

# Air Is Not Nothing

## Topic

Air

## Target group

Students between 8-14 years old

## Working language

English and German (A1/A2)

## Contents

- Air is not nothing
- Air has volume and takes up space
- Air experiments

## Objectives

The students can

- acquire new knowledge about the topic
- learn selected German words in context
- actively listen
- actively take part by thinking, speaking, and doing
- expand their skills through online learning

## Material

Christoph Biemann's film: *Air Is Not Nothing*

## Student materials

- My Words *Air Is Not Nothing*
- Answer sheet - My Words *Air Is Not Nothing*

## Time

60 minutes

## Realisation

Live-Online or Live in Classroom

## Air Is Not Nothing

Welcome the students and present the title of the session in English *Air Is Not Nothing* and in German *Luft ist nicht nichts*.

Explain them that you will show a short film about the topic in several parts.

Inform the students that Christoph Biemann will be talking to them in the film, and that he is the presenter of *Die Sendung mit der Maus* in Germany – a children’s TV show that has been popular for decades.

Show the students the website of *Die Sendung mit der Maus* and introduce the main character of the show – the Mouse.

### More about Christoph

[https://en.wikipedia.org/wiki/Christoph\\_Biemann](https://en.wikipedia.org/wiki/Christoph_Biemann)



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### More about the Sendung mit der Maus

<https://en.wikipedia.org/wiki/>  
<https://www.wdrmaus.de>



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Refer again to the title of the session by asking the following question: *If air is not nothing, what is it then? The answer is not easy to find, because air cannot be touched, seen, tasted, or smelled. But one can prove with experiments that air is „something” after all. Water experiments are best suited to prove this because air can be easily observed under water.*

Give the floor to Christoph, i.e. show the first sequence of the film (up to - „You can have to take it all out till the water comes out.”)

Next, talk to the students (e.g. unmute microphones) about the context in which Christoph is using the following words: *curious - neugierig / experiment - das Experiment / glass - das Glas / water - das Wasser*. Write down the words e.g. on a slide. Briefly summarize the content of the film sequence by using these words.

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Invite the students to repeat the experiment. Give them enough time to prepare the materials for the experiment. They need:

- a large glass or clear plastic bowl filled with water
- a drinking glass

Explain to the students how to conduct the experiment. The students carry out the experiment. Let them describe their observations and discuss what they have observed (e.g. unmute microphones).

### Experiment *Air is not nothing*

[https://www.simplyscience.ch/tl\\_files/content/Bilder%20Import/Experimente/Experimente%20mit%20Luft/Luft-ist-nicht-nichts.pdf](https://www.simplyscience.ch/tl_files/content/Bilder%20Import/Experimente/Experimente%20mit%20Luft/Luft-ist-nicht-nichts.pdf)

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### Explanation

*„Though the glass seems to be empty, there is air in the glass. This was proven by the experiment: In the first attempt, the air in the glass prevented water from entering the glass.*

*In the second attempt, they held the glass at an angle so that the air found a way out of the glass. Air is lighter than water and thus it rises in the form of bubbles. The resulting empty space in the glass is filled with water.“*

Ask the students whether they think that air can be filled from one glass to another or not (e.g. thumbs up).

Show the students how to do it. Follow the instructions provided in the link *Filling air from one glass to another*. Material:

- a large glass or clear plastic bowl filled with water
- two drinking glasses

### Experiment *Filling air from one glass to another*

[https://www.simplyscience.ch/tl\\_files/content/Bilder%20Import/Experimente/Experimente%20mit%20Luft/Luft-ist-nicht-nichts.pdf](https://www.simplyscience.ch/tl_files/content/Bilder%20Import/Experimente/Experimente%20mit%20Luft/Luft-ist-nicht-nichts.pdf)

Section *How can I fill air from one glass to the other?*

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Invite the students to conduct the experiment themselves and to describe and discuss their observations (e.g. unmute microphones).

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Next, invite the students to participate in a third experiment in which the students will learn how to trap air. Demonstrate how to do the experiment. Proceed as described in the link *Experiment Trapping Air*.

Materials:

- a large glass or clear plastic bowl filled with water
- a drinking glass
- a napkin

### Experiment *Trapping Air*

<https://alltagsreise.de/wie-funktioniert-eine-taucherglocke/>



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### Explanation

„There is not only a napkin in the glass, but also air. The air already fills the space in the glass, so the water cannot enter the glass and the napkin remains dry..“

Describe and discuss this experiment with the students (e.g. unmute microphones). Explain the phenomenon to the students.

Before showing the students the second sequence of the film, tell them that the ancient Greeks – as Christoph mentioned – were very curious people. They closely observed the world around them and tried to find explanations for natural phenomena. Nature means *physis* in ancient Greek, hence the word *physics*.

Ask the students

- whether they know the exclamation *eureka* (in German *Heureka*) and
- if they know where this word comes from (ancient Greek) and what it means (*I found it!*).

Tell them that Archimedes, one of the greatest scientists in ancient Greek – is said to have used this exclamation. He used it once out of sheer enthusiasm. Use the following source as reference [geo.de](https://www.geo.de).

Watch Christoph demonstrate the experiment Archimedes had performed. Start the film (from - „*And one fine day, a very, very famous old Greek, his name was Archimedes ...“* until - „*... is put away by the air. It seems to be that where there is one body there can be no other*“).

### Source

<https://www.geo.de/geolino/redewendungen/18815-rtkl-redewendung-heureka-ich-habs-gefunden>



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After watching the film, summarize what they discovered: *Air is not nothing. It is a substance that has volume and takes up space.*

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Introduce the third sequence of the film by asking whether clay (plasticine) floats or sinks in water. The students share their ideas.

Show the film (from - „So that's the next experiment. This is plasticine.“)

After watching the film, discuss the result with the students (e.g. unmute microphones). Explain why the ball made of plasticine sinks and the boat made of plasticine floats on the water. Refer to the experiment *Plasticine boat and Plasticine ball* while explaining the difference.

### Experiment *Plasticine boat and Plasticine ball*

<https://www.nela-forscht.de/2012/07/11/knetboot-und-knetkugel-im-vergleich/>



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### Explanation

„Plasticine has a higher density than water and therefore sinks as a compact plasticine ball. But why doesn't the boat sink? Yet the weight of the ball and the boat is the same! But the shape is different! The plasticine boat is larger than the ball and hollow inside. This means that air, which is light, is present but invisible. Therefore, the boat - which is filled with air - suddenly has a lower density than water.,,

Invite the students to repeat the experiment.

Material:

- a large glass or clear plastic bowl filled with water
- a drinking glass
- plasticine

First, observe how the plasticine boat floats on the water. Then pour water into the boat to see how it sinks when the water displaces the air, which is light. Discuss this with the students (e.g. unmute microphones).

Share the sheet *My Words Air Is Not Nothing* with the students (interactive pdf).

## Air Is Not Nothing

Then ask the students to complete the sentences. The sentences briefly summarize the topic. Explain that it is worth learning new words in context and memorizing short, interesting texts. Making relevant connections that can be easily recalled from the memory is helpful when speaking German.

With younger students you can play a game to practice the words rather than using the worksheet, e.g.

- Say the first syllable of the word and ask the children to finish the word.
- Articulate the word without sound and have the children read it from your lips.
- Act the words out and have the children guess them out.

With older students the games can be played in addition to the filling out the worksheet.

### Additional project:

Experiment *Archimedean Principle*

### The Archimedes Experiment

<https://physikforkids.de/geschichte/archimedes/die-loesung-in-der-badewanne/das-experiment-zu-archimedes-teil-1>  
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## Air Is Not Nothing

### My Words *Air Is Not Nothing*

#### English

#### Deutsch

#### Merkhilfe

air  
curious  
experiment  
glass  
water  
famous  
body  
plasticine  
swim  
lighter than

Die alten Griechen waren sehr \_\_\_\_\_. Sie wollten alles über die Natur wissen. Sie haben beobachtet, dass \_\_\_\_\_ nicht nichts ist.

Das kann man mit einem einfachen \_\_\_\_\_ beweisen. Man sperrt Luft mit einem \_\_\_\_\_ in einer Schüssel voll \_\_\_\_\_ ein. Lässt man die Luft aus dem Glas langsam heraus, sieht man, wie die Luftblasen im Wasser hochsteigen.

Archimedes wurde \_\_\_\_\_ als einer der größten Naturwissenschaftler der alten Griechen. Er erkannte, dass Luft sich wie ein \_\_\_\_\_ verhält. Sie hat Volumen und nimmt Raum ein.

Ein interessantes Experiment kann man mit \_\_\_\_\_ durchführen. Knete als Kugel sinkt, Knete als Boot kann aber \_\_\_\_\_. Warum? Denn Luft ist \_\_\_\_\_ Wasser und die Form ist auch anders.

# Air Is Not Nothing

## Answer sheet - My Words Air Is Not Nothing

| English      | Deutsch        | Merkhilfe |
|--------------|----------------|-----------|
| air          | DIE LUFT       |           |
| curious      | NEUGIERIG      |           |
| experiment   | DAS EXPERIMENT |           |
| glass        | DAS GLAS       |           |
| water        | DAS WASSER     |           |
| famous       | BERÜHMT        |           |
| body         | DER KÖRPER     |           |
| plasticine   | DIE KNETE      |           |
| swim         | SCHWIMMEN      |           |
| lighter then | LEICHTER ALS   |           |

Die alten Griechen waren sehr NEUGIERIG. Sie wollten alles über die Natur wissen. Sie haben beobachtet, dass LUFT nicht nichts ist.

Das kann man mit einem einfachen EXPERIMENT beweisen. Man sperrt Luft mit einem GLAS in einer Schüssel voll WASSER ein. Lässt man die Luft aus dem Glas langsam heraus, sieht man, wie die Luftblasen im Wasser hochsteigen.

Archimedes wurde BERÜHMT als einer der größten Naturwissenschaftler der alten Griechen. Er erkannte, dass Luft sich wie ein KÖRPER verhält. Sie hat Volumen und nimmt Raum ein.

Ein interessantes Experiment kann man mit KNETE durchführen. Knete als Kugel sinkt, Knete als Boot kann aber SCHWIMMEN. Warum? Denn Luft ist LEICHTER ALS Wasser und die Form ist auch anders.