

Our Earth – the blue planet



The genesis

1. About 4.5 million years ago, our planet formed from comets, asteroids, gas and dust. For this to happen, everything was pressed together by gravity - so much so that high pressure was created inside. This pressure caused the rock to heat up until it even melted. The earth's surface remained very hot for several hundred million years and could not solidify.
2. In addition, more and more meteorites hit the earth. This heated it up again and again and it remained liquid. For a long time, our Earth consisted only as a sea of fire made from liquid rock - it was a big glowing ball. The temperature at the surface was about 4,700 °C.
3. After several million years, the meteorite impacts subsided and the temperatures on the Earth's surface dropped. This allowed the rock to solidify and the earth's crust to form. At that time, the moon was also formed and became the Earth's constant companion. However, a day was only 6 hours long.
4. Over time, the earth's crust became thicker and thicker. Compared to the hot interior of the Earth, the outer crust was still only a thin layer.
5. After some time, the Earth's crust cooled so that water could accumulate on the surface. Scientists assume that asteroids carried the water to Earth. However, there was still no oxygen. The temperature at that time was around 55 to 88 °C.
6. Life on Earth only had a chance when the ozone layer was formed. This is because it protects the earth's surface from dangerous radiation.

Did you know that
a prerequisite for
life is water?



The structure of the earth

Our earth consists of several layers. You can imagine the structure like a nectarine. The outer layer is the earth's crust. This is followed by the mantle, then the outer and lastly the inner core. The Earth's core is about 6,371 km from the surface. About every 100 m, the temperature increases by 3 °C. The inner core is very solid because the pressure is highest at this point. All layers of the Earth press on the inside of the core.

The earth's crust

> Continental Earth Crust:

- Is the uppermost crust on which we stand
- Approx. 70 km deep
- Condition: solid

> Oceanic earth crust:

- Is the crust beneath the oceans
- Approx. 5 to 8 km deep
- Condition: solid

The Earth's mantle

> Upper mantle

• Upper part:

- Temperature: approx. 1,000 °C
- Approx. 40 km deep
- Condition: solid

• Lower part:

- Temperature: approx. 2,000 °C
- Approx. 70 to several 100 km deep
- State: liquid
- Above a temperature of approx. 1,300 °C, consists of Magma (molten rock)

> Lower Earth Mantle

- Upper part is very viscous (between solid and liquid) and approx. 700 km deep
- Lower part is also very viscous and approx. 3,600 °C hot
- The two parts move and heat exchange occurs



Find us on:



www.bresser-junior.com

Our Earth – the blue planet

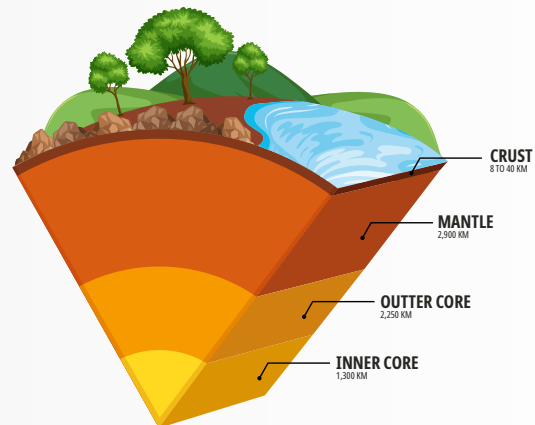
The core

> Outer core

- Temperature: approx. 4,000 °C
- Approx. 3,000 km deep
- Condition: liquid

> Inner core

- Temperature: approx. 5,500 °C
- Approx. 5,000 km deepff
- Condition: solid



The Earth's Sphere

The atmosphere is a gas envelope that surrounds and protects the Earth. The higher we move in it, the lower the air pressure becomes. The atmosphere consists of several layers, each with different temperatures.

> Troposphere

- The complete water cycle takes place here
- Temperature at the upper boundary: -80 °C

> Stratosphere

- This is where the ozone layer is
- Height: approx. 15 km
- UV radiation is converted into heat here
- Temperature at the upper boundary: approx. 0 °C

> Mesosphere

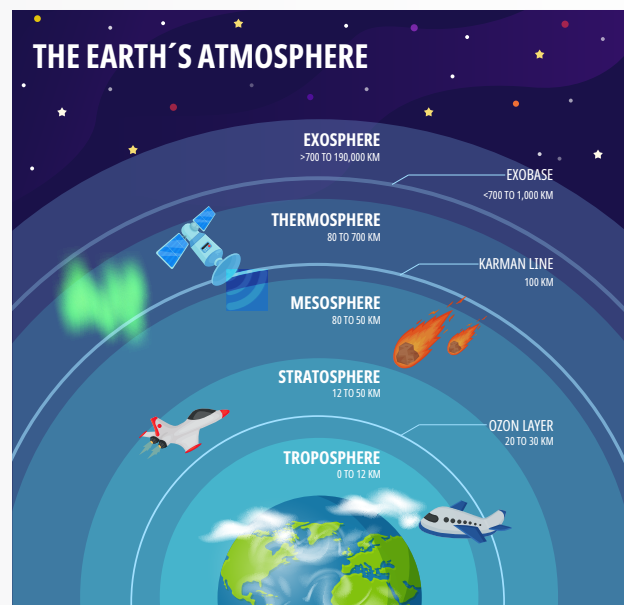
- From approx. 50 km
- Here, dust particles or small pieces of rock burn up and become shooting stars.
- Temperature: -100 °C

> Thermosphere

- From approx. 85 km
- This is where the ISS and space shuttles fly
- Temperature: up to approx. 1,700 °C

> Exosphere

- From approx. 500 km above the Earth's surface
- Gravity decreases here
- The further you move away from Earth, the lower the temperature drops



Find us on:



www.bresser-junior.com