



Colourless and odourless, but still present ... I'm CO₂.

Experiment around CO₂ impacts on Earth temperature

Type of pedagogical project, activity, action, accompanying	Activity (Scientific experiment)
Key words of relevant disciplines/ Pedagogical content	CO ₂ / Global warming/ Greenhouse effect/ Temperature
Problematic	How to identify the presence of CO₂? Does CO₂ have an impact on Earth temperature?
Thematic	The causes of climate change. Air pollution
Disciplines (sciences, geography)	<i>Sciences, Physics, Geography</i>
Pedagogical Objectives/New targeted skills	The students will be able to: - Understand the links between CO ₂ increase and climate change - Understand one of the causes of climate change - make a scientific experiment while following instructions
Public target(s) (age, requested skills...)	10-14 years old
Description (step by step)	<p>The activity consists in 3 steps: experiment 1, experiment 2 and final explanation. Experiment 1 aims at showing how to produce CO₂ in the lab, experiment 2 is aimed at explaining how CO₂ affects Earth temperature. In the final explanation we make sure each student can understand the links between the experiments and what is happening on Earth.</p> <p>The facilitator provides young people with all the material needed to carry out the experiment and a protocol sheet.</p> <p>The facilitator suggests that young people start with Step N ° 1 and ask them to validate it before continuing with Step N ° 2.</p>





	<p>Step 1)</p> <ul style="list-style-type: none"> - Put 100 ml of limewater in flask n°1 and close it with the two-hole stopper - In flask n°2, pour the equivalent of a teaspoon of baking soda - Cover the baking soda pouring 100 ml of white vinegar - Quickly close the flask n°2 with a stopper - Quickly connect the 2 flasks with the hose - Observe the reactions happening in the two flasks <p>In order to conclude and validate this first step, the facilitator invites young people to identify and highlight the presence of CO₂.</p> <p>Step 2)</p> <ul style="list-style-type: none"> - Place the earth globe (the ball representative the Earth) in each plastic sphere and position it on a stable support. - Introduce a thermometer under each globe and note the temperature. Normally the temperature should be identical in each sphere. - Put the infrared lamp above the two spheres. - With the hose, introduce CO₂ in one of the two spheres and use one of these two methods to produce CO₂: <ul style="list-style-type: none"> * choice 1: blow into the hose connected to the sphere * choice 2: use the protocol proposed in step 1 - Observe the result. What is the temperature evolution in the two spheres? <p>Step 3)</p> <p>The facilitator invites each group of young people to present the experiences result in front of their peers.</p> <p>The facilitator explains how these experiments represent what is now happening in our real life.</p>
<p>Place (meeting room, outside space, ...)</p>	<p>Classroom, scientific laboratory</p>
<p>Individual and / or collective actions</p>	<p>In group of 2 to 4 people</p>
<p>Material needed</p>	<p>Step 1: support of flasks, 2 clips, white vinegar, baking soda, 2 flasks, 1 two-hole plug, 1 one-hole plug, hose, plasticine (for sealing), limewater</p> <p>Step 2: 2 globes (balls representative the Earth globe), 2 plastic spheres, 2 thermometers, 1 infrared lamp, 1 hose, material to produce CO₂ (see step 1).</p>





Duration of pedagogical project or activity	20 minutes for the experiment 10 minutes to express the result in group + teacher explanations (additional time)
Evaluation of the new acquired skills	Students are evaluated on how they realized the experiment and on what they understood about Climate Change through discussion
Eco-citizen adaptation, knowledge enhancement and links to other topics	Link to: Activity “Experiment about the impacts of ice melting on the sea level”
Observations	<p>Younger students need more guidance.</p> <p>The activity needs to be accompanied by other lessons on the topic, it can't stand alone. These other lessons should expand the knowledge about the factors that produce CO₂, and deepen the understanding about the consequences that rising temperatures have on the Earth.</p> <p>French Web site : https://lesjeunesfaceauxcc.wixsite.com/lesjeunesfaceauxcc</p> <p>This activity is part of the French Program “Young people and climate change”. It was experimented with people between 11 and 15 years old by environmental education NGOs.</p> <p>The program aims at defining causes and consequences of climate change on the earth and especially in the south of France. Students can analyse its impacts and suggest different means of action and adaptations: everyday life, actions at school...</p> <p>This program is a five-day manifestation at school, with experiments and workshops involving every class of the school.</p>

