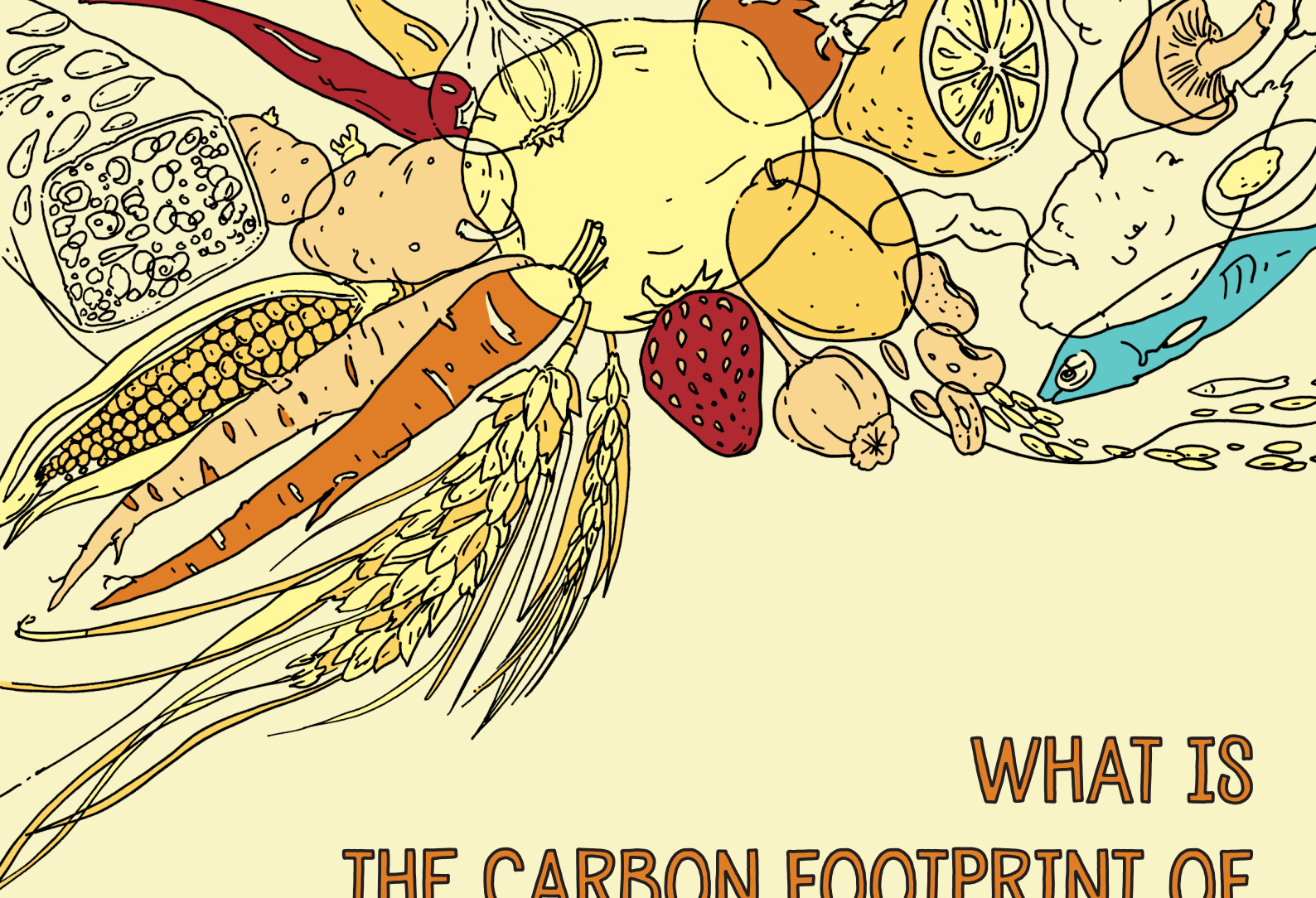
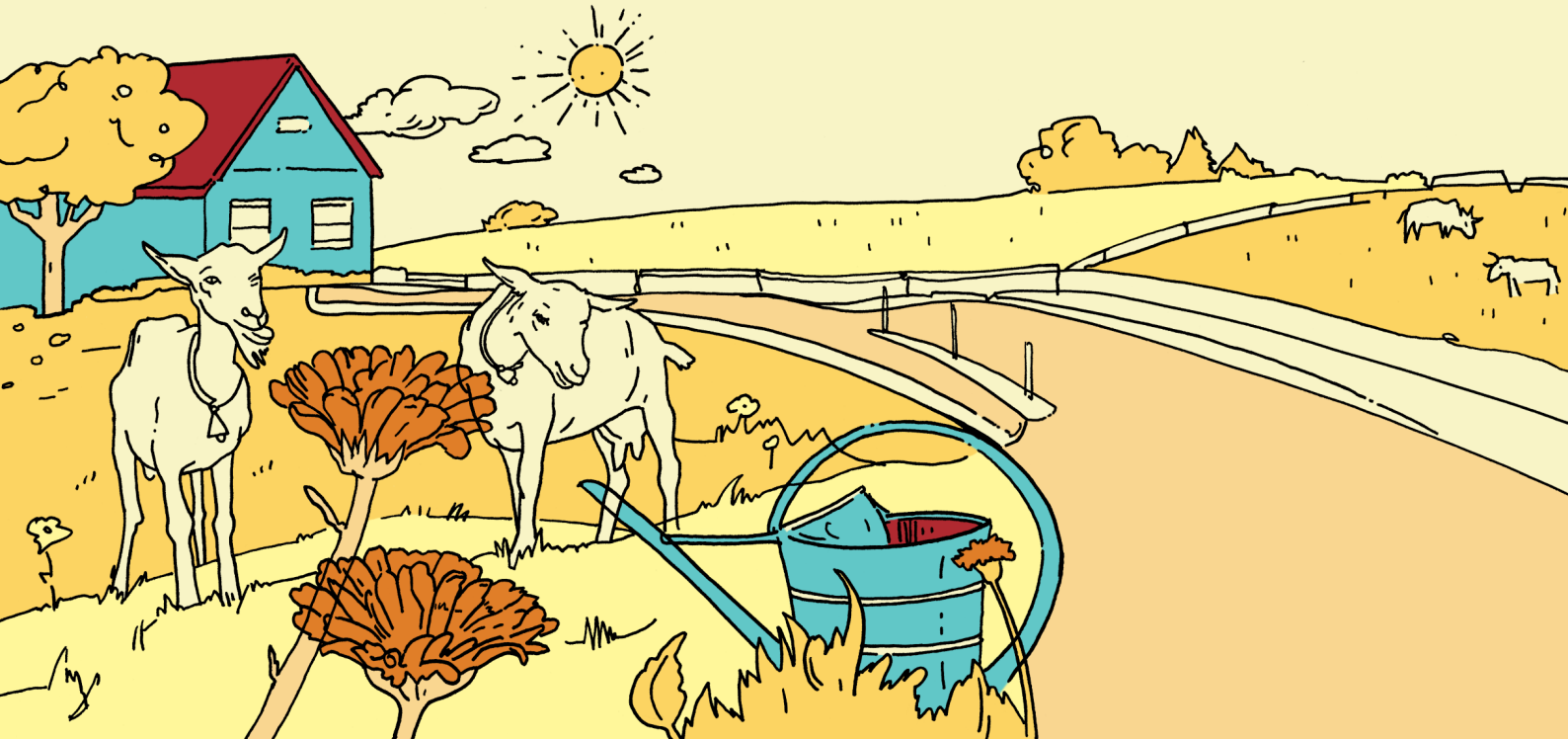


WHAT IS THE CARBON FOOTPRINT OF THE FOOD YOU EAT



INTRODUCTION

This indicator book was created as part of the Teaching Green project and should support teachers of students aged 10 – 16 years who are implementing education about climate change.

The educational process is divided into 4 steps. The first step is the creation of a group of students who will implement the project activities. In the introductory part, students fill out also an questionnaire about their attitudes link to the indicator mentioned below. The second step is theoretical preparation. You can use online learning models or your own resources. The third step consists of practical monitoring of the indicator (at least twice). The result of the monitoring is a presentation prepared by the students containing findings from the practical part. In the final fourth part, students fill out the attitudes questionnaire again and the changes in their character qualities are evaluated.

CLIMATE CHANGE IMPACT

Information about food-waste and the connection of food with climate change is crucial in understanding the environmental impact of our consumption habits. It involves not only the staggering amount of food that goes to waste but also the carbon footprint associated with production, transportation, and disposal of food. Calculation of the carbon footprint that is produced from consumed food and an explanation on why this is important to be considered when discussing climate action.

INDICATOR: The carbon/climate footprint of the food we eat.

Project activities support development of 6 essential character qualities:

- **mindfulness**
- **curiosity**
- **courage**
- **leadership**
- **resilience**
- **ethics**

You can find these icons next to the exercises.

Mindfulness
wisdom, self-awareness, observation, insight
"The awareness that emerges through paying attention on purpose, in the present moment, and non-judgmentally to the unfolding of experiences moment by moment."

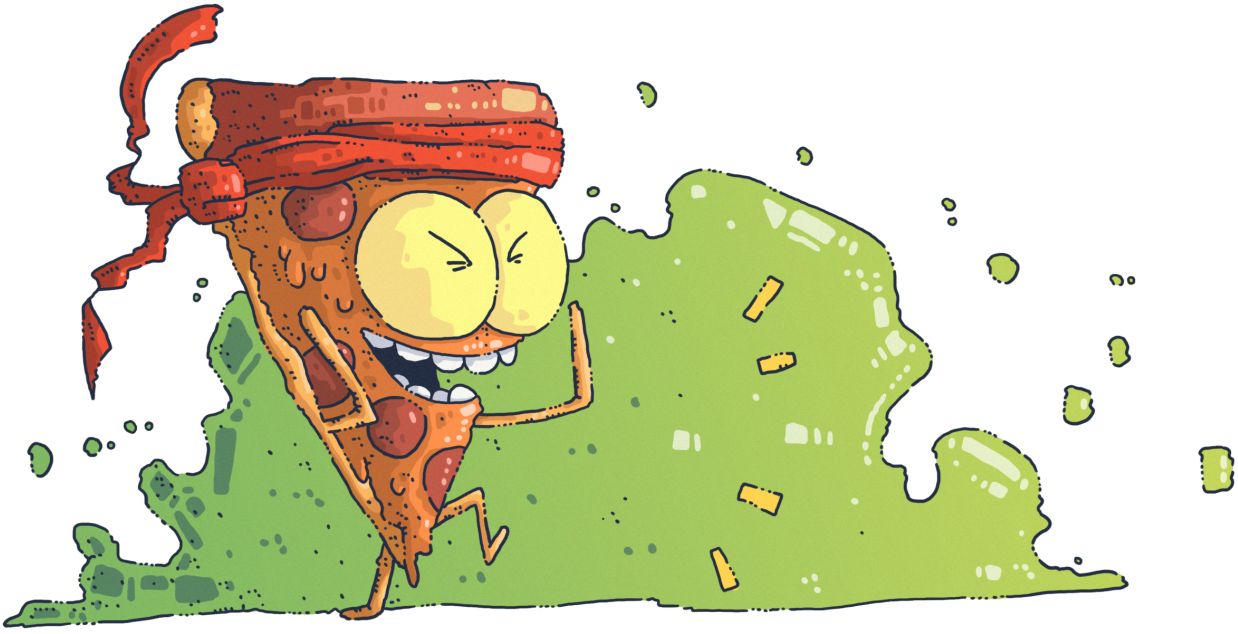
Curiosity
open-mindedness, exploration, passion, initiative, enthusiasm
"The essential desire for information, the drive to resolve uncertainty."

Courage
bravery, determination, confidence, risk taking
"The ability to act despite fear or uncertainty, in risky situations or when we are feeling vulnerable."

Leadership
responsibility, accountability, dependability, reliability, selflessness
"The relational and ethical process of people attempting to accomplish positive change."

Resilience
perseverance, grit, tenacity, resourcefulness, self-discipline
"The ability or set of qualities that allow one to overcome obstacles."

Ethics
benevolence, humaneness, integrity, respect, justice, fairness
"The moral principles that govern a person's behavior or the conducting of an activity."



THEORETICAL PART

Introduction to students

Food waste is the food that is fit for consumption but consciously discarded at the retail or consumption phases whereas **food loss** occurs before the food reaches the consumer as a result of issues in the production, storage, processing and distribution phases. The problem starts when decomposing food waste in landfills produces ***methane*** which is a strong greenhouse gas that contributes to global warming. Production, transportation and handling of food generates significant carbon dioxide (CO_2) emissions.

Food waste also relates to the date marking. Something that people usually confuse is the **'Best Before'** and **'Use By'** dates.
Let's see the difference:

- **'Best Before'** dates indicate the quality rather than safety. Thus, food is still safe to consume after that date on the condition that storage instructions are respected. However, it might begin to lose its texture and flavor.
- **'Use By'** dates indicate the period during which the product is safe to consume. Thus, products should not be used after that date. A study conducted by the European Commission (2018) estimates that up to 10% of food waste generated annually in the EU is linked to date marking. Consequently, the European Commission will propose the revision of EU rules on date marking aiming to prevent food waste linked to this matter.

Another important factor that is connected with food waste, is the **food shape**. Consumers usually prefer to buy 'perfect-shaped' foods (fruits, vegetables) which means often results in the imperfectly-shaped foods being disposed. An exploratory behavioural study on consumer choices indicated that consumers' willingness to buy imperfectly shaped foods increases as their price is reduced. Messages about authenticity, anti-food waste or awareness can affect consumers' choices and thus reduce food waste.
Different marketing nudges were introduced, causing a negative impact in the consumption of products including food. Some nudge marketing examples are the default option

for shipping, the smart notifications with social proof, the product labels with psychological triggers etc. All these nudges are imposed with the purpose to affect decision making of consumers.

Next time you visit at the supermarket, pay attention to these nudges. Some common examples, are:

i) the peeled and cut fruits and vegetables packed in plastic packaging including nudging messages such as 'ready to be consumed', 'easy and fresh' etc.,
ii) discounts only on select products,
iii) labels on products signifying that the product will be available for limited time only,
iv) products being located right before the cashier. All these visual and mental cues affect consumers' behavior and most of the times lead people to buy products that were not included in their shopping list.

Culture is also a factor that contributes to food waste. More specifically, the different traditional recipes of each country and the way people are used to cook plays a crucial role in the type of food people eat and the quantities that they cook. For instance, in Mediterranean countries a lot of the traditional dishes include meat (usually red) whereas 38% of the population in India are vegetarians.

So how does this connect to our discussion about food waste and climate change? Some foods have a higher carbon footprint than others. For instance, beef has the highest carbon footprint of any food because animals used for beef production require a huge amount of feed which must be grown on its own while also producing an extremely high amount of methane.

The Commission is committed to halving per capita food waste at retail and consumer levels by 2030 (Sustainable Development Goal 12, Target 12.3). Based on the food waste prevention strategies' pyramid (see Annex I) there are multiple steps that can be taken before the disposal of food waste. Starting with prevention actions, followed by reuse for human consumption, reuse for animal feed, recycling of material into high added-value products, recycling of nutrients, recovery of energy and ending up to the last and least preferable option which is the disposal of food waste.

? Questions for students

- **Have you ever wondered how the food we eat relates to climate change?**
- **Can you think of any actions taken to reduce food waste at school?**
- **Can you think of any actions taken to reduce food waste at home?**
- **How do you think culture relates to food and its waste?**
- **Have you ever wondered about the difference between 'best before' and 'use by' dates?**

RESOURCES FOR FURTHER STUDING:

- MODULE 1
- Resources related to food waste
- Carbon footprint measure

Earth Hero

Playstore iOS

- Food waste related reduction apps:

Too Good to Go

Playstore iOS

NoWaste

Playstore iOS

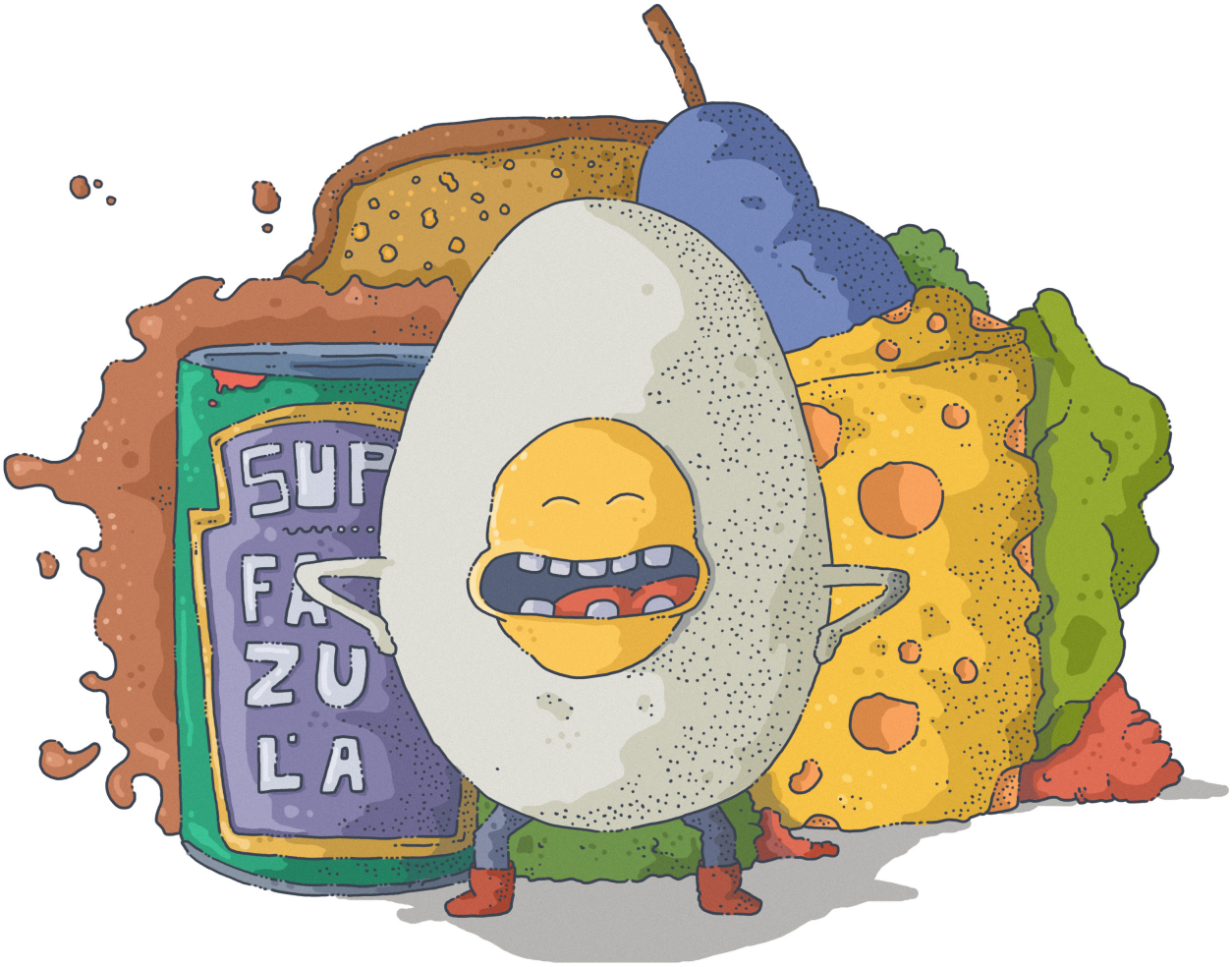
Mention only what is necessary to support their efforts to search for data, others will be available in the module for teachers.

- MODULE X
- Connection of culture:

Taste Atlas

NECESSARY TOOLS:

Mobile devices that are connected to the internet to download and use the applications



PRACTICAL PART

Aim of activity

The aim of this activity is to raise awareness on food waste that is produced from daily practices, identifying possible ways of collecting organic waste, and thinking of ways to reduce food waste.

Orientation or Engagement

After finishing the theoretical part, lead a discussion about the problem of food-waste (what it is, its impact, possible mitigation actions). Then, talk about spaces where organic waste will be collected (compost bin or designated areas in the school garden) and what kind of organic waste (fruits, vegetables, tea-bags, dry leaves etc.) can be collected for compost.

Ask students to observe and collect data (e.g. for a day or week) on how much organic waste is produced at their home. Students can also be asked to observe any marketing nudges they identify in their daily life and discuss them with their classmates.

Lastly, let them think of their favorite traditional dish, and ask them to make it more sustainable. Students can identify which foods are included in the dish they chose and what they find interesting about it.

The result of the discussion should be that students are curious about the food waste they produce, how this connects to climate change, and what actions they can take to reduce food waste.

? Questions for students

- **How do you feel about the food that is wasted on the school premises or at home?**
- **Do you notice any food waste prevention practices from people around you? How do you feel about them?**
- **Do you partake in any food waste prevention practices? If yes, what are they? If not, why?**
- **Do these practices affect you personally? Explain how.**

Conceptualization

Discussion on the topic should lead to understanding the difference between **food loss** and **food waste**, how it happens, why this is a problem for the environment, and how it connects to climate change.

Students are invited to focus on the practices happening at their school premises and home.

The result of the discussion should be the interest of students to find out how much food waste is created unnecessarily and how this food waste can be prevented or even used instead of being disposed.

Ask students to discuss in small groups and suggest possible solutions on how to reduce food waste and give ideas on how food waste can be used instead of being disposed. Each group then presents all the ideas to their classmates.

All the ideas are presented as a whole and a common conclusion on what needs to be done should be reached. Here, the teacher could connect the problem of food waste with food security and mention that children at their age in other countries are dying from hunger or have minimum access to food.

Investigation

Continue with the analysis of the current food waste situation.

- **What kind of organic waste is usually disposed?**
- **What is the volume of food waste that can be collected?**
- **How can this be interpreted in amounts of CO_2 and its link to climate change?**

Conclusion

Summarize the proposed solutions and ideas. Create a presentation with all the results and share it with other classmates or with the local community or school.

What actions can prevent this from happening?

Suggestions for possible solutions for food waste prevention and treatment:

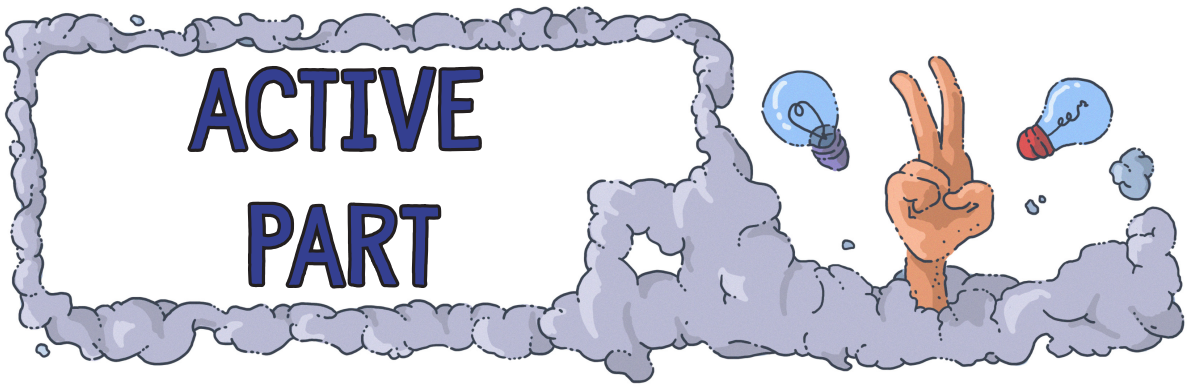
Tips when shopping at the supermarket, recipes from leftovers for the school housekeeping lesson or their home, usage of apps that can be implemented in everyday life to create and track new habits on reducing food waste, ideas on how to collect organic waste during cooking/after eating etc. Tips on how to correctly calculate the number of portions when cooking at home and thus decrease the risk of food waste.

Examples of best practices that can be applied:

- Pick imperfectly-shaped food
- Donate food
- Cook with leftovers
- Support local producers
- Try to cook with local food/ use seasonal products
- Discount on food that is about to expire soon
- Increase use of bio-products produced locally

How much food waste can be prevented if practices are followed?

What are the benefits of collecting organic waste and preparing your own compost?



Introduction of the school management with proposals for food-waste reduction practises (low-cost and high-cost) which will result in less CO_2, resources, and also money.

Track changes of habits related to food-waste (e.g. shopping practices at supermarket etc.).

Prepare some recipes from leftovers and share it with classmates.

Come up with an educational purpose for the created solution – a Padlet, a short video (maybe through TikTok), an interactive presentation (maybe using Prezi) etc.

RESOURCES

https://food.ec.europa.eu/safety_en
https://www.hsph.harvard.edu/nutritionsource/sustainability/food-waste/
https://www.usda.gov/media/blog/2022/01/24/food-waste-and-its-links-greenhouse-gases-and-climate-change#:~:text=Food%20loss%20and%20waste%20also,even%20more%20potent%20greenhouse%20gas.
https://www.greeneatz.com/foods-carbon-footprint.html
https://food.ec.europa.eu/system/files/2021-04/fw_lib_stud-rep-pol_ec-know-cen_bioeconomy_2021.pdf
https://eeb.org/eu-wastes-more-food-than-it-imports-says-new-report/#:~:text=Food%20waste%20costs%20EU%20businesses,of%20agricultural%20land%20%5B6%5D.

WHAT IS THE CARBON FOOTPRINT OF THE FOOD YOU EAT

Text: Markella Papanicolaou
Ilustrations: Tomáš Cíger, Katka Slaninková
Graphic Design: Andrea Plulíková
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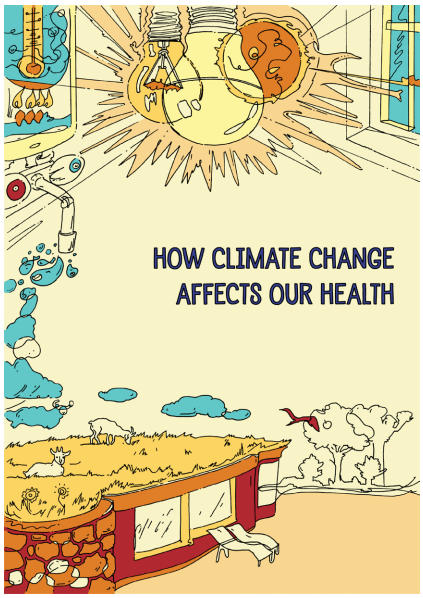
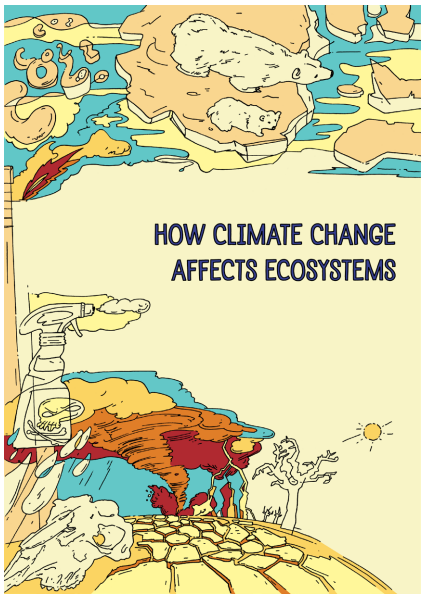
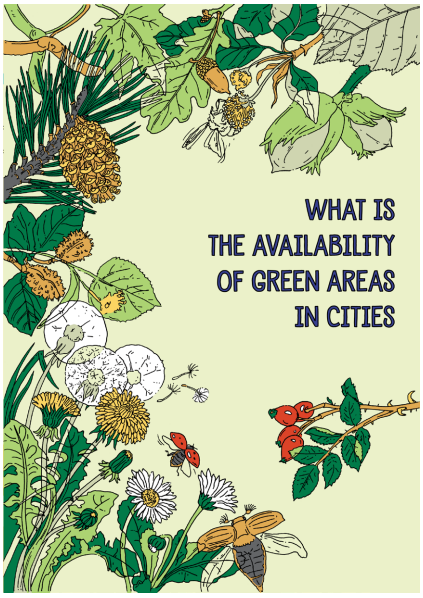
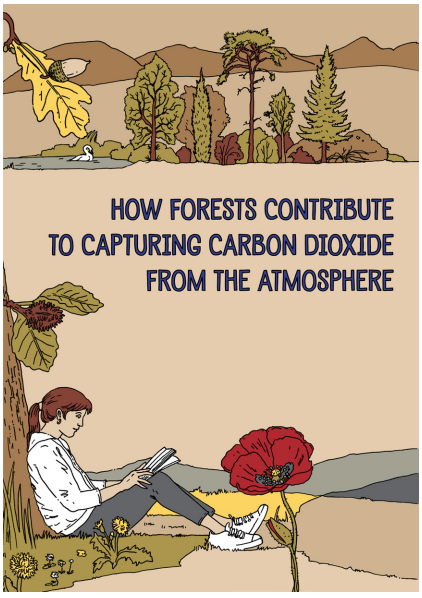
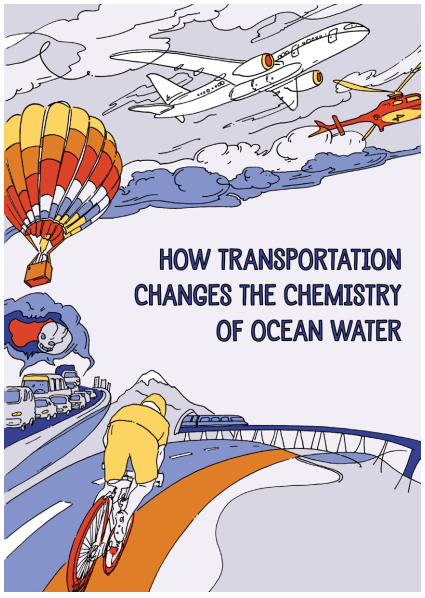
OTHER INDICATOR´S BOOKS YOU MAY LIKE CAN BE FOUND ON: TEACHINGGREEN.EU

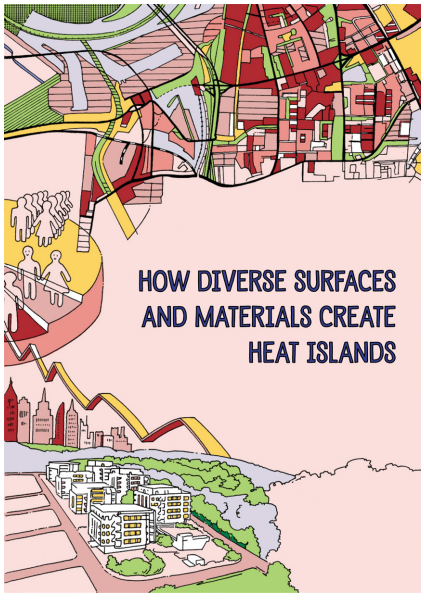


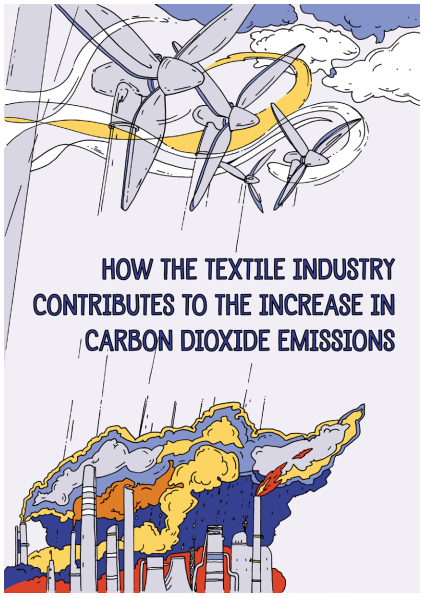


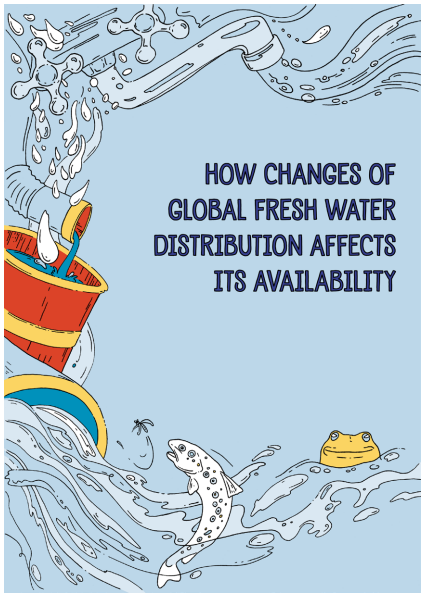












STROM ŽIVOTA

UNIVERZITA KONŠTANTÍNA FILOZOFA V NITRE

CARDET

Vita21 eco-consulting

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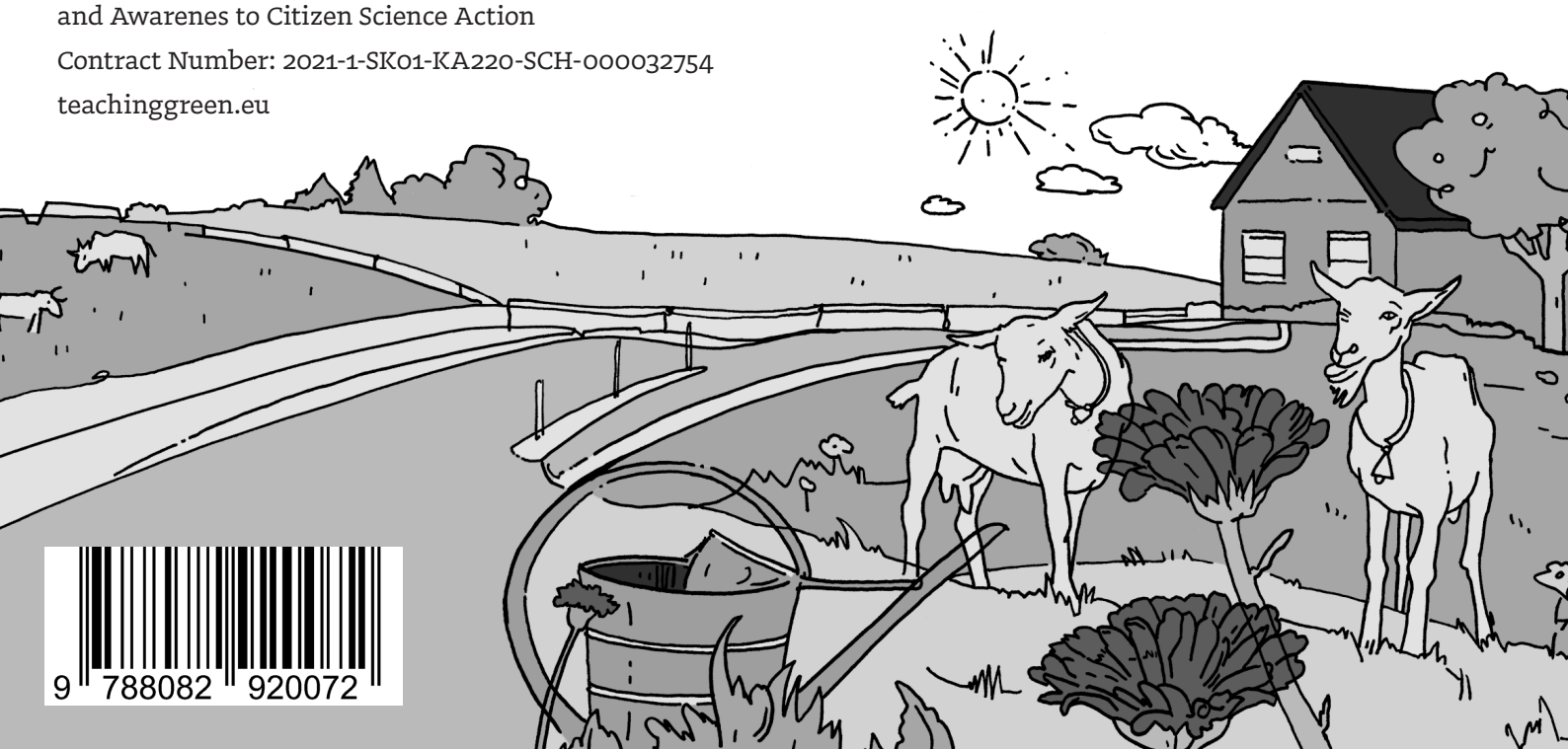

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