



## WebQuest

Advanced level

My Carbon Budget





WEBQUEST NAME:

My Carbon Budget

WEBQUEST LEVEL:

Advanced level

## INTRODUCTION

What exactly is a WebQuest? A WebQuest is a research activity that allows you to learn new interesting things and acquire knowledge. At the beginning of each WebQuest you will be given some tasks and you will try to complete these tasks as a real scientist. You will search the Internet, where you will gradually find all the information that will help you fulfil your scientific tasks. Each WebQuest has different tasks and a different topic.

This WebQuest is called "My Carbon Budget". Let's start with an interesting fact. Artificial intelligence technology has one dark side. It turned out that the carbon footprint of training a single AI is as much as 284 tonnes of carbon dioxide equivalent – five times the lifetime emissions of an average car! Artificial intelligence training is very demanding for computer operation. Neural networks need a huge amount of computing power and that requires a lot of energy which creates a carbon footprint.

Your first task in this WebQuest will be to find out what is a carbon footprint.

Your second task will be to find out who is most involved in creating the carbon footprint.

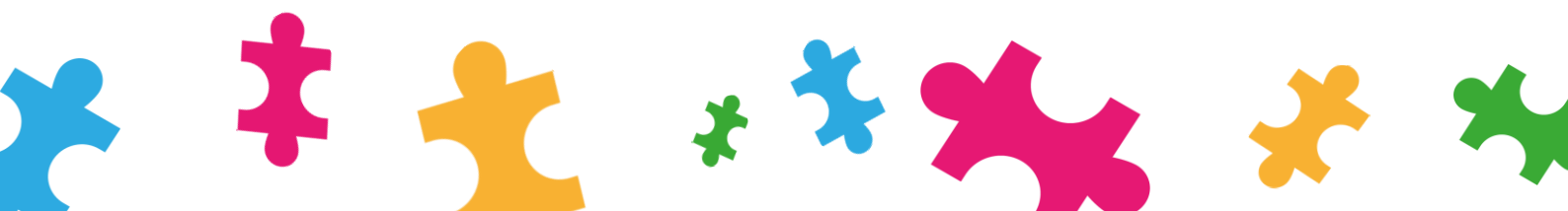
Next, you will try to find out how carbon footprint affects the environment.

The fourth task will be to find out how is carbon footprint measured.

The last task will be to find out how to reduce the carbon footprint.



**GET INTO IT!**





## TASKS

This WebQuest will make you a carbon footprint expert. You will be able to discuss the carbon footprint and you will be able to tell a short story about it. A story about what the carbon footprint is, who or what causes it, how the carbon footprint affects the environment, how is it measured and how to reduce it. Create the story about the carbon footprint by completing the following tasks. Make short notes to tell the story at the end of WebQuest.

### TASK 1.

What is the carbon footprint?

### TASK 2.

Find out who or what creates the carbon footprint.

### TASK 3.

Find out how the carbon footprint affects the environment.

### TASK 4.

Find out how is the carbon footprint measured.

### TASK 5.

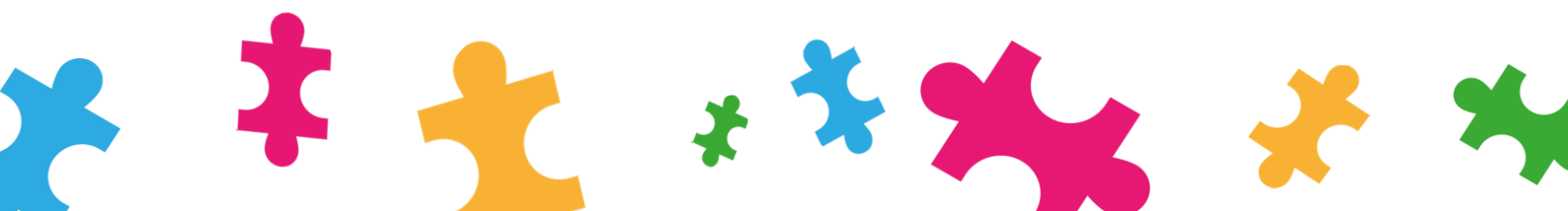
Find out what we can do to reduce the carbon footprint.

## PROCESS

### TASK 1.

Read this article and explain what the carbon footprint is.

<https://www.celakovice.cz/cs/mesto/zivotni-prostredi/informace/co-je-uhlikova-stopa.html>





If you're not sure what a carbon footprint is, watch a video in which one brave young man explains the carbon footprint and gives an example. Just watch the first 5 minutes.

[https://www.youtube.com/watch?v=WAMcJ5\\_NXLY&ab\\_channel=Tade%C3%A1%C5%A1%C4%8Cech](https://www.youtube.com/watch?v=WAMcJ5_NXLY&ab_channel=Tade%C3%A1%C5%A1%C4%8Cech)

The carbon footprint is the total greenhouse gases emissions, expressed as carbon dioxide equivalent (CO<sub>2</sub>) caused by an individual, a product or an action. It is often used in connection with products. It expresses the sum of all greenhouse gases, that have been emitted during the production of a particular product.



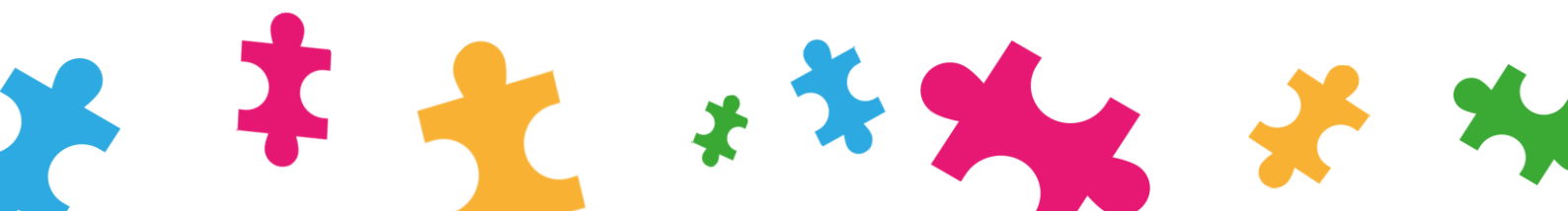
## TASK 2

Find out who or what creates the carbon footprint.

As mentioned above, the carbon footprint refers to a product or action, but it is a result of human needs. Simply put, the carbon footprint is created by man.

The carbon footprint is divided into direct and indirect. The direct carbon footprint is the amount of greenhouse gases emitted during activity (in the production of electricity, heating, gas emissions while driving a car ...). Indirect carbon footprint is the amount of greenhouse gases emitted during the entire product life cycle - from manufacturing to eventual disposal.

And what are the sources of the carbon footprint? What industry is the biggest contributor to the carbon footprint? What do you think?





Who is the "winner" of the carbon footprint? The ranking is from 2010.

- energy and heat production - up to  $\frac{1}{4}$  global emissions
- agriculture - 24% - emissions from:
  - tillage (rice fields around the world leave a carbon footprint like 200 coal-fired power stations)
  - animal husbandry
- industry - 21%, It has been stated that around 5% of total global emissions come from the fashion industry, which is more than air and maritime transport!
- and transport 14% (air, road, rail, maritime)

You did a great job with the second task!

Let's do the third task.

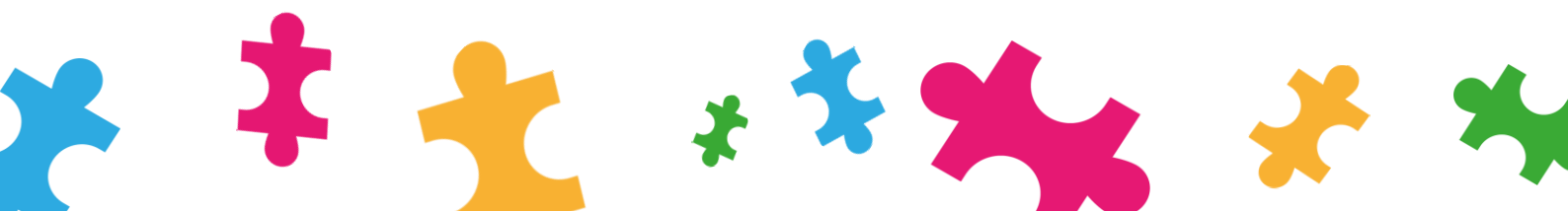


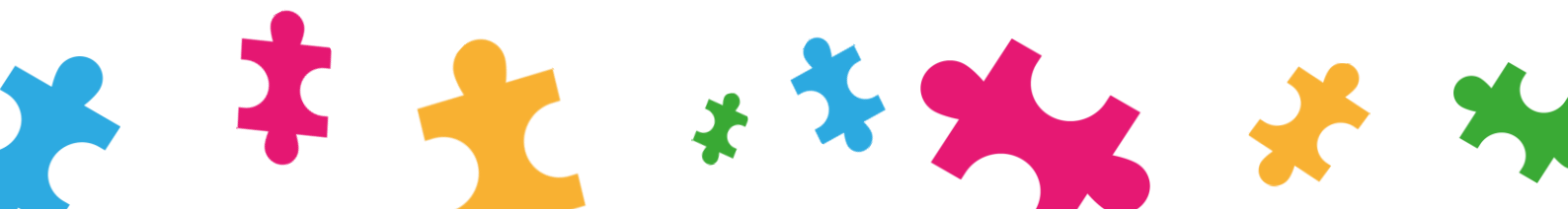
## TASK 3

Find out how carbon footprint affects the environment.

The carbon footprint is the amount of carbon dioxide (CO<sub>2</sub>) that is released into the air, e.g., by power plants, agriculture, industry, transport. In short, due to the huge amount of CO<sub>2</sub> released into the atmosphere, our planet is warming. What are the effects of a rising temperature?

Look at the following pictures and try to explain how each picture refers to the Earth's warming and the carbon footprint.







Emissions of carbon dioxide into Earth's atmosphere are responsible for the global warming. Rising temperatures cause ice melting, which means that ocean levels are rising, and the land is covered with water. On the other hand, some areas must face a severe water shortage, because the water dried up. Nowadays, in some places, there are no rivers or lakes left, just the dried- up soil. And the dried-up soil does not provide suitable conditions for growing crops, so in these barren areas people are starving and are forced to move on to another place to survive. Because of the high concentration of carbon dioxide in the air, extreme weather events are likely to become more prevalent. For example, tropical storms or large-scale forest fires. This, of course, affects the animals because they live in nature - for example, koalas bears die in forest fires or melting of the Arctic Sea threatens polar bears survival.

You also managed the third task of this WebQuest perfectly!



## TASK 4

How is the carbon footprint calculated?

The carbon footprint of an individual or institution, state, industry, activity, or city is calculated by summing the amount of greenhouse gases produced from all the activities that the person or entity makes. Greenhouse gases are deduced from the amount of energy consumed (for example, the amount of burned gasoline or coal).

Watch the video in which you find out how the carbon footprint is measured.

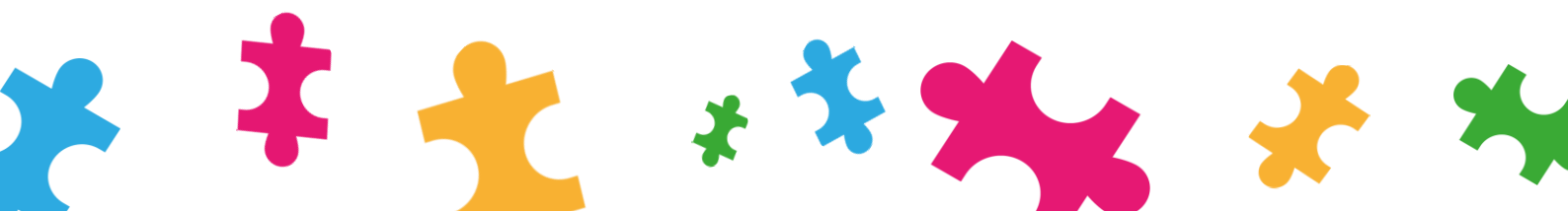
[https://www.youtube.com/watch?v=UUILCBrZdV4&ab\\_channel=MetropolTV](https://www.youtube.com/watch?v=UUILCBrZdV4&ab_channel=MetropolTV)

An air quality meter might look like this.



Now ask someone in your family to help you calculate the carbon footprint of the household which you live in. Open the following link, in which a calculator will make it easier for you.

<https://uhlikovastopa.cz/kalkulacka>





## TASK 5

Find out how we can reduce the carbon footprint.

One of the many solutions on how to reduce the carbon footprint is to use CCS technology. You can find out what it is in this video.

[https://www.youtube.com/watch?v=RIKKBiFw0A&ab\\_channel=%C4%8Cesk%C3%A1geologick%C3%A1slu%C5%BEba](https://www.youtube.com/watch?v=RIKKBiFw0A&ab_channel=%C4%8Cesk%C3%A1geologick%C3%A1slu%C5%BEba)

You can reduce your carbon footprint. The most important thing to do is to stop wasting - food, water, electricity, etc. Start with walking or cycling and not going by car. Or you can change your eating habits a little bit - eat less meat and more vegetables and fruit.

We can also compensate the carbon footprint. This way is called "Carbon offset". In the following video, you will learn what this term means.

[https://www.youtube.com/watch?v=6NGKbdtJ0Vw&ab\\_channel=Ci2%2Co.ps](https://www.youtube.com/watch?v=6NGKbdtJ0Vw&ab_channel=Ci2%2Co.ps)

This is the end of the WebQuest about the carbon footprint. To prove that you know something about this topic, try to tell a short story. A story about what the carbon footprint is, who creates it, how the carbon footprint affects the environment, how is it measured and how to reduce it. If you can tell the story, it proves that you already know a lot about the carbon footprint.

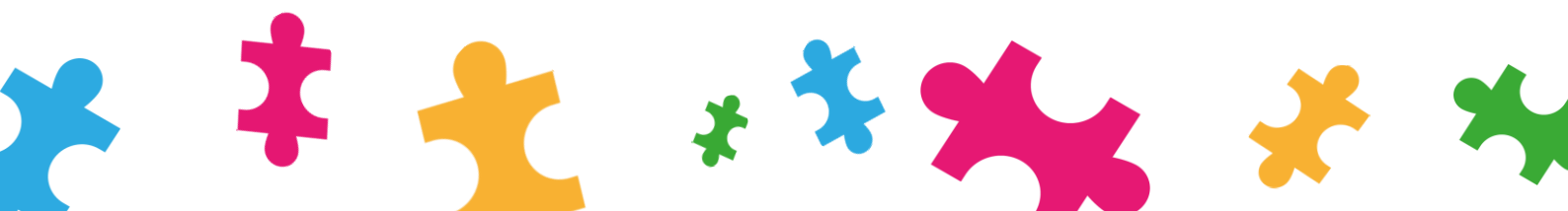
You also accomplished the last task of this WebQuest perfectly.



## EVALUATION

You have successfully completed several tasks in this WebQuest. Try to answer the following questions:

- Which knowledge from this WebQuest was just a repetition for you, because you already know the answer to it?
- What knowledge was new to you?
- Why should people have the knowledge contained in this WebQuest?
- If you had to tell someone a few words about the carbon footprint, what would you say?



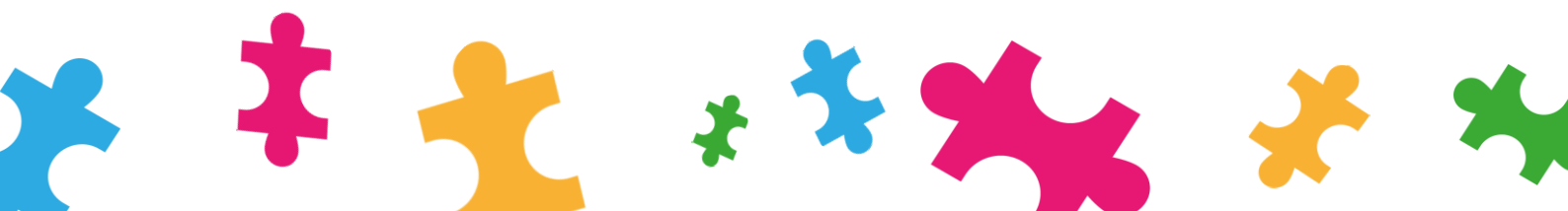




## CONCLUSION

In this WebQuest, you gained new knowledge about the carbon footprint. You know what the carbon footprint is, who creates it, what impact it has on the environment, how the carbon footprint is measured and what you can do to reduce the carbon footprint or how to compensate it.

Congratulations, your knowledge of the carbon footprint is very good now!





# GRETA

**Challenge-based Learning in Primary Schools for Climate Change Awareness**



Istituto Comprensivo "Don Milani" di Lanciano



Co-funded by the  
Erasmus+ Programme  
of the European Union

"The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein."

Project Number: 2020-1-EL01-KA201-078808

