

Didactic Scenario

1. Title

GREENHOUSE EFFECT – SCIENTIFIC EXPERIMENT

2. Keywords

engineering, mathematics, physics, technology

3. Basic Information

STEAM Subject: Greenhouse effect

Typical interaction time with the instructional scenario in teaching hours for in-school work: 2 hours

General description of the scenario:

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Weather phenomena	preparation stage	30 minutes daily for a week
Introduction to the topic - watching a movie	preparation stage	15 minutes
Carrying out the experiment	implementation stage	45 minutes

Age group: 9-10 years

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
		X		

Teaching resources

Material: 3 plastic bottles with perforated cups, water, 2 effervescent tablets, 3 thermometers, plasticine

School infrastructure: Interactive board, laptop, video projector

Additional material from external sources/online tools:

<https://www.youtube.com/watch?v=pRFsA6G3Pr8>

https://www.youtube.com/watch?v=i_DAxjw9bS4

Differentiated Instruction for students of differing abilities and learning styles in the same class: N/A

Developed by: Primary education professor Rotaru Angela, science teacher (chemistry)

4. Educational Problem

In this fun and easy environmental science experiment, we will explore and investigate the greenhouse effect.

Students studied about the greenhouse effect in science class, watched educational videos about the greenhouse effect and the effects on plants, animals and humans.

5. Learning Objective (-s)

1. Understanding the "greenhouse effect" phenomenon and the causes that produce it;
2. Carrying out the experiment that tests the greenhouse effect;
3. Identifying methods to limit this phenomenon;
4. The conclusion that: high values of CO₂ concentrations are harmful to people;

6. Phases of the Scenario

Phase 1

Title: Weather phenomena

Indoor	Outdoor	Mixed
	X	
Phase duration in minutes: 30 minutes daily for a week		
Detailed description of the scenario phase: The group of students goes out into nature before the lesson starts for a week to view the different local weather phenomena in the morning, noon and evening, which they record in the class weather log.		
Activity sheets: sheet for noting temperature, precipitation, nature's calendar		
Phase 2		
Title: Introduction to the topic - watching a movie		
Indoor	Outdoor	Mixed
X		
Phase duration in minutes: 15 min		
Detailed description of the scenario phase: The film about sustainable development is being viewed. Objective 13 Climate action is analyzed and discussed. The film Paxi and climate change is viewed.		
Activity sheets: N/A		
Phase 3		
Title: Carrying out the experiment		
Indoor	Outdoor	Mixed
		X
Phase duration in minutes: 45 min		
Detailed description of the scenario phase:		
<ol style="list-style-type: none"> 1. Prepare 3 plastic bottles filled with 200 ml of water. Close each bottle with a lid through which the thermometer is drawn. Measure the temperature in each. 2. Leave the first bottle as is. 3. Put 2 effervescent tablets in the second bottle and close it with a lid through which the thermometer is pulled. 		

4. In the third bottle, add water using a bottle sprayer. Close each bottle with a lid through which the thermometer is drawn.
5. Additionally, place plasticine around the lid opening.
6. Place the bottles in a sunny place for 45 minutes or expose them to artificial light lamps. Again, measure the temperature in each bottle. Note the temperatures

Observations are made on the temperatures in each bottle. Students find the causes that lead to temperature differences through brainstorming. The most relevant solutions are noted. It is expected that the amplification of the greenhouse effect will drastically change the climate throughout the globe, which will determine:

- increasing the water level of the seas and oceans by melting the ice caps from the poles and flooding some land areas;
- change of seasons;
- the disappearance of some species of flora and fauna;
- the transformation of large areas of vegetation into desert;
- increase in the frequency and intensity of extreme weather phenomena (storms, hurricanes, floods, drought).

Activity sheets: record sheet of experiment results

7. Evaluation Methodology

The evaluation will be done with the help of kahoot.it
Play kahoot.it

<https://create.kahoot.it/details/0d567060-4b4f-472b-8e5b-1413c471b54d>

8. Additional Resources for the teacher

N/A