temperaTOUR: An effective method to teach youth their own connection to the topic of Global Warming

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Name of Activity temperaTOUR	**Total time** A workshop consists of 90 minutes.
Overview The name of the activity explains the ethos of the method–a learning on the move. Tempera: Because it is about the rising temperature in the world. TOUR: Because the workshop does not take place in a classroom, but in the city where we walk from location to location during the 90 minutes of the workshop.	**Materials/room** Photos and customised props (foam cubes, food dummies).
Number of people Any	**Target groups & Age** Teenagers in the ages of 13 to 18.
Learning outcomes Making the youth aware of own connections to the topics of Global Warming, Climate Change and other environmental issues and showing them how they could counter it or contribute to reducing the negative effects.	

PART I: The background to the Method

Content background:

Fighting Global Warming – a worldwide test of humanity, foresight and intelligence

Climate change is a world-wide topic that does not stop at any border. It is a problem that will influence our future more than we can imagine today. It connects people in all parts of the world as creators of the problem and at the same time as victims of it.

The only difference between us on earth is how much we are going to be effected by global warming and how much we are part of the creation of it.

For example in Malawi, the climate-change is creating shorter rain-seasons and that causes massive problems for the small-scale farmers. An average Malawian has a CO2 Emission of 0,07 tons per year. On the other hand, the temperature rising has not had a big impact so far on Germany. In the future the impact will not be that strong either. In addition, Germany has the financial and technical resources to address the problems that will come up. A German approximately produces 9,4 tons of CO2 per year, the same amount that 100 Malawians produce together. 70 – 80 % of all human made climate gas-emissions so far were produced in the industrial countries.

The ones who are creating the climate problems are usually not the ones who are going to suffer the most.

Fighting global warming is probably the best test to see, if we as humans can manage to be a solidary species. Are we able to change our lifestyle to help people we do not know, since they live far away or are going to live in the following generations?

Education about Global Warming is a challenge

In general people know about global warming, its effects, how it is created and what we could do to fight it. Although people do not know about it in detail, everybody, at least in Germany, where our organization is working, knows that driving a car is not good for the climate and that going by plane is even worse. Furthermore, people know that saving electricity is good for the climate; still this does not change the behavior of people.

As an environmental youth organization, which works with young people on this topic, we had to question ourselves:

• If young people already know something about global warming, how can we still draw their interest?

• If the impact of the behavior on global warming is invisible, for example when you take the car and you do not see how you raise the CO2-Emission, how can we make its effect more visible and understandable?

The solution was to:

• Use an unusual setting for your teaching

• Do it close to peoples personal life

• Teach them in places where the decision is made if they want to be part of the problem or part of the solution, for example in the shopping street

• Make it interactive and entertaining

The goal and the target group:

The goal was to reach teenagers in the age from 13 to 18 and to inform them, what climate is, what kind of activities affects the climate and what we can do in our personal life to protect it. The best way to reach this target group is to offer a workshop to schools and to invite school classes to participate.

The title of the project: temperaTOUR

Tempera: Because it is about the rising temperature in the world.

TOUR: Because the workshop does not take place in a classroom, but in the city where we walk from location to location during the 90 minutes of the workshop.

Place of activity

We are meeting the school class, for example in the city centre, ideally in a place with some space and without too much of disturbance.

PART II: The Method

The start:

Climate and weather

After welcoming the group of participants and introducing ourselves, the first question is:

Do we have good weather or good climate today?

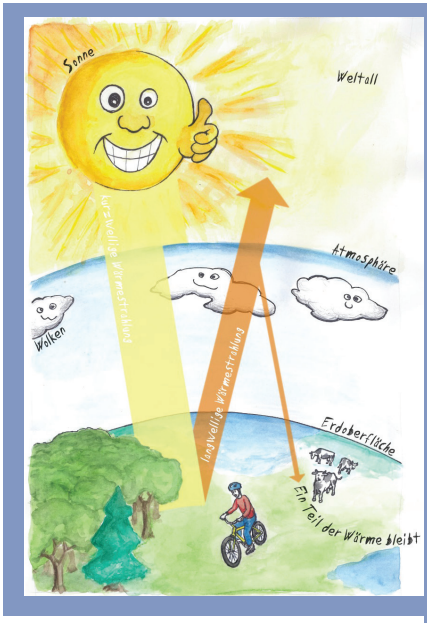
Some answers of the participants are collected and discussed.

Answer: The weather is changing from day to day; the climate

is not. The average weather of 30 years of a certain region is the climate of this region.

Through the following three pictures the Greenhouse-effect is explained to participants. Because the topic is usually not new for pupils, it should not take much time.

How does a climate catastrophe occur?



Sonne – Sun
Weltall – outer space
Atmosphäre - atmosphere
Wolken - clouds
Erdoberfläche - earth's surface
Kurzwellige Wärmestrahlung - short-wave thermal radiation
Langwellige Wäremstrahlung – long-wave thermal radiation
Ein Teil der Wärme bleibt – a part of the heat stays
Treibhausgase sammeln sich - Greenhouse gases accumulate
Wärme staut sich - Heat accumulates
Erdoberfläche heizt sich auf - Earth's surface heats up

Most important messages:
The Green-house effect is a natural process and it is good to have it.

Because of the Greenhouse-effect the average world-wide temperature is 15C. Usually, to be more interactive, the group is asked to guess the average-temperature of the world, combining all countries and all seasons.

Without the Greenhouse-effect it would be much colder on earth. Again you could ask the participants to guess. That way they stay interested.

-18C would be the correct answer.

Final message:

The Greenhouse-effect as it is right now makes our life possible on earth. But through driving a car, putting the light on, buying a plastic bag, we are producing climate gases and their effect is the same as at night in bed. "You are in bed, the blanket is perfect, and you are not freezing and not too hot. The blanket is your Greenhouse-effect. Through industrialization we are putting a thin blanket on top of yours, and another thin one, and another … With each blanket it is now slowly getting warmer and warmer for you. That is what is happening with our planet right now.

What is creating the human made Global Warming?
If we do want to do something against the climate change, we need to know what is creating the climate change in the first place.

Seven big photos are now placed next to each other on the ground, representing the main seven sources, which are creating the global warming.

These are:

- Electricity
- Industry
- Change of land-use, for example the destruction of the rainforest
- Agriculture
- Traffic
- Heating and Cooling of houses
- Waste

Now you hand out cards with percentages that the group needs to connect to the pictures.

They are: 26%, 19%, 17%, 14%, 13%, 8%, 3%

Now a discussion between the participants about what affects the climate worldwide more and what less should start.

The right answer would be:

Electricity: 26%
Industry: 19%
Change of land-use, for example the destruction of the rainforest: 17%
Agriculture: 14%
Traffic: 13%
Heating and Cooling of houses: 8%
Waste: 3%

(IPCC Fourth Assessment Report: Climate Change 2007)

At this point the participants already know in which areas they could become active if they would like to save the climate.

Now it is about what exactly you can do. If you want to reduce for example the effect of agriculture on the temperature-rising should you eat less? We will find out later. There are so many options to save the climate.

We walk to the train station or a bus stop, because the next topic is about mobility and we need some space for the first "game".

Transportation: How far can you get with half a Gramm of CO2?
The idea of this activity is to compare different ways of traveling and how far you can get if you use different ways of transportation and you are just allowed to use 0,5 Gramm CO2 per person in your vehicle.

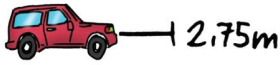
On the picture you can see how this activity works. Usually the Car-Team starts and shows the distance by unrolling the rope. As far as the rope goes two people can go by car until 0,5 g CO2 per person is emitted. Because usually you drive in twos, you can use one gram and this gram takes you 2,75 meter. This example is important, because nobody knows how far you can get with a gram of CO2 in a car.

After seeing how far you get in a car the participants can guess, how far they could go by using the train, the bus or the plane.

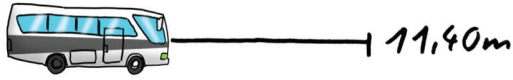
A discussion starts. If the bus is more environmentally friendly you can get farther than a car, but how far? If it is less environmentally friendly, the distance should be shorter than by a car.

The results:

Car (2 People in the car): 2,75 m/0,5g (105 kg CO_2 per person)



Long-Distance-Bus (80% capacity): 11,37 m/0,5g (23 kg CO_2 per person)



Train (70% capacity): 23,73 m/0,5g (11 kg CO_2 / Person)

Air-Plane (80% capacity): 1,91 m/0,5g (137 kg CO_2 / per person) / 0,63 m *

* Because airplanes also create steam (the visible condensation trails) at a height of 10 kilometres the impact on the climate becomes bigger. That way you could only get 63cm far with your 0,5 gram of CO2 in a plane.

The next topic is agriculture, food and its effect on the global warming.

Agriculture, food and Global Warming

The group walks for about 300 meters, heading to the nearest McDonald's (or another shop that is connected to food). While walking the participants have a break and a little time to chat.

After the arrival in front of McDonald's, six black foam cubes are laid down side by side on the asphalt together with six food dummies. The dummies are each representing a kilogram of bread, fruits, vegetables, beef, egg and milk. The task of the participants is now to assign the six foods to the six cubes. The size of each cube symbolizes the average amount of greenhouse gases caused by the production, processing, packaging and transportation of a particular food per kilogram. The plastic apple symbolizes fruits in general, the banana from Panama as well as the apple from your region.

The tour-guide could now assign the food to the dices in a short time and explain the reasons for it, but to make the learning process more sustainable, it is now up to the participants to become active. They need to discuss together which of the six chosen foods are more or less harmful to the climate. During the decision-making, the following questions can help:

Is the production of the food energy intensive?

Does the product need to be processed further?

Will the product be transported far?

Is packaging required?

Does the food require precursors?

To get the discussion going, the workshop leader can ask questions, for example, where the tomatoes, which you buy at the supermarket usually come from.

Gradually, the food is assigned to the cubes. The participants usually make changes to the order decided. It goes back and forth. The group usually never really agrees quickly.

Ask them in the end, why they think their distribution is correct. That way they need to express their thoughts and explain their decisions. Done!

Now everyone is looking forward to the right answer, even if the interest in the subject itself, climate change, is not so big. You want to know if you were right.

CO2 emissions of selected foods and cube size calculation

(All climate values have been converted into CO2, these apply to Germany and may differ in other countries.)

Foodstuff	CO_2-Emission (in gramme CO_2 pro kg Foodstuff)	Cube-Volume (1g CO_2e = 3cm^3)	Cube-Side-Length
Fresh vegetables	150	450 cm^3	7,7 cm
Fresh fruits	450	1 350 cm^3	11,1 cm
Bread	750	2 250 cm^3	13,1 cm
Milk	950	2 850 cm^3	14,2 cm
Eggs	1 950	5 850 cm^3	18,0 cm
Beef (from Cow)	13 300	39 900 cm^3	34,2 cm

Source: Pendos CO2 counter (Pendo Verlag 2007)

Nearly 30% of the anthropogenic climate change is created by agriculture and food, including parts of the destruction of forests (especially rainforests), because it is done for the cultivation of feed and food.

But it also becomes clear: if you want to protect the climate you do not have to starve. It depends on what you eat.

Basically,

• the less meat and other animal products such as milk, butter or eggs are consumed, the better it is for the climate.

• the less transportation, the better it is for the climate.

• the less processing or packaging the better it is for the climate.

Have a good appetite, the future eats with us!

Evaluation

The group leaves, hopefully they are going to discuss the tour during their next lesson in school. You can prepare some questions for the teacher, so it might motivate him or her to take up the topic during the next lesson.

Possible Questions:

What surprised you the most during the temperaTOUR?

Did you know most of the information before?

Did you talk with friends or your family about what you learned? And if so, how did they react?
Did the temperaTOUR motivate you to do something to protect the climate?
Is there something you would like to change now in your personal life?

More detailed instructions and Tips:
Please look at the website: <https://janun-hannover.de/climate-change-education.html>.

The website has material about the project and how to run it in English, German, Russian and Serbian.

About the Author

Achim Riemann founded his first environmental club in the age of eight. With 18 others he co-founded JANUN e.V. Since 1994 he has been working for the Youth Environmental Organization JANUN e.V. in the field of Education.