduction of these harmful phenomena. Alternatively, they can do research on



another environmental problem that affects the area where they live, for example sea pollution, coast destruction. They present their project outcomes in class in one of the following forms: PowerPoint presentation, poster, leaflet, newsletter, article or digital video.

As a follow-up activity, students suggest actions for saving the planet and come up with ideas to improve their ways of life so as to gradually adopt an eco-friendly lifestyle and to make their school environmentally friendly. They can vote for the most effective solutions and summarize their suggestions for improvement of the current situation and useful eco-tips in school eco-newsletters. For further expansion students can cooperate to create an eco-code or eco-guide and commit to follow and promote the eco rules they have introduced.

#### **Aids and materials**

Book Think Teen, class B: workbook, p. 101.

Book Think Teen, class C: student's book, p. 104.

Smartboard / Interactive whiteboard or computer, projector and screen.

Worksheets.

Students' notebooks.

PowerPoints.

Posters.

Markers.

Flipchart paper.

#### **Scaffolding Strategies**

Tips for the teacher:

Use a photo diagram to explain the stages of the greenhouse effect.

Use a fill-in the blanks activity to describe the process of global warming.

Pre-teach new vocabulary, main scientific terms if necessary.

Use brainstorming to initiate critical thinking and problem-solving.

Tips for the learner:

Expressions for giving an opinion:

I think...

I believe...



In my opinion...

In my view...

From my point of view...

Expressions for making suggestions:

I suggest that...

I recommend...

How about...

What about...

We could...

Expressions for making predictions:

In the near future...

In the distant future...

By 2030...

According to scientists...

Expressions for drawing conclusions:

Therefore/Thus...

In conclusion...

To sum up...

As a result...

Consequently...