



# The Effect of CO<sub>2</sub> on the Atmosphere

(Resource ID: 204)

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This teaching resource is allocated to following University:

**BOKU - University of Natural Resources and Life Sciences Vienna**

Institution:

**Institute of Meteorology (BOKU Vienna)**

<http://sustainicum.at/en/modules/view/204.The-Effect-of-CO2-on-the-Atmosphere>



**Individual work**  
**Group work**  
**Plenum**



**Independent of**  
**the number of**  
**students**



**15 to 30 min**



**English, German**

This building block demonstrates the effect of CO<sub>2</sub> on the absorption of heat radiation and the subsequent increase in the atmosphere's temperature.

CO<sub>2</sub> is a gas that has a significant effect on the climate. The relationship between CO<sub>2</sub> and temperature increases is often called into question. The goal of the experiment described below is to illustrate the effect of a heightened CO<sub>2</sub> concentration in the atmosphere.

To do so, air will be warmed in two open-topped containers, upon which two strong lights are pointed. The changes in the air temperature are documented over the course of the experiment. The air in one container is enriched with CO<sub>2</sub> and differs from the other container only in its considerably higher concentration of CO<sub>2</sub> in the container's air.

After just a few minutes the container, in which the air has a higher CO<sub>2</sub> content, shows a significantly higher temperature. As the basic conditions for the both atmospheres are the same and differ only in the CO<sub>2</sub> content, the temperature difference must be an effect of the heightened radiation absorption of CO<sub>2</sub>.

Increasing the CO<sub>2</sub> content is accomplished by simply dissolving several effervescent tablets containing high levels of CO<sub>2</sub>.

### Aha effect

CO<sub>2</sub> should be understood as an absorbtive gas that has a significant effect on climate.

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## Teaching Tools & Methods



Discussion / debate



Reflection

formteaching\_experiment

## Learning Outcomes

The building block seeks to convey an understanding of the connection between CO<sub>2</sub> and air temperature.

## Relevance for Sustainability

This building block is related to sustainability in that it communicates how the extensively discussed greenhouse gas CO<sub>2</sub> impacts air temperature in the atmosphere. The building block's experiment is demonstrative and easily understandable.

## Related Teaching Resources

No specific previous knowledge / related resources required

## Teaching Methods

 Microtraining

## Preparation Efforts

Low

## Access

Free

## Sources and Links

Seinfeld, J. H. and S. N. Pandis, 1997: Atmospheric Chemistry and Physics: From Air Pollution to Climate Change. Wiley-Interscience.

Ahrens, C. D., 2007: Essentials of Meteorology. An Invitation to the Atmosphere. 5th ed. Thomson Brooks/Cole.

Video: <https://vimeo.com/75471235>

## Funded by

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