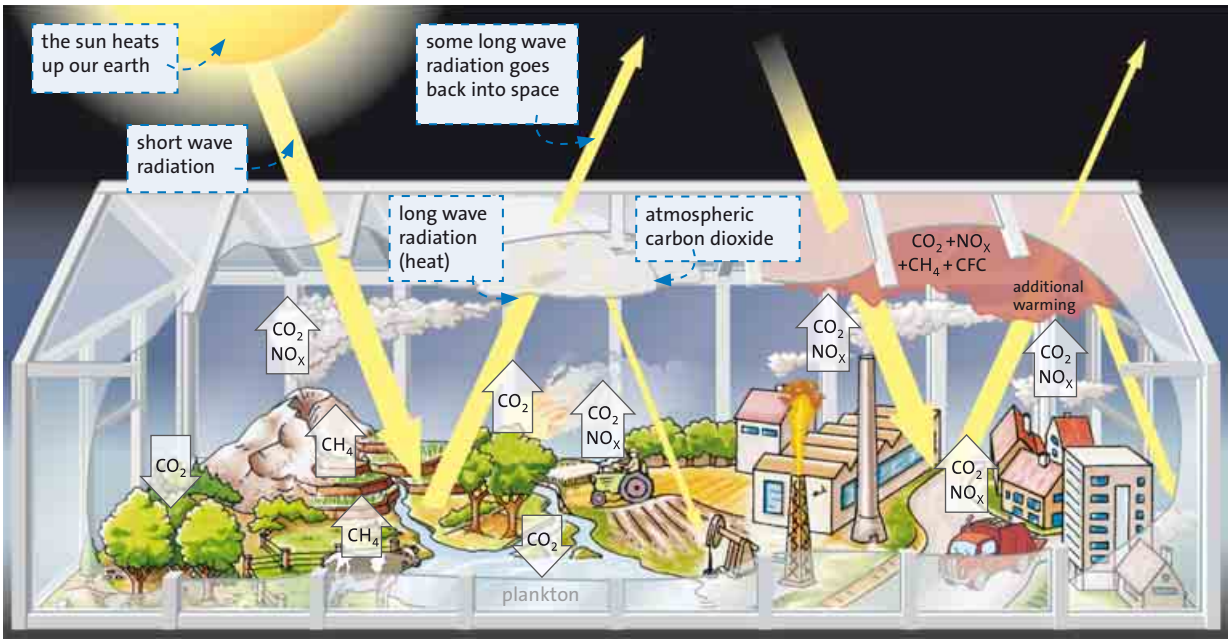


1 **Natural and man - made greenhouse effect**

CFC
FCKW
solar radiation
Sonneneinstrahlung
layer
Schicht
ozone layer
Ozonschicht
air pressure
Luftdruck
greenhouse
Treibhaus
sunray
Sonnenstrahl
short/long wave radiation
kurzwellige / langwellige Strahlung
to sweat
schwitzen
to reflect
zurückstrahlen
to absorb
aufnehmen, absorbieren
natural/man-made greenhouse effect
natürlicher / menschgemachter Treibhauseffekt

Atmosphere and solar radiation

What is the atmosphere?
The **atmosphere** is a thin layer of gases around the earth (see figure 4). These gases are important because they make the earth warmer (about 15°C), without these gases the temperature would only be - 18°C.
The earth's atmosphere is about 480 km and has different layers: the troposphere is where all the weather takes place and where we live. The stratosphere with the **ozone layer.** The mesosphere and the thermosphere (see figure 3).

Air pressure
The **air pressure** outside a plane is a lot less than the air pressure on the ground. There is no exact place where the atmosphere ends, it just gets thinner and thinner.
The unit to describe the air pressure per m² is hPa which stands for Hectopascal. You can often see hPa on weather maps. They are important for meterologists who tell us what the weather will be like in the next few days.

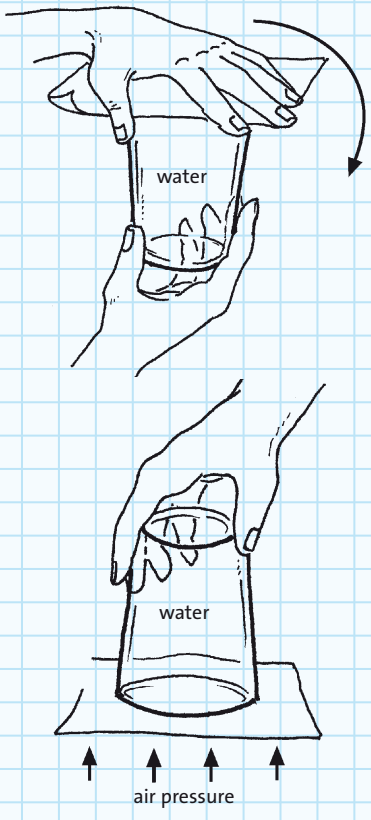
Way of the incoming sunlight
The way of the incoming sunlight can be compared to a greenhouse. Have you ever been in one? It is really hot in there. That's because the sunlight goes through the glass of the greenhouse and the sunrays cannot get out. It gets warmer and warmer inside and the plants can grow a lot faster.
Have a look at figure 1 it shows the way of the incoming sunlight on earth. The sun sends off sunrays (**short wave radiation**). They move through the atmosphere and change into **long wave radiation** (heat) when they reach the ground. Your body is the same in the sun on a hot summer day. Your skin is hit by sunlight and you start to feel warm and sweat.
When the sunrays reach the ground the radiation is reflected and some long wave radiation goes back into space while other is absorbed by the **carbon dioxide** in the atmosphere and warms up the earth. This is called the **natural greenhouse effect**. People also talk about the **man-made greenhouse effect**. What do you know about it?

Air pressure experiment

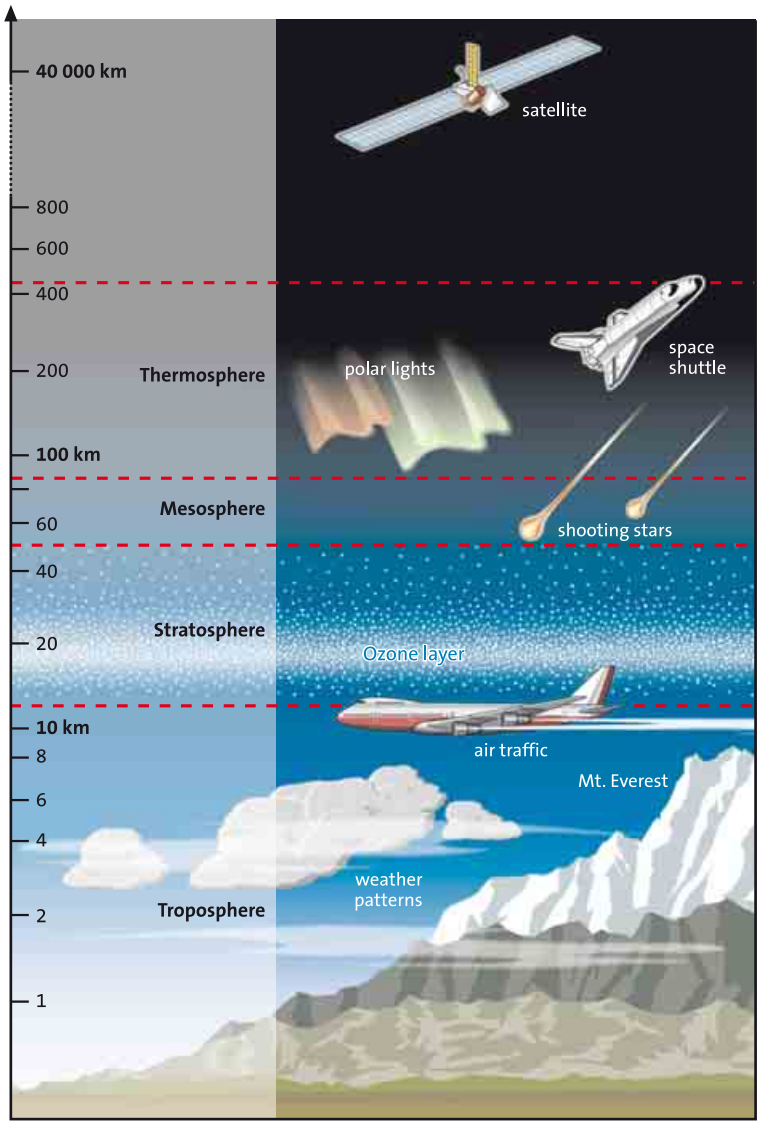
What you need:
a glass of water, a cardboard sheet

What to do:
1. Fill a glass with water and cover it with a cardboard sheet.
2. Turn the glass upside down, but do not forget to press the cardboard to the glass while turning it!
3. When the glass is upside down, take your hand away.

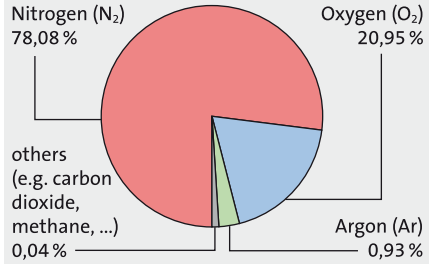
Results:
What happens?
Try to explain!



2 **Air pressure experiment**



3 **Layers of the atmosphere**



4 **Gases in the atmosphere**

nitrogen
Stickstoff
fossil fuels
fossile Brennstoffe

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How to analyse charts

1 Explain the natural greenhouse effect in your own words.

2 Discuss in which way the burning of fossil fuels from cars or factories may change the temperatures on earth.