

What triggers climate action: The impact of a year-long CCE program on students' climate literacy and their willingness to act

Supplementary material 1 – Online questionnaire (translated from Czech)

Section 1 – What is climate change/global warming?

1. Planet Earth is warming because... (tick all correct options):

- ... there are sunspots in the sun, the sun radiates more heat.
- ... the amount of greenhouse gases in the atmosphere is increasing.
- ... the earth 's core is heating up.
- ... the ozone layer functions as a greenhouse around the Earth.
- ... holes in the ozone layer let more heat from the sun go through.
- ... the ice age is ending.
- ... more thermal radiation reflected from the Earth remains in the atmosphere.
- ... the Earth's orbit around the Sun has changed.

2. Global warming / climate change has the following impacts (tick all that apply):

- rising ocean levels
- rising temperature (atmosphere, oceans, earth's surface)
- frequent volcanic eruptions and earthquakes
- melting ice (for example in the polar regions)
- heating of the Earth's core
- less oxygen in the atmosphere
- lack of water and food
- more extreme weather (hurricanes, heat waves...)
- skin cancer
- enlarging holes in the ozone layer

3. Try to give examples of the effects of global warming / climate change in the Czech Republic and your surroundings, or write "I don't know":

4. The following activities contribute the most to global warming / climate change (tick 4 best options):

cutting down and burning of rainforests

more and more plastics in the oceans

use of fertilizers

cattle breeding (cows, sheep)

killing of protected animals

driving a car, travelling by airplanes

burning of coal, oil and natural gas

pollution of water and soil by harmful substances

5. Try to give examples of activities from your surroundings (your daily activities, family, school, city...) that contribute to global warming / climate change, or write "I don't know":

Section 2 - How much will these activities mitigate global warming / climate change?

Think about the following examples of human activities and try to assess how much they will help us mitigate global warming / climate change.

(tick one option)

turning off the light when not needed

just a little or not at all / not really / pretty much, considerably / very much / I don't know

use of solar and wind energy

just a little or not at all / not really / pretty much, considerably / very much / I don't know

using as few plastics as possible

just a little or not at all / not really / pretty much, considerably / very much / I don't know

ending of combustion of coal, oil, natural gas

just a little or not at all / not really / pretty much, considerably / very much / I don't know

growing your own vegetables and fruits

just a little or not at all / not really / pretty much, considerably / very much / I don't know

waste sorting and recycling

just a little or not at all / not really / pretty much, considerably / very much / I don't know

reducing air / car traffic

just a little or not at all / not really / pretty much, considerably / very much / I don't know

eating less meat

just a little or not at all / not really / pretty much, considerably / very much / I don't know

measures for buildings / households such as insulation, use of energy-saving devices, smart heating...

just a little or not at all / not really / pretty much, considerably / very much / I don't know

planting trees

just a little or not at all / not really / pretty much, considerably / very much / I don't know

Section 3 - Is global warming / climate change a serious problem?

(tick one option)

People around me (classmates, family, neighbours...) and in my town should be more concerned about global warming / climate change.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Global warming / climate change is the most important issue today.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I don't think much about global warming / climate change, it's not an important topic for me.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

The threats of global warming / climate change are exaggerated.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Global warming / climate change is having a negative impact on our lives.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Global warming / climate change will greatly affect future generations.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I'm afraid of how the climate is changing.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Global warming / climate change will affect our environment over the next ten years.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Section 4 - What do you think of the following statements??

(tick one option)

There are definitely things I can do to help mitigate global warming / climate change.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I believe I could suggest how my school could reduce its carbon footprint.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Personally, there is nothing I can do about global warming / climate change, there is no point in trying to do that.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I am convinced that I can discuss global warming / climate change and its mitigation (with classmates, parents, friends...).

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I am able to participate actively in addressing the causes and impacts of global warming / climate change.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

The things I will do to mitigate global warming / climate change will have little effect.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I believe I can persuade people around me (parents, school principal, mayor...) to reduce their carbon footprint.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Section 5 - How willing are you to be involved in climate protection, global warming mitigation??

(tick one option)

I am willing to wear a sweater and warm socks and have a few degrees lower temperature at home in the winter.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Even though it is more complicated than using a car, I try to travel by public transport (bus, train...).

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Although I will not always have the most fashionable things, I only want to buy things that I really need.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

If it is not too far, I will be glad to walk (e.g. to school, to the store, to see friends, to the playground ...).

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I am willing to reduce the time of using electrical devices (mobile phone, computer, tablet, television ...).

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

I will be glad to eat less meat.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Although it means extra work, I want to get as much information as possible on how I can contribute to global warming / climate change mitigation (climate protection).

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

In my free time, I want to take part in activities that address global warming / climate change (climate protection) at school and in my town/community.

I agree / I rather agree / I'm not sure how to decide / I rather disagree / I do not agree

Section 5 - To conclude the questionnaire

(tick one option / answer the question)

Thank you very much for filling out the questionnaire, your answers will definitely help us. We would also like to ask for some data that will guarantee the correct evaluation of the questionnaire and the processing of results.

I am... a girl/ boy

I am... 12 years old / 13 years old / 14 years old / 15 years old / 16 years old / 17 years old

I attend...

elementary school (7th grade) / elementary school (8th grade) / elementary school (9th grade)

secondary school (1st grade) / secondary school (2nd grade) / secondary school (3rd grade)

In what city do you go to school? _____

Finally, we would like to ask you to create a unique code we need for anonymous processing of results.

The first letter of your first name (example: Karel Novák chooses K): _____

Which day of the month were you born (example: Karel was born on July 17th, he selects 17):

The first letter of your last name (example: Karel Novák chooses N): _____

Supplementary material 2 – Focus group interviews (translated from Czech)

Interviews with student focus groups (6 groups, N=27)

1. You have spent a whole school year with the CO₂ League. If you had to choose the strongest CO₂ League experience, what would it be?
2. What led you to decide to join the CO₂ League team?
3. What did your work in the CO₂ League team usually look like?
4. Sometimes everything goes smoothly, other times not. What problems have you encountered while working in the CO₂ League?
5. Some teams work mostly alone, others have a lot of help from the teacher. How did it work for you?
6. How do you think you have changed due to joining the CO₂ League?
7. What did you learn from it?
8. How did you manage to translate things you have learned and activities you have done in the CO₂ League into your normal life? Did you start doing something different?
9. Imagine being able to change anything in the CO₂ League (how the CO₂ League works, assigning missions, completing missions, handing in the completed tasks etc.). What would you suggest?
10. Anything you would like to add?

Interviews with teachers (N=6)

1. How many times have you already participated in the CO₂ League as a team leader?
2. If you had to choose the strongest CO₂ League experience, what would it be?
2. Project learning and place-based learning, applied in the CO₂ League, are for some teachers rather a novelty or supplement to traditional learning. Other teachers commonly use these methods in their teaching. How is it with you?
3. What do you think prevents your school from making these approaches more widespread?
4. Projects such as the CO₂ League are often run by teachers who have the most insight into what to do. But sometimes school students manage more or less themselves and the teacher just facilitates them. How was it for you?
5. What problems did you encounter in completing each mission?
6. What do you think the CO₂ League has brought to your pupils?

7. What makes them different than before the start of the project?
8. What did the involvement bring to you? Has it influenced your teaching practice and the way you conduct lessons?
9. Is there anything you would suggest to change in the CO₂ League (how the CO₂ League works, assigning missions, completing missions, handing in the completed tasks etc.).
10. Anything you would like to add?