

Climate Education

# EduQuest Yourself!

# Content

0.0

0.1	Preface	3	Attachments	47
1.	Simple games introduction	4		
1.1	Outdoor games	5	1.1 Attachment	49
1.2	Question-Answers	6	1.2 Attachment	56
1.3	Quiz	8	1.3 Attachment	90
1.4	Situation games	9	1.4 Attachment	105
1.5	Ecomatic	10	1.5 Attachment	111
2.	Complex programs introduction	11	2. Attachment	
2.1	Carbon snake	12	2.1 Attachment	121
2.2	Dinner from 0 km	14	2.2 Attachment	125
2.3	Ecological footprint	16	2.3 Attachment	126
2.4	Fair trade products	19	2.4 Attachment	135
2.5	Household appliances in the past	22	2.5 Attachment	138
2.6	Renaissance of season	23	2.6 Attachment	139
2.7	Slow kitchen, slow city	25		
2.8	Biomimicry summary	28		
2.9	Sustainability audit	29		
2.10	Exhibition_ Electronical devices	34	2.10 Attachment	141
2.11	Dig deep contest	35	2.11 Attachment	150

**„He who learns but does not think, is lost!  
He who thinks but does not learn is in great danger.”**

said Confucius many years ago. Unfortunately, his thoughts are still valid today. Even more now, when the impact of our decisions knows no borders, the world and its problems have become global.

If we look at the state of the world, it may seem that after 2.5 thousand years we know much more, but our capacity for thinking, and therefore our wisdom, is still not equal to our knowledge. We are making decisions at the individual, economic, and political level that may increase material wealth in some parts of the world in the short term, but we can only achieve this by over-exploiting nature, by eating the future.

We need more wisdom to see through the artificial advertising world and realize consumerism's real consequences. To do this, we must put aside our thinking that we must adapt to the world, be good consumers, and yearn for the paradise that advertising offers us. In addition to imparting knowledge, this is the aim of this collection: to encourage young people to think in a light, playful way, in the hope that they will see the connections and be able to separate the essential from the inessential.

For as George Orwell wrote in his book called 1984:

**„To think, to think, even with a split second left  
- to think was the only hope.”**

Would you like to spice up the session with a short, inspiring, playful, but still useful and educational task?

You want to show the participants that even serious topics have an interesting or funny side?

## ***Choose one of the games below!***

In this section, we have collected simple and shorter games that the teacher, facilitator or group leader can use as a supplement to the related environmental or nature conservation topic during classes, camps, workshops or various trainings.

Quizzes, question-and-answers, ecomata and various other longer or shorter nature-related exercises (getting to know each other, sensory games, ice breakers) belong to this group. Before the description of the games, there are also suggestions for implementation.



### CLIMATE CHANGE AREA (basis of the sequence of activities)

- biodiversity
- ecosystem



### AGE

- 12-18



### TYPE OF USAGE

- informal education
- formal education



### DURATION

- Preparation: 1 hour
- Activity: 10-20 min



### PLACE OF EXERCISE

- outdoor

## Summary

We are living in an ever changing and fast world where we are constantly struggling with how to manage our time. These outdoor games are a great opportunity to slow down and raise the interest as well as awareness of the participants to their surroundings and the beauties of nature. The games can also help to get attuned to environment related topics or warm up the participants for a longer workshop, program or lesson.

### KEYWORDS

experience based learning; observing nature; animal imitation;

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

The participants

- discover the details of their environment and understand the smaller ecosystems surrounding us.
- come to know the mining industry's impact on nature and our health.

### METHODS

- game
- teamwork

### TOOLS AND MATERIALS

- See the list below by game.



# A game of questions and answers



### CLIMATE CHANGE AREA (basis of the sequence of activities)

- biodiversity
- energy conservation
- expressions related to climate change



### AGE (DIVIDED BY TOPICS)

- expressions related to climate change: 14+
- indigenous and invasive species: 12-14
- energy conservation: 14+



### TYPE OF USAGE

- informal education



### DURATION

- Preparation: 10 min
- Activity: 30 min



### PLACE OF EXERCISE

- indoor
- outdoor

## Summary

This game covers 51 concepts and terms related to environment protection and nature conservation. It provides knowledge in a playful way for different age groups and helps to deepen their understanding of and attunement to each topic. It is recommended as a warm-up exercise for workshops, activities or lessons.

### KEYWORDS

indigenous species, invasive species, energy conservation, sustainability, green-houses gasses, emission

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Participants will discover new facts regarding the expressions related to climate change, the topic of energy conservation, and indigenous and invasive species.
- Through these new facts, they will learn about the environmental problems caused by global climate change and the human impact on the environment.

### METHODS

- teamwork
- brainstorming

### TOOLS AND MATERIALS

- cards
- paper
- item (ball or a plush toy)
- pen or pencil

### PREPARATIONS

Print the cards double-sided and if possible laminate them so you can use them later again. Mix the cards and place them next to yourself. Prepare the paper with the pen or pencil that you will use to track the groups' points.

### ARRANGING THE PLACE

We need a large space with enough chairs for everyone. If we play outside the groups can sit on the ground.

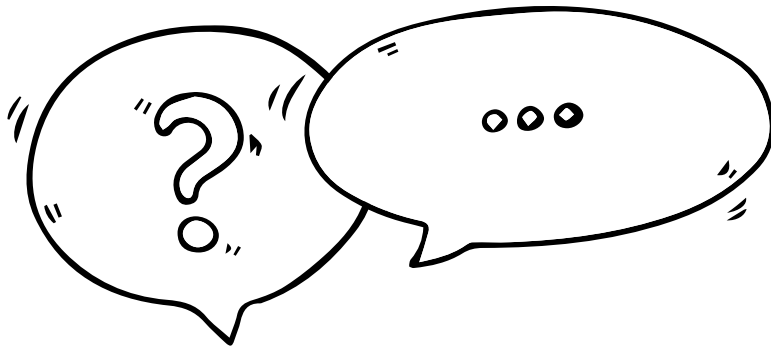
### DESCRIPTION

Divide the participants into 2 groups. The groups must choose a name. Each team will have 1 minute to guess as many words as they can. The facilitator will start to read aloud the statements without saying the word on the top of the card. As soon as the group realizes the answer they can say it so the facilitator can draw the next card and read the statements again. The team with the most points wins.

# A game of questions and answers

## EXTENSIONS/ VARIATIONS

This version should be played outdoors. Divide the participants into groups of 4-5. Create a circle with the groups around the facilitator. Place an item next to the facilitator that can be picked up. If the groups know the answer one of the members needs to run and pick up the item in the middle. The group that picks up the item first can tell the answer aloud. If it's incorrect the chance is given to the group whose member arrived second to pick up the item. The team with the most points wins.



# Simple Games

## Quizzes

# 1.3



### CLIMATE CHANGE AREA (basis of the sequence of activities)

- biodiversity conservation
- mitigation and adaptation
- conscious consumption



### AGE (DIVIDED BY TOPICS)

- conscious shopping: 12+
- sustainability: 14+
- climate change: 14+



### TYPE OF USAGE

- informal education



### DURATION

- Preparation: 5 min
- Activity: 10 min



### PLACE OF EXERCISE

- indoor
- outdoor

## Summary

The quizzes are intended to be an icebreaker to set off a workshop or a lesson. The topics draw the attention of the participants to global problems and raise their awareness of what they can do for the future of our planet.

### KEYWORDS

consumption; emission; fair trade; water pollution; plastic pollution

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Participants will discover surprising facts about sustainability, the reasons

for climate change, and conscious consumption.

- Participants will be aware of the steps they can take to reduce their ecological footprint.

### METHODS

- game
- teamwork

### TOOLS AND MATERIALS

- The attachment is printed onto an A4 sheet or displayed with a projector.

### PREPARATIONS

Read through the quiz and the correct answers. Print out the quiz you would like to use or prepare with a projector to display the question and possible answers. If you choose to print, laminate the sheets so they can be used later.

### ARRANGING THE PLACE

Arrange the tables to be suited for a small group of 3-4 people or move the chairs to create an open-end circle.

### DESCRIPTION

Form small groups. Give a quiz to each group. The participants will have 10 minutes to fill out the quiz. Present the correct answer to the participants.

This game can be played individually as well. If you want to move the participants, mark three points on the spot. These points will indicate the A, B, or C answers. Read aloud the question and possible answers. If you are indoors display the quiz on the wall with a projector. Ask the participants to move to one of the points according to their ideas of the correct answer.




**CLIMATE CHANGE AREA (basis of the sequence of activities)**

- conscious consumption
- biodiversity conservation
- exploitation


**AGE (DIVIDED BY TOPICS)**

- conscious shopping: 12+
- electronic devices: 14+
- meat consumption: 12+
- waste and paper: 12+


**TYPE OF USAGE**

- informal education


**DURATION**

- Preparation: 5 min
- Activity: 20 min


**PLACE OF EXERCISE**

- indoor
- outdoor

## Summary

To better understand climate change we need to be more empathic toward each other. What happens when we place ourselves in a situation where we have to face the challenges climate change poses to us? Can we convince someone to do better when faced with irrefutable facts?

**KEYWORDS**

conscious consumption; deforestation; exploitation of land and people; animal rights

**PREREQUISITE KNOWLEDGE IS**

- needed
- not needed

**LEARNING OBJECTIVES**

- Participants will discover the complexity behind waste and paper use, the exploitation connected to electronic devices, the idea of a conscious consumer, and the importance of a balanced, sustainable diet.
- Participants will have a chance to strengthen their debating skills.

**METHODS (CHOOSING ONE FROM THE LIST)**

- role play
- discussion
- research
- teamwork

**TOOLS AND MATERIALS**

The attachment is printed onto an A4 sheet or displayed with a projector.

**PREPARATIONS**

Read through the situations. Print out the situations you would like to use or prepare with a projector to display the task. If you choose to print, laminate the sheets so they can be used later.

**ARRANGING PLACE**

Arrange the tables to be suited for small groups of 4-6 people.

**DESCRIPTION**

Form the small groups of 4-6 small people. Give a situation to each group. The participants will have 20 minutes to prepare for the play and then 5 minutes to present. Background information is attached to each situation, but participants can also do their own research. Before presenting participants should organize the main points of their argument and define the roles each of them will play during the presentation. After presenting, ask the participants to share the two most surprising facts they learned from their research during the game.

**CLIMATE CHANGE AREA (basis of the sequence of activities)**

- biodiversity
- recycling
- energy conservation
- climate change

**AGE (DIVIDED BY TOPICS)**

- biodiversity & recycling: 12+
- energy conservation & climate change: 14+

**TYPE OF USAGE**

- informal education

**DURATION**

- Preparation: 1 day
- Activity: 30 min

**PLACE OF EXERCISE**

- indoor
- outdoor

## Summary

The Ecomatic is a 1.70-1.80 m high folded cardboard box (optionally painted with drawings on the outside) with a question window in front and answer slots (A, B, C - three possible answers). There is a volunteer inside the box whose role is to continuously change the questions (folded A4 papers) in the window and monitor the choices. The person who submits the answers put his/her hand in the small windows (A, B, or C) and receives a surprise gift (walnut, sweets, fruit) in case of a good answer or a little stone in case of a wrong answer.

**KEYWORDS**

ecological footprint, CO<sub>2</sub> emission, plastic & paper & hazardous waste, composting, sustainability, greenhouses gases

**REREQUISITE KNOWLEDGE IS**

- needed
- not needed

**LEARNING OBJECTIVES**

- Participants will discover new facts regarding energy conservation, recycling, and climate change.
- The game draws attention to our everyday consumption. The participants will learn about the effects of climate change and get to know tips on how to live a more sustainable life.

**METHODS**

- DIY activities
- current events quizzes

**TOOLS AND MATERIALS**

- cardboard box
- questions
- surprise gifts (nuts, fruits, sweets, etc.)
- 1 or 2 volunteer

**PREPARATIONS**

Prepare the cardboard box ahead of the event. This can be made by the facilitator or it can be a group task as well. In the following section, you can find a step-by-step explanation of the box. Prepare each question separately so it can be put in the question window. You can find the premade questions with the correct answers highlighted in the attachment.

Tools and materials to make the box:

- 4 sheets of cardboard, size: 170 cm x 60/ 70 cm (the cardboard should be at least 3 layered)
- self-reinforced PP adhesive tape, at least 15 cm
- 3 bands of burlap, at least 15 cm wide, 170 cm high
- brushes for painting
- bookbinding glue
- durable punched packet (sheet protector) for transparent window, it must be one with top and side opening
- scissors
- box cutter

# Complex Programs

When participants need to examine or explore a previously unfamiliar topic, complex programs are recommended. In such situations, we approach the topic from multiple angles to highlight its complexity.

These diverse methods assist participants in gaining familiarity with the subject through hands-on experiences, potentially teaching others and absorbing new information. This approach enables them to develop lasting insights and knowledge through personal experience.

In addition to the conventional knowledge transmission methods, various exercises, games, and activities like competitions and exhibitions enhance the exploration of environmental and nature conservation topics. This approach fosters the development of a systemic perspective, which is essential for an authentic representation of nature conservation.

# Complex programs

## Carbon Snake

# 2.1



### CLIMATE CHANGE AREA (basis of the sequence of activities)

- reasons for climate change



### AGE

- 12-15



### TYPE OF USAGE

- informal education



### DURATION

- Preparation: 20 min
- Activity: 30 min



### PLACE OF EXERCISE

- indoor setting

## Summary

Numerous factors, ranging in severity, contribute to CO<sub>2</sub> emissions, including our modes of transportation and the food we consume. In this activity, we will explore these aspects through 24 different examples.

### KEYWORDS

Carbon footprint; CO<sub>2</sub> emission; transportation; food;

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

Participants will gain awareness of the varying CO<sub>2</sub> emissions associated with different goods and modes of travel.

### METHODS

- brainstorming
- discussion
- game
- synthesis
- teamwork

### TOOLS AND MATERIALS

- (laminated) colored pictures (attachment)
- string
- tweezers

### PREPARATIONS

Print a colored copy of the „Carbon Snake” images and laminate them for durability.

### ARRANGING PLACE

Arrange the tables to accommodate three groups.

### DESCRIPTION

The carbon footprint serves as a measure of the environmental impact caused by human activities. It quantifies the direct and indirect emissions of greenhouse gases resulting from various sources, such as an individual's lifestyle, product life cycles, or a company's operations. These emissions are expressed in carbon dioxide equivalents (CO<sub>2</sub>e), encompassing all greenhouse gases, including methane, nitrous oxide, fluorinated gases, and others. The larger the carbon footprint associated with an activity, individual, community, or society, the greater its contribution to climate warming.

In the present day, there is a unanimous recognition of the urgent need to combat climate change by reducing greenhouse gas emissions. To make a meaningful difference, we must acknowledge our own environmental impact and take steps to minimize our carbon emissions.

Our carbon footprint is influenced by numerous factors, including residential energy consumption, transportation fuel usage (private cars, public transport, air and maritime travel), the quantity and lifespan of household appliances, internet usage, banking services, leisure activities (sports, culture, entertainment, vacations), waste generation, and notably, our dietary choices and associated waste.

Carbon calculators offer numerous ideas for reducing emissions through simple adjustments to our daily habits. While many of these small changes may go unnoticed individually, the cumulative impact can be significant if embraced collectively. It is crucial to emphasize that the transformation required extends beyond individual actions and must also involve communities and decision-making processes.

### **CARBON FOOTPRINT DEFINITION**

How large is your carbon footprint? Divide the participants into three groups. Start by having each group sort the small cards into three main categories: mobility, food, and goods. Then distribute the cards within each group based on the corresponding category. Their task is to arrange the small images in order of their carbon footprint size, beginning with the lowest CO<sub>2</sub> emitter and progressing to the highest.

Next, stretch a string across the room (or ask two participants to hold the ends). Divide the string into three sections, assigning one section to each group. Instruct them to use tweezers to attach the pictures onto the string according to the CO<sub>2</sub> emissions associated with each card.

Finally, facilitate a discussion about the order of the different picture types. What choices should we make if our goal is to reduce our carbon footprint?

### **SOLUTION:**

Foods – 03, 02, 05, 07, 01, 06, 08, 04

Goods – 13, 11, 14, 16, 15, 12, 09, 10

Travel – 23, 24, 18, 17, 22, 21, 20, 19

### **EXTENSIONS/VARIATIONS**

You can focus on a single main topic and prepare the cards accordingly. Cut the cards into smaller pieces and distribute them among the three groups. Each group can then arrange their cards accordingly. Once they have finished arranging the pictures, bring the groups together and have participants attach the images to the string based on their CO<sub>2</sub> emissions. Encourage them to discuss their decisions and the reasoning behind them.

### **RESOURCES**

Activities of Magosfa Foundation

### **ATTACHMENTS (WORKSHEETS, PICTURES, ETC.)**

Three worksheets with images.



# Complex programs

## Dinner from 0 km

## 2.2



### CLIMATE CHANGE AREA

- possibilities of prevention



### AGE

- 12-15



### TYPE OF USAGE

- informal education



### DURATION

- Preparation: 15 min
- Activity: 30-45 min



### PLACE OF EXERCISE

- indoor setting

## Summary

Consuming local products, heirloom vegetables, fruits and seasonal produce has numerous benefits for our well-being and the environment. Introducing the concept of food sovereignty is a key objective of this activity.

### KEYWORDS

seasonal products; food sovereignty; fitting cultivars to the landscape; transportation cost; air pollution

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Raising awareness of the economic, environmental and social costs;
- Highlighting the benefits of heirloom vegetables and fruits; seasonal and local products;
- Raising awareness of our surroundings.

### METHODS

- analysis
- brainstorming
- planning
- teamwork

### TOOLS AND MATERIALS

- paper
- paper with baskets drawn on it
- pens or pencils

### PREPARATIONS

The facilitator should consider the plants, animals, and food ingredients that participants may mention. It is helpful to have some well-known recipes prepared. Participants can create their own baskets before the activity.

### ARRANGING THE PLACE WHERE FOOD WILL BE PREPARED

This step is only relevant if food can be prepared on-site. Use the kitchen of the hosting place, a school kitchen, or a campsite for this purpose.

### DESCRIPTION

The concept of food sovereignty emerged in the 1990s in the context of civil protests against the World Trade Organization (WTO) negotiations on agriculture. It aims to ensure that local communities are not reliant on distant lands for their food supply. Instead, they can produce their own food using sustainable, environmentally friendly methods and receive fair compensation for their work. The natural resources of a country enable us to cultivate safe and high-quality crops without jeopardizing future generations or depleting natural wealth. By implementing proper production, manufacturing, transportation, storage, and food preparation practices, we can prevent the consumption of harmful substances.

Only foods that have been proven to be safe should be available in the market. Conscious consumers seek out healthy, low-impact food options and carefully scrutinize product ingredients, origins, and cultivation conditions. They choose products from local farmers, recognizing that their choices can impact the local economy, supporting local jobs, and keeping money circulating within the community.

## Complex programs

# Dinner from 0 km

## 2.2

Purchasing organic products supports a production process free from pesticides, resulting in food with higher nutritional value while protecting the environment. Consumers who buy organic products are endorsing a production system that is local, organic, and not reliant on imported or chemical-based methods. Even consuming non-organic heirloom plants reduces the risk of pesticide exposure by a significant margin. This is because plants grown in their natural habitats, where the climate and soil conditions are ideal, require fewer chemicals for cultivation.

By buying and consuming locally grown food, individuals reduce their environmental impact by not supporting large-scale industrial plant production and the associated transportation emissions. It is advisable to avoid ultra-processed food, which often contains artificial colors, flavors, and preservatives.

Carbon calculators offer numerous ideas for reducing emissions through simple adjustments to our daily habits. While many of these small changes may go unnoticed individually, the cumulative impact can be significant if embraced collectively. It is crucial to emphasize that the transformation required extends beyond individual actions and must also involve communities and decision-making processes.

### TASK

#### 1. WHAT CAN BE PLANTED AND GROWN HERE?

If the participants grow up in a smaller settlement and are familiar with farming, the game might be easier for them. Everyone says a plant or an animal from the area, but it doesn't have to be edible. If they can't say any, they can say "pass" and think until the next round. The facilitator writes the list on wrapping paper or a board. Once you have a good collection of plants and animals on the list, you can stop. We talk about the benefits of the listed organisms. Observe the biological diversity of the list and identify which plants and animals are edible, which require cultivation, and which can be gathered. This exercise demonstrates that we live in a place where we can survive thanks to the abundance of plants and animals surrounding us. Even if we were unable to leave the area, we would have enough to sustain ourselves. The facilitator should raise awareness of how commercial food production and global trans-

portation overshadow local production possibilities and their impact on our food consumption.

#### 2. WHAT SHOULD WE EAT FOR DINNER?

Examine the items on the list together. Which ones are delicious and well-liked by participants? Volunteers can suggest dinner ideas based on the listed products. The facilitator should inquire if all the ingredients, including herbs, can be obtained locally. Decide on the menu collectively.

#### 3. GATHER THE INGREDIENTS

If you have participants who are gardening at home or growing herbs on the balcony, print them a basket. They should write or draw the products they will contribute to the dinner. Everyone places their baskets on the table.

#### 4. EVALUATION, FEEDBACK

Evaluate whether all the ingredients necessary for the planned meal can be obtained locally. Identify any ingredients that are not available locally, such as rice or cooking oil, and discuss the distance traveled to obtain them and how it impacts the „zero-kilometer dinner” concept.

#### EXTENSIONS/VARIATIONS

If the workshop location permits, prepare the dinner together using local ingredients. Discuss the first two points a day before and then prepare the dinner on the following day based on the third and fourth points. Be mindful of any potential allergies before preparing the food.

#### RESOURCES

Vásárhelyi, J.: Nulla kilométeres vacsora in Neumayer, É., Zentai K. et al (2020): Fogyasztó kúra, p. 141-145. Magosfa Alapítvány, Vác

# Complex programs

# Ecological footprint

## 2.3



### CLIMATE CHANGE AREA

- overall presentation
- reasons for climate change



### AGE

- 12-15



### TYPE OF USAGE

- formal education
- informal education



### DURATION

- Preparation: 20 min
- Activity: 30-45 min



### PLACE OF EXERCISE

- indoor setting

## Summary

Humanity's current way of life is not sustainable in the long term. The residents of developed countries are consuming an excessive amount of natural resources, more than their fair share, to fulfill their immediate needs, disregarding the well-being of citizens in other countries and future generations. These facts are introduced to the participants through the concept of the ecological footprint.

### KEYWORDS

ecological footprint; natural resources; living standards; population; justice

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Introducing the concept of the ecological footprint.
- Recognizing the natural resources, we use to satisfy our everyday needs
- Recognizing by distributing the Earth's resources equitably, we can halt overconsumption.
- Reflecting on the concept of justice.

### METHODS

- discussion
- hands-on activity
- measurement and estimation
- teamwork

### TOOLS AND MATERIALS

- country cards cut out from the attachments
- approx. 3 sheets of A4 cardboard/slides (paper can also be used)
- scissors
- glue or stapler
- pencil
- ruler or tape measure
- thick marker
- blu tack
- Optional: World map with countries displayed on a blackboard or projected (alternatively, draw one on wrapping paper)

### PREPARATIONS

Cut out the country cards from the attachments. Prepare the necessary tools for the activity. Optionally, create the standard footprint (the „etalon“) measuring 1.8 gha (25 cm long, 8 cm wide) prior to the activity.

### ARRANGING THE PLACE

Arrange the participants in a circle, leaving enough open space in the middle for everyone to stand comfortably.



# Ecological footprint

## DESCRIPTION

Begin by explaining the concept of the ecological footprint to the participants.

In order to meet human needs, we must rely on natural resources. The planet provides essential resources such as water, land, vegetation, sunlight, and air, which are crucial for sustaining life on Earth. It is imperative to protect and preserve these renewable resources to maintain ecosystem stability. However, we must also recognize that these natural resources are not infinite due to the size of our planet. As we disrupt the systems that renew these resources, the Earth's carrying capacity significantly diminishes.

Improving the efficiency of resource utilization and ceasing exploitation can potentially increase Earth's carrying capacity, but it remains finite. Unfortunately, these utilization practices often compromise regeneration systems, resulting in an overall decrease rather than an increase in carrying capacity. For instance, intensive irrigated agriculture may lead to soil salinization, depletion, increased erosion, pollution of surface and groundwater, and the displacement of valuable semi-natural ecosystems. While such practices may temporarily increase yields for a few years or decades, they inevitably lead to a sharp decline for centuries thereafter.

To assess the extent of our consumption compared to the land's productivity, the concept of ecological footprint has been developed. This concept allows us to compare different natural resources by quantifying the amount of land required for their production. The ecological footprint reveals the land area necessary to sustain the consumption of goods without causing long-term harm to the production areas and neutralize our emissions (including waste, carbon dioxide, pesticides, wastewater, etc.). It's important to note that pollution of water, air, and soil is also considered a form of resource consumption. Since the productivity of one hectare of land can vary significantly depending on geographical location and cultivation type, an adjustment factor is applied to determine average values. Hence, the ecological footprint is measured in global hectares (gha). An individual's ecological footprint depends on their lifestyle, the amount of goods they possess and consume, as well as the efficiency with which these goods were produced and the resources utilized in the process.

The ecological footprint (EF) per capita (per person):

$$EF_{Per\ capita} = consumption \times efficiency \ [gha / person]$$

The ecological footprint depends on the number of people considered.

The ecological footprint of humanity is:

$$EF_{Humanity} = EF_{Per\ capita} \times population \ [gha]$$

$$EF_{Humanity} = population \times consumption \times efficiency \ [gha]$$

The ecological footprint of countries can be calculated in the same way.

$$EF_{Per\ capita} = consumption \times efficiency \ [gha / person]$$

The ecological footprint, naturally, varies depending on the number of people considered.

Therefore, the ecological footprint of humanity can be expressed as follows:

$$EF_{Humanity} = EF_{Per\ capita} \times population \ [gha]$$

$$EF_{Humanity} = population \times consumption \times efficiency \ [gha]$$

The ecological footprint of individual countries can be calculated in a similar manner.

Biocapacity reveals the ecosystem's ability to generate renewable resources and assimilate the waste produced by humans. When the ecological footprint surpasses the biocapacity, an area experiences a deficit because the ecosystem cannot regenerate quickly enough to meet the demands. Earth's resources serve as a shared foundation for humanity, and if we overconsume, we deplete the resources that future generations rely upon. The Global Footprint Network (GFN) tracks changes in the ecological footprint and biocapacity of each country over time. By examining the charts, we can draw conclusions about the economic, social, and environmental changes occurring in different countries.

## TASK

Each participant will receive a country card (see attachments) and assume the role of a citizen from that country. The cards should not be revealed to one another. The objective is to create a footprint that is proportional to the ecological

## Complex programs

# Ecological footprint

## 2.3

footprint of the average citizen of their assigned nationality, as indicated on their respective cards. Highlight the data on the card that represents the „shoe size.”

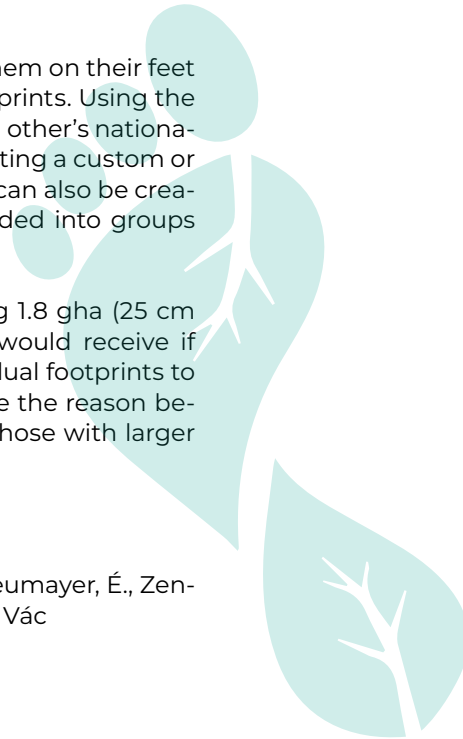
To create the footprint, participants only need to make a slipper for one foot. They should draw and cut out the footprint according to the numbers on their cards. Then, they can make a strap and attach it to the footprint using glue or staples. If time permits, they can also decorate their slippers.

Once everyone has completed their slippers, they should put them on their feet and walk around or form a circle based on the size of their footprints. Using the size of the footprints as a clue, participants can try to guess each other's nationalities. After some guessing, they can assist one another by imitating a custom or habit from the given country. Flags representing the countries can also be created to aid in identifying nationalities. Participants can be divided into groups based on continents.

On the ground, create or draw a standard footprint measuring 1.8 gha (25 cm long, 8 cm wide). This represents the amount each person would receive if Earth's resources were distributed equally. Compare the individual footprints to this standard one. Whose footprint is larger, and what could be the reason behind it? What are the items or resources consumed more by those with larger footprints compared to those with smaller footprints?

### RESOURCES

Tomcsányi, Zs.: Ökolábnyom, avagy mennyi jut a tortából. In Neumayer, É., Zentai K. et al (2020): Fogyasztó kúra, p. 65-78. Magosfa Alapítvány, Vác





### CLIMATE CHANGE AREA

- overall presentation
- possibilities of prevention



### AGE

- 12-15



### TYPE OF USAGE

- formal education
- informal education



### DURATION

- Preparation: 20 min
- Activity: 30 min



### PLACE OF EXERCISE

- indoor setting
- outdoor setting

## Summary

The positive effects of globalization dazzled the whole world for many years but as the effects of climate change became more prominent year by year people needed to realize the other side of the coin. All our actions have an impact even in the most remote parts of the world. Can we continue with the same lifestyle with the knowledge that we might cause harm, violate someone's dignity or exploit others through our choices and consumption? Is there a solution?

### KEYWORDS

fairtrade; trade justice; colonialism; Global South; climate justice

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Participants get to know the manufacturers of certain products, their working conditions, their lives, and their problems.
- Participants learn why it is important to choose a fair-trade product from two seemingly identical products.

### METHODS

- game
- role play

### TOOLS AND MATERIALS

- YES and NO labels
- tape
- role cards
- questions

### PREPARATIONS

1. step: Stick the YES and NO labels into 2 corners.
2. step: Print and cut the role cards (they can be found in the attachments).
3. step: Be prepared with the questions.

### ARRANGING THE PLACE

We will need a bigger open space.

### DESCRIPTION

To understand climate injustice, we have to see that climate change is not just an environmental issue, but it has social, political, and ethical aspects. Because of colonialism, a division of labour emerged in which the colonized countries of the South became the suppliers of raw materials and agricultural institutions of the colonizers. For decades the International Monetary Fund and the World Bank provided aid to these countries and encouraged them to produce for

export since aid alone is not sufficient for economic growth. According to the international division of labour, the previously colonized countries should produce goods that they have an absolute advantage over. So, in many cases raw materials and agricultural commodities, products. However, a homogenous trade structure makes these countries vulnerable. If the world market prices of the exported products fall, it could have catastrophic consequences for these countries.

This results in two things. On the one hand, profitable processing is done in industrialized countries, so the surplus is added to the value of the product in developed countries. The developing countries then buy back the products after processing them at a much higher price. On the other hand, all the developing countries of the South have increased their exports of raw materials and agricultural commodities. Because of that, there will be an oversupply of these goods that will cause the prices to fall.

### Globalization

Globalization is the acceleration of the internationalization of the world, the whole process of worldwide unification (universalization) initiated by Western civilization.

The free-market economy is spreading worldwide, culture is becoming uniform, and Western and American patterns of values and life are being disseminated.

Our civilization started to become a global entity in the 19th century, because of the industrial revolution. Mass long-distance trade, the railways, steamships, the world press, and the telegraph all appeared at this time, fundamentally transforming human space and time. The two world wars somewhat set back this process, only to see it resurface with renewed vigour in the 1970s. This time, the globalization of the economy and society was also facilitated by huge international institutions: free trade agreements, economic integrations, the World Bank, the International Monetary Fund, GATT, then the World Trade Organisation, or the OECD, all came into being after the Second World War.

The globalization process is governed by transnational agreements and supra-national institutions.

The main features of economic globalization are interconnectedness of the world; increasing growth pressures; economic and cultural homogenization, consumer society; economic polarisation, increasing income disparities; concentration of economic and political power outside the democratically controlled sphere; increasing overpopulation; increasing environmental and social problems; erosion of civil rights; acceleration of information and communication technologies. As a result of the new institutions and new thinking, neoliberal policies - privatization, liberalization, and deregulation - have spread like wildfire.

And because of these policies, certain problems have escalated to unprecedented proportions:

- Social inequalities within and between countries have swollen to enormous proportions, and the environment has begun to deteriorate rapidly, threatening cultural and ecological diversity.

As a result, producers:

- have to get bank loans the more they need it, the worse the credit conditions available to them.
- They use pesticides that degrade the quality and damage the environment and the land.
- they take children out of school - saving on tuition fees and increasing production.
- because they are in a tight spot, they sell their crops to commodity speculators before harvest - even though they get the lowest price, they don't have time to wait for prices to rise (prices have long been set by commodity deals rather than the real market).

### TASK

#### 1. Yes-No game

One corner of the room is the YES CORNER, and the other is the NO CORNER (marked with labels). The facilitator asks questions to which the participants answer yes or no. They go to the right corner for their answer. You can find sample questions in the attachments, but any additional questions are fine.

#### 2. The chain brakes sometimes

The objective of the game is to foster participants' awareness of the varying circumstances and opportunities that people encounter in different parts of the world.

Gather the participants in the center of the room and let them form a large circle by joining hands. Explain the activity: each participant will receive a role card that represents a young person or child, allowing them to empathize with different life situations, "putting themselves in the shoes" of the people concerned. Read out a series of statements, and whenever a statement applies to someone, they should take a step forward while maintaining their hand-holding connection with others. If it becomes too challenging to hold hands, they may let go.

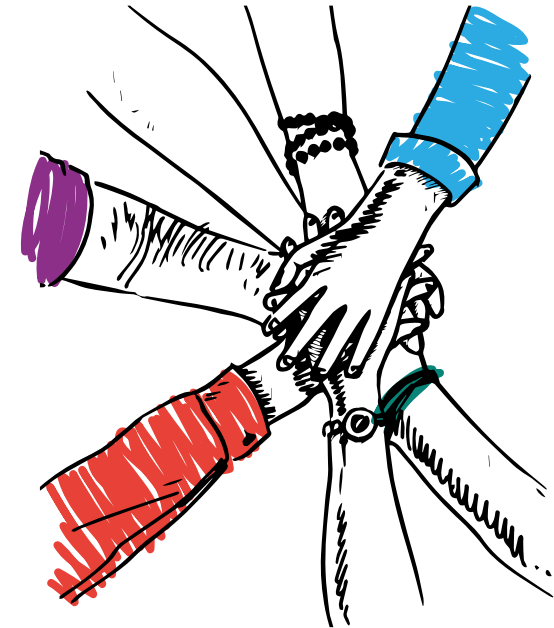
Distribute the role cards, ensuring that contrasting roles are placed next to each other, and instruct everyone to read their role card without revealing it to others. Proceed to read the statements in sequence (refer to the attachments). As each statement is read, individuals who relate to it should move forward. Eventually, the circle will break in certain places. The game concludes when all the statements have been read or there is no more room for movement.

### RELATED QUESTIONS

- Was it easy to decide if the statement was true about them?
- How did they feel when they couldn't move forward?
- Do they feel their current situation is fair?
- Would they exchange with other young people in their roles?
- Tell me some ideas on how these differences could be relieved!

### RESOURCES

Újszászi, Gy.: Fair trade termékek. In Neumayer, É., Zentai K. et al (2020): Fogyasztó kúra, p 245-253. Magosfa Alapítvány, Vác



# Household appliances in the past



## CLIMATE CHANGE AREA

- reasons for climate change
- possibilities of prevention



## AGE

- 12-15



## TYPE OF USAGE

- informal education



## DURATION

- Preparation: 15 min
- Activity: 20 min



## PLACE OF EXERCISE

- indoor location

## Summary

We are overwhelmed by a multitude of both small and large machines and gadgets that rely on electricity, batteries, and accumulators. But do we truly need all of them? How did people in the past accomplish tasks that we now rely on electrical appliances for?

## KEYWORDS

electrical equipment, creative solutions, the experience of elderly people

## PREREQUISITE KNOWLEDGE IS

- needed
- not needed

## LEARNING OBJECTIVES

Participants will recognize that not every task requires an electric device and will explore options for reducing energy consumption.

## METHOD (choose one from the list)

- brainstorming
- discussion
- research
- teamwork

## TOOLS AND MATERIALS

The table printed on an A3 sheet, copied according to the number of groups.

## PREPARATIONS

Print out the table on household appliances in black and white, in A3 size (according to the number of groups).

## ARRANGING THE PLACE

Arrange the tables to accommodate 4-6 small groups.

## DESCRIPTION

Divide the participants into 4-6 small groups. Within each group, discuss and fill in the second column of the table with the purposes for which we use the household appliances listed in the first column. Then, involve the elderly in solving the task. You can also add additional equipment to the list. One of the easiest ways for participants to gather information is by consulting their grandparents (or even great-grandparents) or by engaging with elderly individuals in their neighborhood. Another option is to visit a nursing home or invite members of a local elderly club to the event.

By the end of the task, you will discover that some appliances offer more benefits than disadvantages, as they simplify our lives (e.g., using an electric whisk is faster and requires less effort). However, you will also realize that certain appliances (e.g., electric bread slicers or crumb cleaners) require more energy to produce, maintain, and store, and their environmental impact outweighs the benefits they provide. Engage with the participants and collectively select, through voting, at least 6 appliances that would present a more sustainable choice today.

## RESOURCES

Activities of Magosfa Foundation

# Renaissance of Season



## CLIMATE CHANGE AREA

- possibilities of prevention
- sustainable consumption and production



## AGE

- 12-15



## TYPE OF USAGE

- informal education



## DURATION

- Preparation: 15 min
- Activity: 30 min



## PLACE OF EXERCISE

- indoor location

## Summary

Participants make a seasonal calendar about vegetables and fruits and learn why it is important to eat seasonal products whenever possible.

## KEYWORDS

seasonal fruits; seasonal vegetables; seasonal products

## PREREQUISITE KNOWLEDGE IS

- needed
- not needed

## LEARNING OBJECTIVES

- The participants should be aware of the importance of seasonal foods, both from a health and environmental perspective.
- The participants should consider choosing seasonal vegetables and fruits when shopping.

## METHOD (choose one from the list)

- brainstorming
- discussion
- systemizing

## TOOLS AND MATERIALS

- calendar drawn onto cardboard or packaging paper
- small carton cards
- crayons
- Scotch tape

## PREPARATIONS

Let's think through the actual seasonal fruits and vegetables.

## ARRANGING THE PLACE

Best if the participants sit in a big circle.

## DESCRIPTION

Globalization, technological advancements, and improved transportation have granted us access to a wide range of food throughout the year. However, our current food system and interconnected supply chains contribute to one-third of global greenhouse gas emissions. This leads us to consider global and local seasonality. Global seasonality refers to food being grown according to its natural growing season but consumed anywhere in the world, while local seasonality means the same, but the food is consumed within the same climatic zone in which it was grown. Both approaches have implications for our environment, health, and economy. Therefore, it is crucial to opt for a sustainable and well-balanced diet.

Seasonal and fresh fruits and vegetables not only taste better but also offer greater nutritional value. Consuming them reduces the risk of many illnesses. Organic farming requires less energy as it eliminates the need for artificial lighting, heating/cooling systems, and growth control substances. We don't have

# Renaissance of Season

to harvest the produce prematurely. The use of chemical pesticides to protect plants contributes to air, water, and soil pollution, as well as biodiversity loss. Additionally, imported food, besides the growing, storing, and packaging, requires more transportation, resulting in increased energy consumption. Furthermore, locally grown and seasonal food is often more affordable compared to imported alternatives. By purchasing organic and local food, we support our local farmers.

### TASK

#### 1. Domestic and foreign fruits and vegetables

Gather a variety of fruits and vegetables by asking participants questions and listing them on a board or an A3 paper. Group them based on whether they are domestically or internationally sourced. Let's examine the imported ones together: Which countries do they originate from? Take a look at the map and estimate the distance (in kilometers) they travel to reach our country. How do they remain preserved over long periods (consider refrigerated storage (energy need!), unripe harvesting, preservatives)? Let's discuss their nutritional value in comparison to domestic fruits and vegetables. Which do you believe contributes to higher energy consumption and CO2 emissions when reaching domestic consumers?

Identify fruits and vegetables that are also shipped from abroad, even though they are grown locally. Determine which ones are worth buying and explain why.

#### 2. Seasonal calendar

Define seasonal fruits and seasonal vegetables. What are the advantages of considering the season when shopping and consuming food (considering health, environment, energy, and CO2 emissions related to transport, heating, refrigeration, pesticides, fertilizers, etc.)? Which crops are easier to store during the winter? Reflect on all the topics we have discussed so far.

*Creating the seasonal calendar on wrapping paper or large cardboard.*

Engage the participants in drawing domestic vegetables and fruits on small cartons using crayons (each participant should draw three copies). Prepare a large piece of cardboard to serve as the calendar, with the names of the months

written at the top as the header. Attach the drawn pictures to the calendar in their appropriate positions.

For an easier version, simply write the names of the fruits in the calendar without attaching the pictures.

#### Note:

*An example of a Hungarian seasonal calendar can be found in the attachments.*

### EXTENSIONS/VARIATIONS

You can encourage participants to bring some seasonal fruits and vegetables to share with the class.

### RESOURCES

Zentai, K.: Az idény reneszansza. In Neumayer, É., Zentai K. et al. (2020): Fogyasztó kúra, p. 146-150. Magosfa Alapítvány, Vác

Macdiarmid, J.: Seasonality and dietary requirements: Will eating seasonal food contribute to health and environmental sustainability? In Proceedings of the Nutrition Society, 73(3), p. 368-375. doi:10.1017/S0029665113003753

Schulp, J.A.: Reducing the food miles: Locavorism and seasonal eating. In Sloan, P., Legrand, W. et al. (2015): The Routledge Handbook of Sustainable Food and Gastronomy, p. 120-126.

<https://www.bbc.co.uk/bitesize/topics/zjr8mp3/articles/zb23p4j>

[https://europa.eu/climate-pact/resources\\_en](https://europa.eu/climate-pact/resources_en)



# Complex programs

## Slow kitchen, slow city

# 2.7



### CLIMATE CHANGE AREA (basis of the sequence of activities)

- possibilities of prevention
- healthy food
- food sovereignty



### AGE

- 12-15
- 15-18
- 18+



### TYPE OF USAGE

- informal education



### DURATION

- Preparation: 20 min
- Activity: 30 min



### PLACE OF EXERCISE

- indoor location

## Summary

“Slow food” is the answer to fast food because of its circumstances and quality. Food sovereignty, local green movements that are also responsible for the city’s image, traditional and local flavours as well as products support “slow life”.

We taste a type of food which we can make or also buy in the store. We can put together the ingredients with the participants while we are talking about the difference between natural and healthy materials and artificial ingredients in foods. During this workshop, we can taste and eat both the homemade and bought-in-the-store versions.

### Note:

*In this activity, we make a typical Hungarian food named ‘körözött’. It is a tasty, easy-to-make cottage cheese cream. We only need a few, natural and healthy ingredients to make it and when it is done, we can spread it on a slice of bread. This type of cream is also available in shops produced by the food industry with artificial ingredients, packaged in plastic jars.*

*Choose a similar food that is popular or traditional in your country and that can be made at home, but you can also buy it in the shops.*

### KEYWORDS

food sovereignty; healthy eating; natural ingredients; animal husbandry; crop production

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

- Participants will discover that simple, healthy ingredients can be used to make delicious food at home instead of artificial food bought in the store.
- They learn about the environmental problems caused by food production.

### METHOD

- discussion
- hands-on activity
- teamwork

### TOOLS AND MATERIALS

- ‘körözött’ from store
- toast bread
- cottage cheese
- sour cream
- sweet red peppers powder
- red onion
- other spices (cumin, pepper, basil, thyme, summer savory)
- house bread
- cutting board
- good knife
- forks
- bowls

### PREPARATIONS

Prepare tools and ingredients for making and tasting the ‘körözött’.

# Slow kitchen, slow city

## ARRANGING THE PLACE

We need a large table that can be covered by a tablecloth, where we will prepare the “körösött”, at a leisurely pace, i.e., slowly as in “slow food”.

## DESCRIPTION

The introduction of fast food in the late 19th century not only changed the way of food service but it affected the food industry as well as agriculture. The focus was on faster service while keeping the prices low and the food quality the same. The latter meant that they started to produce identical-looking food, trying to recreate the same taste and shape. The concept and later the reality of saving time attracted the crowds. New venues were established and slowly this innovation spread around the world. The companies running them could no longer depend on local, independent, small-scale farmers. They needed mass production. Many of the food we eat looks the same as a generation ago, although they have fundamentally changed. Food became an industrial commodity manufactured and assembled in quite a different way. The adoption of new flavors and colors has become increasingly prevalent, along with innovative methods of food preservation. While some of these changes have had positive outcomes, others have had negative consequences. As a result of the evolving food industry, there has been a shift away from utilizing fresh, safe ingredients and consuming whole foods.

The greatest example of the new food industry is if we look at the meat in a hamburger. Fifty years ago the patty of a burger was probably processed and made by a local butcher or a small meat processing company. Today it is typical that a meat processing company buys the livestock of different big-scale farmers. By big scale, we mean that the livestock is held in a confined space so the farmers can provide as much raw material as possible to the processing company. This is how they try to maximize their profits and the increasing need for meat. However, this has side effects since these animals are more prone to diseases, so they need more medication to keep the health of the livestock. Many of the farmers also try to reduce their expenses by cutting back on the feeds with the use of substitutes. Both can affect the quality of the meat. Moreover, on the principle of similarity, they use more ingredients, and additives to achieve the same-looking product - the perfect, flat, round-shaped patty.

Global economic competition and its influences are pushing local, traditional products to the background threatening the sustainable ways of food production. The Slow Food Movement is a global initiative with a simple purpose: “preventing the disappearance of local food cultures and traditions and encouraging people to prepare and eat locally-sourced whole food” (<https://www.slowfood.com/>). It questions large-scale industrial agriculture because of its environmental and health impact. The movement points out the dangers of overproduction and food waste. They emphasize the importance of local ecosystems and biodiversity.

## TASK

We can make simple and delicious dishes from fresh vegetables or animal-derived foods. In some cases, we can buy the same or similar food in the store, as a product of the food industry. During the activity, while making the cream, talk about healthy foods, the natural and artificial ingredients in foods, large-scale and domestic animal husbandry, and global animal husbandry issues. Keeping cattle may be the main topic in the case of cottage cheese cream, but when choosing other ingredients (e.g., eggs, fish) you can talk about the conditions of keeping hens or the problems of the fishing industry.

### The slow - creative – ‘körösött’

Our starting point is a store-bought, plastic jar of ‘körösött’ and a package of toast bread. We can prepare the same dish by ourselves (as our ancestors have done for centuries): bring cow’s cheese, sour cream, butter, sweet, red peppers powder, cumin, and red or sweet onions or spices (see in Tools and materials). And homemade bread or sourdough bread.

In a bowl, mix the cottage cheese, a little sour cream, the cumin, and the sweet, red pepper powder. Meanwhile, chop the onion (or pepperwort) and add it to the cream. Stir it, and salt lightly, if too dry, add a little sour cream. In the meantime, we will also discuss the above-mentioned topic.

The following step is a comparison of the two ‘körösött’ variations. First, we open the store-bought ‘körösött’ (i.e., the control sample) and read the ingredients as indicated on the package. Also, we can list what chemicals are NOT in our homemade ‘körösött’, and everyone can get a bite from both to compare the taste of both.

## RECIPE:

### The slow - creative – 'körözött'

- 250 g of cottage cheese,
- approx. 2 tablespoons of sour cream,
- 2 teaspoons red peppers powder,
- 1 teaspoon cumin,
- ¼ teaspoons salt,
- approx. 1 medium head onion  
(red or sweet.)  
or an equivalent amount of pepperwort.

We can safely make twice these quantities for 20 people. It will be so delicious you'll run out anyway!

## EXTENSIONS/VARIATIONS

Entrepreneurial teachers can even plan a camp day on this topic.



## RESOURCES

Vásárhelyi, J.: Lassú konyha, lassú város. In Neumayer, É., Zentai K. (2020): Fogyasztó kúra, p. 281-286.  
Magosfa Alapítvány, Vác

<https://www.slowfood.com/>



## CLIMATE CHANGE AREA (basis of the sequence of activities)

- tackling problems related to climate change through nature-inspired learning



## AGE

- 12-16



## TYPE OF USAGE

- formal education
- informal education



## DURATION

- Preparation: 2 – 3 hours (depending on previous knowledge of the topic)
- Activity: 50 min/module



## PLACE OF EXERCISE

- indoor location

## Summary

Biomimicry is a design methodology that draws inspiration from nature for **sustainable** design. It is an interdisciplinary approach that combines principles from nature, biology, design, and technology.

### KEYWORDS

tackling problems related to climate change, sustainable design, modules, nature-inspired innovations

### PREREQUISITE KNOWLEDGE IS

- needed
- ~~not needed~~

### LEARNING OBJECTIVES

- Introducing nature-based solutions.
- Recognizing that we need to cooperate with nature to mitigate the effects of climate change.
- Recognizing that we are part of nature and the ecosystem.

## MORE INFORMATION ABOUT THE METHOD AND RELATED MATERIALS

### 1. Key elements of the website:

- Website: <https://biolearn.eu/>
- Universal manual: <https://biolearn.eu/universal-manual/>
  - See modules with a short summary, length, and connected subjects
- Teacher training guide: [https://biolearn.eu/wp-content/uploads/2021/11/BiolearnTeacherTraining\\_EU.pdf](https://biolearn.eu/wp-content/uploads/2021/11/BiolearnTeacherTraining_EU.pdf)
  - Background knowledge
  - Approaches to biomimicry thinking
- Module structure: [https://biolearn.eu/wp-content/uploads/2021/08/HowToUse-theToolkit\\_EN.pdf](https://biolearn.eu/wp-content/uploads/2021/08/HowToUse-theToolkit_EN.pdf)

### 2. Biomimicry in education:

- Applicable in STE(A)M education and in ESD as well
- Integrating multiple fields of science and reality
- Relies on the wisdom of nature to promote sustainability learning
- Enhances creativity, critical thinking, problem-solving skills, and collaboration

### 3. Modules about two approaches to biomimicry thinking:

- Marvellous models: from biology to design
- Packaging: from challenge to biology

### 4. Modules related to climate change:

- 9 principles: Nature's principles for a sustainable world
- Big Biomimicry challenge: Nature-inspired solutions to some of life's biggest challenges (SDGs)
- Adaptation to Climate Change: experiments about CC
- The Natural Economy: Introduction to the circular economy
- Water, Water Everywhere: Replacing water bottles
- Packaging: Learning sustainable packaging from nature
- Water Management in a City Park: Natural management at a multipurpose city park
- Buildings: Ideas from nature – how to make our buildings more sustainable

# Complex programs

# Sustainability audit

# 2.9



## CLIMATE CHANGE AREA (basis of the sequence of activities)

- sustainable living
- energy consumption
- waste



## AGE

- 12-18



## TYPE OF USAGE

- formal education
- informal education



## DURATION

- Throughout the year.



## PLACE OF EXERCISE

- indoor location

## Summary

Sustainability audits provide practical knowledge of sustainable living by systematically analyzing the institution or building where we work. Through this analysis, we can identify possible solutions and offer suggestions for improvement. Prerequisite knowledge is not required

## KEYWORDS

sustainable living, energy consumption, waste management, management

## PREREQUISITE KNOWLEDGE IS

- needed
- not needed

## LEARNING OBJECTIVES

- Observing and recognizing the overall aspects of sustainable living from waste management to energy consumption and transportation, etc.
- Thinking about the carbon footprint of an institution or building.

## METHODS

- survey
- interview
- teamwork

## TOOLS AND MATERIALS

- prepared online survey with the questions
- list of emails of people you need to contact to get information for the audit

## DESCRIPTION

In addition to theoretical knowledge, practical knowledge of sustainable living is crucial for adopting a sustainable approach. Conducting a sustainability audit on the institution or building where you work is an effective way to acquire practical knowledge. Alternatively, sustainability aspects can be considered during the design stage, which is a more cost-effective method.

Sustainability audits help institutions and buildings start at a minimum sustainable level and progressively improve their sustainability performance. Rather than aiming for maximum sustainability all at once, it's important to commit to taking small steps toward greater efficiency year by year. Hiring an external expert for the audit may highlight gaps in our understanding, potentially discouraging action. Therefore, it is preferable to educate ourselves and those around us, improving not only the institution's efficiency but also our own knowledge. It's also crucial to involve a team and make the audit a collective effort.

## PREPARATION

Recruit colleagues and individuals employed within the institution to form a collaborative team responsible for planning and executing the audit. In consultation with the stakeholders, establish the tasks and objectives. It is important to repeat the audit periodically. The subsequent audit will assess the achievement of previous objectives and introduce new aspects for evaluation. It's crucial to avoid setting unattainable goals due to factors beyond our control. Instead, the goals should be feasible for the participants to work on. By approaching the audit method diligently, we will engage in a profound learning process and foster a sustainable mindset within the entire institution community.

# Sustainability audit

## TO SUCCESSFULLY CONDUCT AN AUDIT, FOLLOW THESE KEY STEPS:

1. Assemble a dedicated team to carry out the audit. It is advisable to have a group leader and involve as many individuals as possible, preferably including someone from the management or colleagues.
2. Collaboratively plan the areas to be tested and the criteria against which they will be evaluated. When selecting aspects for the initial audit, avoid overwhelming the team with an excessive number of tasks that could lead to potential failures. From those listed, choose the aspects that align with the specific circumstances of the institution and that can be realistically assessed based on the team's capacity.
3. Let the group determine one or more dates for conducting the audit. The survey should be conducted collectively by the team.
4. Prepare a report detailing the study, including the names of the participants, the schedule, the audit date, the evaluation criteria, and the findings.
5. Following the completion of the audit, convene the team to discuss and plan the way forward until the next audit. Communicate the audit results, proposed objectives, and tasks to the responsible individuals, such as the management or relevant stakeholders.
6. During the subsequent audit, verify the achievement of previously set objectives and, if necessary, enhance the focus on improving environmental compliance.

## THE FOLLOWING LIST PROVIDES GUIDANCE FOR PREPARING AN AUDIT PLAN AND HIGHLIGHTS ASPECTS IN VARIOUS AREAS THAT MIGHT REQUIRE AN AUDIT. THIS LIST IS NOT EXHAUSTIVE:

### 1. Transport

- How many employees and residents use public transport? \_\_\_\_\_
- How many people work or live in the city? \_\_\_\_\_
- Are there secure bicycle storage facilities? \_\_\_\_\_
- How many people walk to work, and what is their combined distance? \_\_\_\_\_
- How many people use cars for commuting, and what is the total distance travelled? \_\_\_\_\_
- How many people carpool?  
Are there carpooling programs or initiatives? \_\_\_\_\_
- What form of transport is used to get to events outside the institution?

---

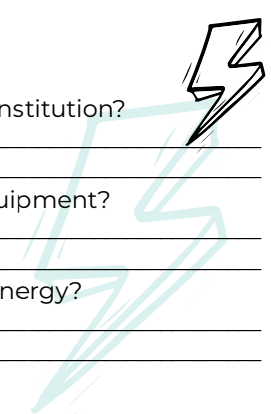
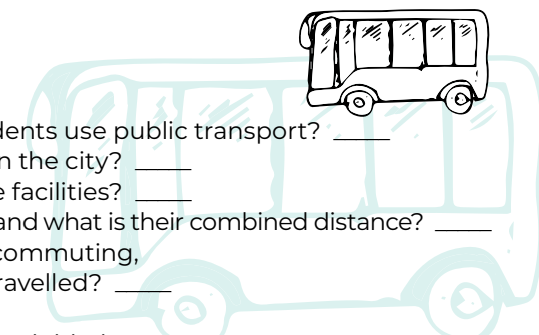
---

### 2. Energy

- What is the annual fossil fuel consumption of the institution?
- Does the institution use any renewable energy equipment?
- What is the ratio of non-renewable to renewable energy?
- How efficient is the combustion plant?

---

---

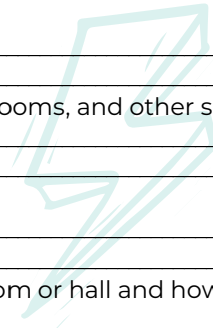


# Sustainability audit

- Are the walls, attics, and floors insulated, what is the U-factor?  
\_\_\_\_\_  
\_\_\_\_\_
- What is the condition of the windows and doors, are they insulated?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any windbreaks?  
\_\_\_\_\_  
\_\_\_\_\_
- How often are they ventilated?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any shading devices?  
\_\_\_\_\_  
\_\_\_\_\_
- Is there air conditioning?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there heat-reflecting mirrors behind the radiators?  
\_\_\_\_\_  
\_\_\_\_\_
- Is it possible to control the temperature of the radiators?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any heat buffers?  
\_\_\_\_\_  
\_\_\_\_\_
- What happens to the heating at weekends and on public holidays?  
\_\_\_\_\_  
\_\_\_\_\_
- What is the humidity level and how is it controlled?  
\_\_\_\_\_  
\_\_\_\_\_
- Are the heaters covered by the curtains/blinds?  
\_\_\_\_\_  
\_\_\_\_\_



- How many degrees are provided in the different rooms?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any evaporators and is there any green vegetation?  
\_\_\_\_\_  
\_\_\_\_\_
- How many and what kind of green plants are there?  
\_\_\_\_\_  
\_\_\_\_\_
- Total capacity of electricity consumers.  
\_\_\_\_\_  
\_\_\_\_\_
- How well are the consumers used, are there any unnecessary consumers?  
\_\_\_\_\_  
\_\_\_\_\_
- Can stand-by be controlled centrally?  
\_\_\_\_\_  
\_\_\_\_\_
- Is there motion-sensing lighting in areas not frequently used, e.g., toilets?  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any timers? E.g., corridor lighting?  
\_\_\_\_\_  
\_\_\_\_\_
- Is it possible to use natural lighting in halls, rooms, and other spaces?  
\_\_\_\_\_  
\_\_\_\_\_
- What lighting equipment/bulbs are used?  
\_\_\_\_\_  
\_\_\_\_\_
- How many light switches are there in the room or hall and how are they distributed? \_\_\_\_\_
- Are the light switches marked, e.g. A - window facing, F - wall facing?  
\_\_\_\_\_  
\_\_\_\_\_



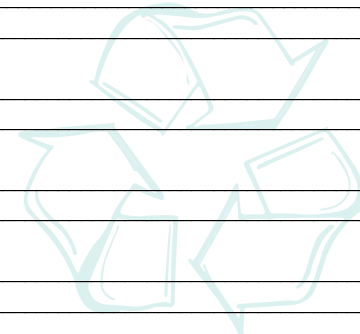
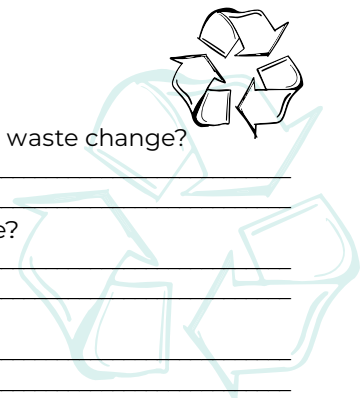
# Sustainability audit

- Are the light fittings dirty?  
\_\_\_\_\_
- How much energy is used for lighting?  
\_\_\_\_\_  
\_\_\_\_\_
- Is the TV/video completely switched off, or is it in standby mode?  
\_\_\_\_\_
- How many degrees is the temperature set at? \_\_\_\_\_
- How is coffee or tea kept warm?  
\_\_\_\_\_  
\_\_\_\_\_
- Are the taps water efficient?  
\_\_\_\_\_  
\_\_\_\_\_
- How much water do the toilets flush with? (Water-saving mode?)  
\_\_\_\_\_  
\_\_\_\_\_
- Are there any dripping taps?  
\_\_\_\_\_  
\_\_\_\_\_

- Is the collection point used?  
\_\_\_\_\_
- If there is no collection point, is it signposted where the nearest collection point is? \_\_\_\_\_
- Do they know the collection points for different types of waste, is there any connection with them? \_\_\_\_\_
- Do they know the collection points?  
\_\_\_\_\_  
\_\_\_\_\_
- Is e-waste collected and what happens to it? Is e-waste taken back when new equipment is purchased? \_\_\_\_\_
- What happens to waste collected separately?  
\_\_\_\_\_  
\_\_\_\_\_
- If the disposal is possible, is there a composting site?  
\_\_\_\_\_  
\_\_\_\_\_
- What happens to the compost?  
\_\_\_\_\_  
\_\_\_\_\_
- What packaging materials are chosen when purchasing if there is an opportunity to choose? \_\_\_\_\_
- How much paper is used?  
\_\_\_\_\_  
\_\_\_\_\_
- Is there reuse or recycling?  
\_\_\_\_\_  
\_\_\_\_\_
- What happens to the paper waste?  
\_\_\_\_\_  
\_\_\_\_\_

### 3. Waste

- How does the amount and composition of solid waste change?  
\_\_\_\_\_  
\_\_\_\_\_
- Is there a local selective waste collection service?  
\_\_\_\_\_  
\_\_\_\_\_
- Is there a collection point for used batteries?  
\_\_\_\_\_  
\_\_\_\_\_





# Sustainability audit



## 4. Catering/kitchen

- Where do the raw materials come from and how much do they travel?  
\_\_\_\_\_
- Are there any certified organic raw materials and in what proportion?  
\_\_\_\_\_
- Is there conscious planning for healthy eating?  
• What happens to food waste?  
\_\_\_\_\_
- What happens to used cooking oil?  
\_\_\_\_\_
- Is there individualized rationing in catering?  
\_\_\_\_\_
- What is used to wash the dishes?  
\_\_\_\_\_
- Where does the hot water come from?  
\_\_\_\_\_



## 5. Awareness raising, Training

- Are there any training courses on sustainability? \_\_\_\_\_
- Is there a forum on sustainability education? If so, how often?  
\_\_\_\_\_
- Are there any hosts for sustainability events and practices?  
\_\_\_\_\_
- Are there any established indicators and metrics related to sustainability?  
\_\_\_\_\_
- Are there any indicators and metrics to monitor the development of knowledge and attitudes regarding sustainability? \_\_\_\_\_
- Do you maintain contacts with NGOs active in the field?  
\_\_\_\_\_
- Are there any external events in this context? \_\_\_\_\_

# Complex programs

# Electronic devices

# 2.10



## CLIMATE CHANGE AREA (basis of the sequence of activities)

- Planned obsolescence
- Electronic waste



## AGE

- 14+



## TYPE OF USAGE

- formal education
- informal education



## DURATION

- preparation: 20 min
- activity: 45 min



## PLACE OF EXERCISE

- indoor
- outdoor

## Summary

Electronic devices are part of our everyday life. Having a smartphone, a TV or a laptop is not uncommon anymore. But do we know the background of these devices? What are the consequences of production? Let's find out in this exhibition that we created to better understand the true life of our devices.

## KEYWORDS

Electronic waste; raw materials; planned obsolescence

## PREREQUISITE KNOWLEDGE IS

- needed
- not needed

## LEARNING OBJECTIVES

- Participants will discover the complexity behind electronic waste and the exploitation connected to electronic devices.
- Participants will get tips and hacks about conscious consumption regarding electronics.

## METHODS

- role play
- discussion
- research
- teamwork

## TOOLS AND MATERIALS

- The attachment is printed onto A3 sheet.  
We recommend to choose a thicker paper.

## PREPARATIONS

Read through the exhibition. Print it out and prepare it by pinning it on the wall or any other place suitable so the participants would have the chance to go around and read the exhibition. You can find a related situation game called electronic devices in chapter 1.4. This can be played after the exhibition.

## ARRANGING PLACE

Arrange the place so participants could get closer to the slides.

## ATTACHMENTS (WORKSHEETS, PICTURES, ETC.)

slides

# Complex programs

## Dig deep

# 2.11



### CLIMATE CHANGE AREA

- exploitation
- exploiting nature and mankind
- impact of the mining industry on the environment



### AGE

- 14-18



### TYPE OF USAGE

- informal education
- formal education



### DURATION

- preparation: 1 day
- activity: 3 months



### PLACE OF EXERCISE

- online
- 3rd round: indoor or outdoor location with projection equipment available

## Summary

The use of various electronic devices has become an integral part of our daily lives. However, we often have limited knowledge about the origins of these devices and the significant global, environmental, and social impacts, including in Third World countries, caused by the extraction of rare raw materials used in their production and manufacturing. By participating in this competition, contestants will explore the dilemmas of global sustainability. The competition includes a worksheet, an answer sheet, and the key for each round.

### KEYWORDS

mining industry, e-waste/WEEE, carbon cycle, exploitation, sustainability

### PREREQUISITE KNOWLEDGE IS

- needed
- not needed

### LEARNING OBJECTIVES

The participants

- discover and understand the circumstances necessary to produce electronic devices and their environmental and social consequences.
- learn about the impact of the mining industry on nature and human health.

### METHODS

- brainstorming
- discussion
- systematic organization

### TOOLS AND MATERIALS

- worksheet
- answer sheet
- pencil, pen
- prize (a gift pack of assets encouraging a sustainable lifestyle)
- award certificate

### PREPARATION

- **Step 1:** Create an invitation and an application form for the contest. The application form should include the relevant data, such as the name of the group, the names of group members, the contact person's email and postal address and a privacy policy statement.
- **Step 2:** Advertise the competition on various social media platforms as well as offline channels.
- **Step 3:** Once the application deadline has passed, distribute the worksheets and answer sheets to the participants via email. Allow a 2 to 4 week time-frame for completing each round.
- **Step 4:** The third round should be an in-person meeting, where the first

## Complex programs

# Dig deep

# 2.11

10 groups achieving the most points in the three rounds shall be invited. At this meeting, the groups can present to each other their entries for the third round, and then receive gift packs and certificates to acknowledge their successful participation.

- **Step 5:** Share and promote the display materials created by the groups on social media platforms. For offline materials, arrange an exhibition.

### DESCRIPTION

The contest should be advertised for groups of 3-4. The worksheets and answer sheets should be sent out to the contestants via email. Provide 2-4 weeks to submit the tasks. The answer sheets can be assessed using the provided answer key in the attachments.

### EXTENSIONS/VERSIONS

If organizing all three rounds is not desired, the first round can serve as a standalone contest. It can be conducted in person during a workshop or training program. In this scenario, participants of the workshop or training program can be divided into groups on-site, and 2x1.5 hours should be provided for them to complete the worksheet.



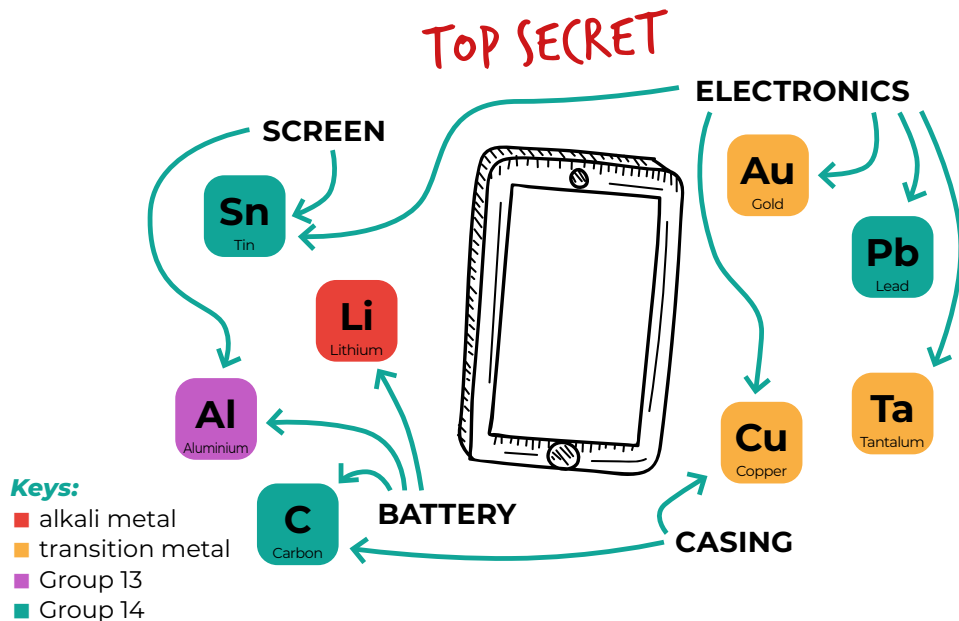
# Complex programs

## Dig deep - Round 1

2.11

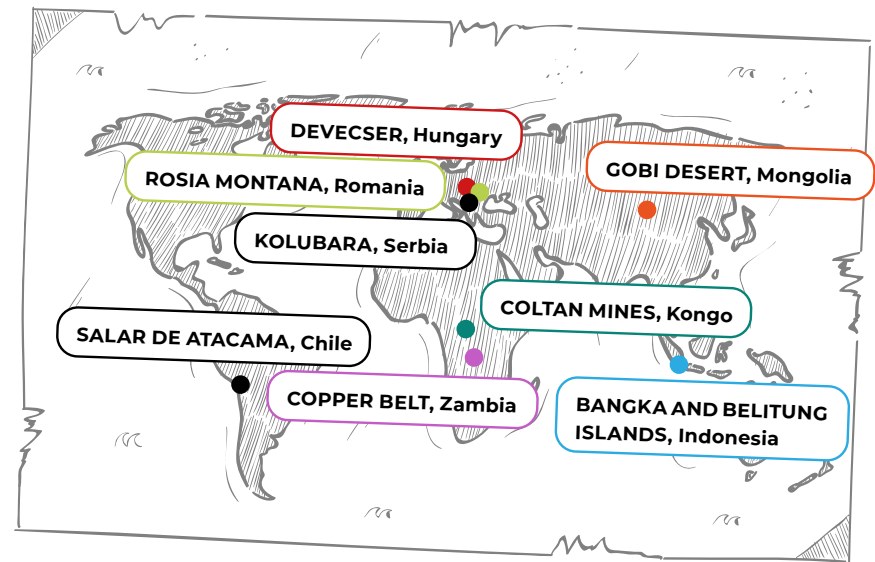
DEAR TEAM,

Thank you for joining the Extractive Industries mission outlined below. One of our colleagues received information concerning the leader of a prominent international expedition group, whose name we cannot disclose. The group was investigating extractive industries projects across five continents, including their latest exploration in Mongolia. Unfortunately, the leader went missing shortly after sending us the following picture from his phone:



We have recovered the route map of the expedition and the diary of the lead expert, which are provided below. However, the diary notes are incomplete. Based on the picture and the available notes, our international research group is required to prepare a report on the expedition. As we continue our tireless search for the lead expert day and night, we are pressed for time and have sought assistance in preparing the report. We believe that the diary notes might contain clues about the expert's current whereabouts. Therefore,

your team's task is to investigate the connections between the picture, the map, and the diary notes. Based on your findings, please write the expedition report, complete the answer form, and help us locate the lead expert.



## EXPEDITION DIARY

### 5 JANUARY, DEVECSER REGION, HUNGARY

Today, we met with the other members of the expedition team in Devcsér. The team consists of R, the French photographer and videographer, S, the Brazilian research assistant, and myself, the lead expert. We had a wonderful time together, and I prepared a traditional Hungarian dinner for everyone, which they enjoyed. To stay fit, I might join S for her morning run. Since we arrived at our accommodation quite late, we watched a short movie about the Devcsér case and engaged in discussions with the local residents we had invited.

# Complex programs

## Dig deep - Round 1

# 2.11

### TASK 1 for the Expedition report:

To list the short and long-term effects of the 2010 red mud disaster on the population and the environment. Limit your answer to half a page.

### TASK 2 for the Expedition report:

To calculate the amount of waste generated through mining enough gold for a wedding ring (5g), and to answer the following questions: Approximately how many tons of fish died from the 2000 Baia Mare cyanide spill, and for how many individuals was access to clean drinking water temporarily unavailable? Besides Hungary, where else has gold mining with cyanide been banned?

#### 15 JANUARY, KOLUBARA, SERBIA

There are many coal mines operating in the Balkans – still Kolubara lignite mine was a good choice for the expedition: 600 km<sup>2</sup> and just 60 km from Belgrade! The lignite then is burned in power plants to provide the major part of Serbia with electricity. Today we looked at the mine plans and talked with local people living in nearby villages – they spoke a lot about the health and social effects of the mine.

### TASK 3 for the Expedition report:

To draw a human figure and list the health impacts of coal smoke on the various organs of the human body (the list should be linked to the given area of the body).

#### 25 JANUARY, SALAR DE ATACAMA, CHILE, SOUTH AMERICA

We suffer a lot from the aridity of the Atacama Desert. Evaporation (brine) pools everywhere near the mine. Trucks roam to and fro all the time, we need to defend ourselves from the dense salty dust with masks.

### TASK 4 for the Expedition report:

To briefly summarize why it is incorrect to claim that mining lithium in the desert has no consequences.

#### 5 FEBRUARY, KONGO, COLTAN MINES

Local people in Kongo are welcoming hosts but you can feel the tension as we approach the mines. I needed to get special permits just to shoot some photos in the villages around the mines. The local culture is amazing, R. shoots photos like crazy.

### TASK 5 for the Expedition report:

I need to write a brief article to domestic news outlets detailing what I witnessed, my thoughts on the situation, and an analysis of the prevailing issues around the coltan mines in Kongo. The article should not be longer than half a page.

#### 20 FEBRUARY, COPPER BELT, ZAMBIA (KABWE, MUFULIRA VILLAGES)

We have been in Zambia for two weeks now, and the entire group is feeling increasingly tired. However, R. is in a worse condition compared to the others. During the initial days of our stay, he quickly formed close bonds with the locals and even assisted in painting the school to create a more welcoming atmosphere. I am deeply concerned about his symptoms, including limb numbness, muscle weakness, headaches, abdominal pain, and high blood pressure. His mood swings and frequent forgetfulness are alarming, and his behavior has become quite unusual. Although his symptoms seem indicative of some form of poisoning, we are unable to make a definitive diagnosis at the moment. Unfortunately, the doctor is currently unavailable, and we do not currently have access to the Internet.

### TASK 6 for the Expedition report:

To identify the chemical element that can cause these poisoning symptoms.

#### 28 FEBRUARY, BANGKA AND BELITUNG ISLANDS, INDONESIA

The Indonesian islands are beautiful but we did not come here on vacation! Sometimes the environmental and social circumstances of mining can be improved due to international and local public pressure: I found this at Rosia Montana and here at the Bangka tin mine as well.

# Complex programs

## Dig deep - Round 1

# 2.11

### TASK 7 for the Expedition report:

To briefly summarize how the Bangka situation has improved.

### TASK 8 for the Expedition report:

To calculate the quantity of tin, in grams, used by an average European family household during a generation (30 years)? According to my file about tin, the average tin contents are the following: tablets and similar: 1-3 g, laptops: 2,4-3,4 g, LCD flat TVs: 5 g, and cars: 15 g.

#### 10 MARCH, MONGOLIA

Weather conditions: Dust storm alert! We have found shelter in the yurt of a Mongolian nomad family, who graciously welcomed us. The freezing temperatures outside contrast with the pleasant climate within the yurt. Our host, Sukhgerel, shared with us that dust storms have been occurring more frequently, even affecting areas at a considerable distance from the mine. Unfortunately, our Russian interpreter has indulged in a bit too much koumiss, a fermented alcoholic beverage made from mare's milk, and given the intensity of the dust storm, we have decided to take a day of rest. On the bright side, this provides an opportunity for me to organize and arrange my notes.

### TASK 9 for the Expedition report:

Where do people use these chemical elements (from mine we analyze at this expedition) in everyday life? Yesterday I already listed the usage areas with which I only need to connect the chemical elements – but my notes were thrown into disarray in the dust storm... :(

#### Elements

Lithium  
Tin  
Lead  
Copper  
Tantalum  
Gold  
Carbon

#### Usage area

TV, Laptop  
Packaging can  
Baby toys  
Graphite pencil  
Electronic cable wires  
Printing  
Jewellery, coins  
Battery  
Bowls  
Paint (from the '70s)  
Car  
Bronze statue  
Tin  
Mobile Phone

Aluminum

Medicines, cosmetics

#### 13 MARCH, MONGOLIA

Still, in Mongolia, this time we pursue the financial aspects of mining.

### TASK 10 for the Expedition report:

To compile a list of cases where mines are funded by banks using European taxpayer money, even though concerns exist regarding the mine's operations. During our expedition, there are three mines fitting this description, and we are tasked with providing their names and the names of the respective banks providing the funding.

### TASK 11 for the expedition report:

I need to find a good definition for the 'raw materials curse' phenomenon. Then, based on all the examined mines in the expedition, I need to summarize the main (positive and negative) economic, social, and environmental impacts in connection with the mines, in a table. I need to focus only on those impacts that directly affect the lives of local communities and the surrounding neighborhoods.

#### 19 MARCH, MONGOLIA

As the expedition finishes, I am working on the summary materials. Before writing the report I go out and get some air around the 'Turquoise Hill' and then wander around in a location whose name gives the following anagram when rearranging the letters:

ARUBATALANA

# Complex programs

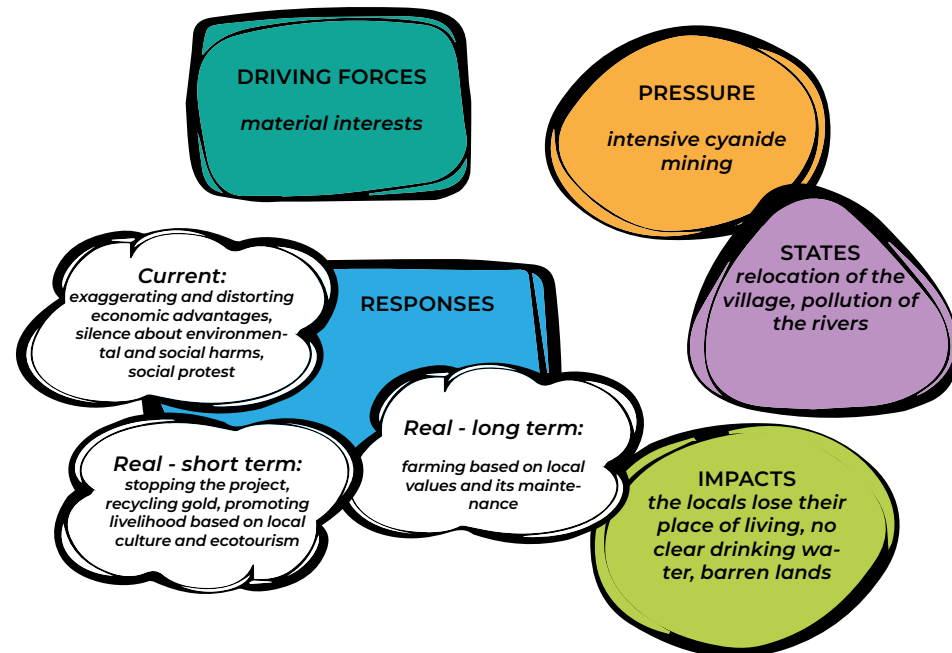
## Dig deep - Round 2.

2.11

DEAR TEAM,

Let the mission continue! Congratulations, your team found the lead expert in Ulaanbaatar! With your help, the expedition report is almost finished – still, some summarizing paperwork is needed. However, our lead expert is in a bit of trouble. He is acting a bit confused and he cannot really remember the previous days, except that he was walking in Ulaanbaatar.

He still remembers that he has to submit the final report. So again he needs your help in doing it due to his memory loss. For this read his notes and answer the questions on the separate answer sheet. "I adopted a cause-effect cycle which helps me to create an overview of the information gathered. Based on this I can follow the drives behind mining, their impacts, and connections. Our expedition funder will be pleased!"



### 1. My tasks for the cause-effect graph

**1 a).** I started to fill in the cause-effect cycle for the Rosia Montana gold mine. I need to fill in the remaining parts – please help me, Team!

This file may help: [Attachments\\_Rosia Montana file](#)

**1 b).** I need to fill in the whole cycle for the tin mines in the Indonesian Bangka and Belitung islands. Unfortunately, I forgot what to write there, I hope the student team can help me.

The file is here: [Attachments\\_Tin file](#)

I also need to analyze what happens to the e-waste from obsolete mobile phones and other devices in my country.

### Task 2

Oh, I left this part as one of the last tasks. But now I need to ask the team to research and summarize what happens in their country after electronic devices become e-waste. Max. half a page.

I also need to analyze the full life cycle of a mobile phone – what (adverse) environmental impacts the phone has in its different cycle stages and I need to recommend solutions to minimize these impacts.





# Dig deep - Round 2.

### Task 3

I've only created rough sketches for this task. I need to provide explanatory text for the graph depicting the different stages of the mobile phone life cycle, including the mining of raw materials and options for reuse or disposal. Additionally, I should identify environmental solutions implemented at each stage. If possible, I should also suggest further solutions. Team, your assistance is greatly appreciated! Our next focus after examining the mobile phone life cycle will be investigating the carbon cycle.

### Task 4:

The expedition funder sent me a poor-quality partial scan of the carbon cycle. My head is dizzy and I don't remember how I should complete it. Where is my team?

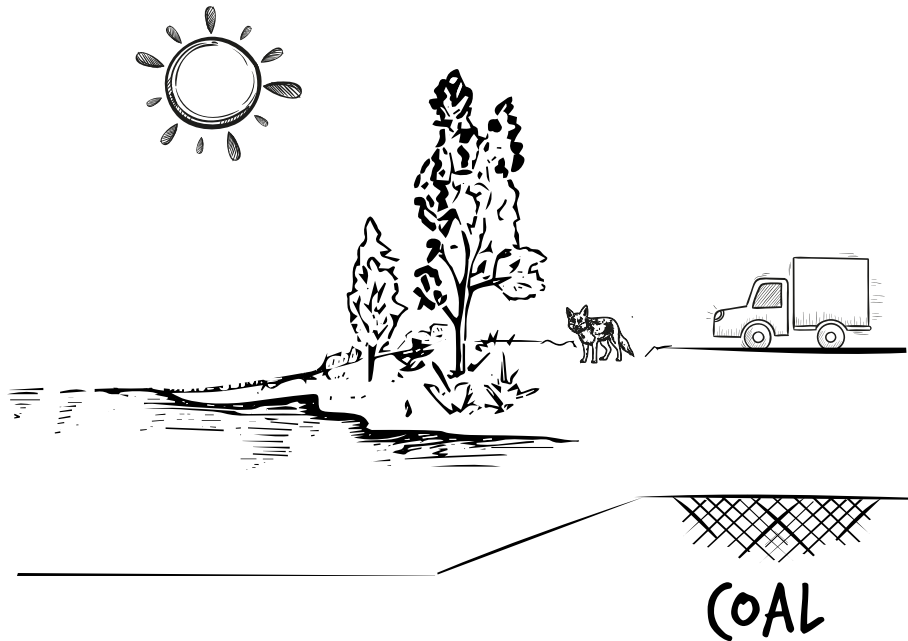
### Task 5 – I must not forget!!!

I need to get a new mobile as I lost mine in Ulaanbaatar somehow. I am still hesitant about whether I should buy a brand-new device or opt for a secondhand one. I ask the student team to list the arguments for and against buying a new or a pre-owned mobile, including environmental and social aspects. Then I'll decide.

#### For extra points:

Discover the possible cause of why the lead expert of the expedition might have experienced temporary memory problems by examining his travel items found in Ulaanbaatar and by deciphering the following anagram:

VIDSONARLONE KEST



## Complex programs

# Dig deep - Round 3.

# 2.11

## DEAR TEAM,

We have reached the final mission! Congratulations! Thanks to your remarkable efforts, the lead expert of the expedition has successfully completed the final report on time. He is now back home and ready to present the expedition's findings and learnings to the nation. Recognizing the invaluable contribution of your teamwork to the expedition's success, he would like to involve you in the presentation of the results. So, how can you be part of the expedition promo show?

The Team has the opportunity to present the most important, relevant, or interesting results and experiences of the expedition to the audience, based on the insights gained from the first two rounds. The choice of material and presentation method is entirely up to you, as long as it is created solely by the Team. Unleash your creativity! You can consider preparing a poster, a cartoon, a video clip or TikTok video, short interviews, or even crafting a poem, song, or slam poetry. The goal is to reach as many people as possible. Remember, you don't need to include all the key information in your material and presentation. Focus on what the team considers relevant and important.

**Let's make this expedition promo show a remarkable display of our collective efforts!**

Best regards,

X.



# Expedition report - Round 1.

## ANSWER SHEET

### Task 1

What short and long-term effects did the 2010 red mud disaster have on the environment and the population? Maximum half a page

### Task 2

- Calculate how much waste is generated to mine gold sufficient for a wedding ring (5g).
- Approximately how many tons of fish died from the cyanide pollution in Baia Mare in 2000, and how many people did not have access to potable water temporarily?
- Where has been gold mining with cyanide banned besides Hungary?

### Task 3

Draw a figure and write next to it what health effects coal smoke has on the human body and the various organs. (If needed, the space can be expanded!)

### Task 4

Summarize briefly why it is not true that the desert is deserted anyway, we can mine lithium there without consequences.

### Task 5

Based on what I have seen in the tantalum mines I have to write a report to domestic news outlets about what I have seen, what I think about the situation and what the problems are. Half page news article.

### Task 6

What chemical element causes the following symptoms of poisoning in adults: hypertension, limb numbness, headache, abdominal pains, mental symptoms, mood swings, loss of memory. Google searching is allowed this time!

### Task 7

Describe briefly how the life circumstances of the local stannum mine workers could be improved on the Indonesian islands.

### Task 8

Calculate how many grams of stannum is used by an average family during a generation (30 years) in a household. Based on my stannum file, the average stannum content in our gadgets (tablet, mobile, similar gadgets) is the following: 2 g, laptop: 3 g, flat screen television: 5. g, Car: 15 g.

	Number of items	Total grams stannum
Tablet, mobile, etc.		
Laptop		
TV		
Car		
<b>Total</b>		

### Task 9

Collect where the mined chemical elements examined by our research group are used in everyday life. I listed the areas of use yesterday, I only have to connect the appropriate chemicals to them, however the Mongolian dust storm flustered my notes :( .

#### Elements

Lithium  
Tin  
Lead  
Copper  
Tantalum  
Gold  
Carbon  
Aluminum

#### Usage area

TV, Laptop  
Packaging can  
Baby toys  
Graphite pencil  
Electronic cable wires  
Printing  
Jewellery, coins  
Medicines, cosmetics  
Battery  
Bowls  
Paint (from the '70s)  
Car  
Bronze statue  
Tin  
Mobile Phone

# Expedition report - Round 1.

### Task 10

I have to list cases, when the mine is funded by banks from European taxpayer money, although there are concerns about the operations of the mine. Here during our expedition there are 3 such mines, I have to write their names and the funding banks here.

### Task 11

I should write a good definition for "raw material curse". Then, based on all the mining cases explored during our expedition I have to summarize the main (positive and negative) economic, social and environmental impacts of mines in a table. Only those affecting the lives of locals and those in the neighborhood! The impact which occurs in at least 2 places must be underlined. The number of cells can be increased as you wish, new rows can be added to the table.

ECONOMIC IMPACTS	SOCIAL IMPACTS	ENVIRONMENTAL IMPACTS

### + FOR EXTRA POINTS

Based on the solution of the anagram, the Hungarian researcher is at present at this location:

# Expedition report - Round 2.

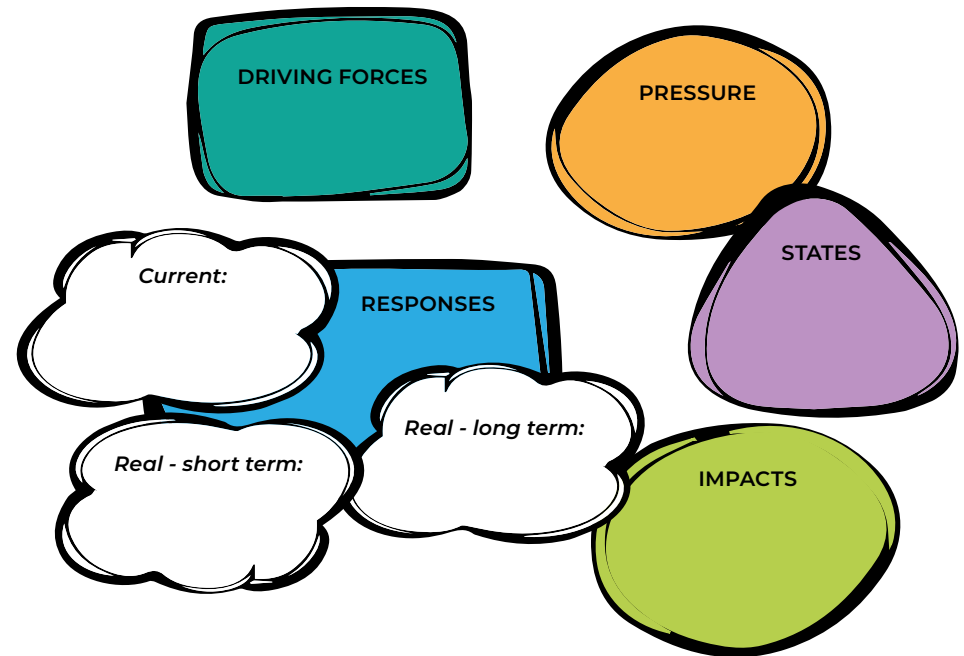
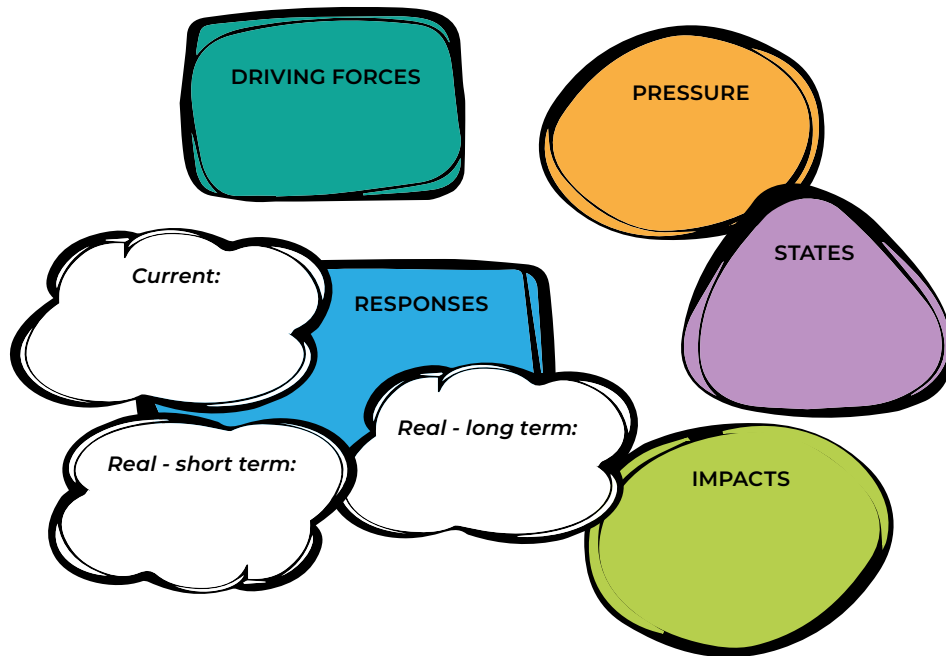
## Task 1 - My tasks for the cause-effect graph

**1. a).** Filling in the missing parts in the cause-effect graph concerning the Rosia Montana + drawing the arrows (the answer text can be written in the bubbles)

This file may help: [Attachments\\_Rosia Montana file](#)

**1. b).** With relevance to stannum mining on the islands of Bangka and Belitung, filling in the missing parts in the cause-effect graph (arrows+ texts). In a round several answers can be given.

Fortunately this file is still available: [Attachments\\_Tin file](#)



## Complex programs

# Expedition report - Round 2.

# 2.12

### Task 2

What happens to the e-waste coming from mobile phones and similar devices? Maximum half a page, as an article.

### Task 3

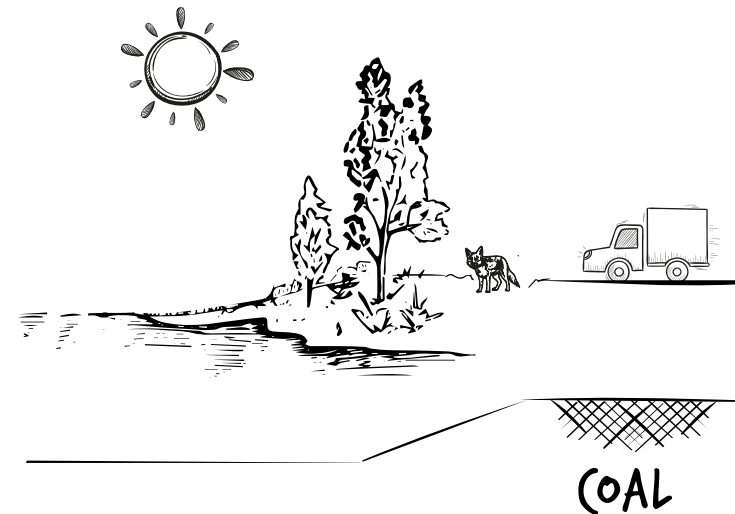
I have to provide the figure below with explanations about what stages a mobile phone goes through during its life cycle (from the mining of raw materials until their recycling and/or disposal), and what solutions there are at the various stages at present to make the product more environmentally friendly. In addition I also have to propose further solutions, where I can. The lines can be extended here as well!



	Name of the stage	Present solutions to make the product more environmentally friendly	Further proposed solutions
1			
2			
3			
4			
5			
6			

### Task 4

The contractor sent me the following carbon cycle figure by fax, I have to complete it with the missing elements, text, arrows.



### Task 5

Describe briefly that based on what you have heard so far, what are the pros and cons of buying a used mobile phone.

### Task 6 - For extra points:

What might have happened to the lead expert of the expedition that leads to temporary memory problems? Find it out based on his travel stuff found in Ulaanbaatar and on this anagram:

VIDSONAR LONE KEST



Climate Education  
EduQuest Yourself!

# Attachments

# Content

0.0

<b>1.1</b>	<b>Attachment - Outdoor games</b>	<b>49</b>
<b>1.2</b>	<b>Attachment - Question-Answers</b>	<b>56</b>
<b>1.3</b>	<b>Attachment - Quiz</b>	<b>90</b>
<b>1.4</b>	<b>Attachment - Situation games</b>	<b>105</b>
<b>1.5</b>	<b>Attachment - Ecomatic</b>	<b>111</b>
<b>2.</b>	<b>Attachment - Complex programs introduction</b>	
<b>2.1</b>	<b>Attachment - Carbon snake</b>	<b>121</b>
<b>2.2</b>	<b>Attachment - Dinner from 0 km</b>	<b>125</b>
<b>2.3</b>	<b>Attachment - Ecological footprint</b>	<b>126</b>
<b>2.4</b>	<b>Attachment - Fair trade products</b>	<b>135</b>
<b>2.5</b>	<b>Attachment - Household appliances in the past</b>	<b>138</b>
<b>2.6</b>	<b>Attachment - Renaissance of the season</b>	<b>139</b>
<b>2.10</b>	<b>Attachment - Exhibition Electronical devices</b>	<b>141</b>
<b>2.11</b>	<b>Attachment - Dig deep contest</b>	<b>150</b>
	<b>Dig Deep background material</b>	<b>157</b>



# Attachment - Simple Games - Outdoor Games

## Nature based games

1.1

### WALKING WITH MIRROR IN HAND

- Arising interest
- Biodiversity

A small hand mirror can change our view of the world :-). The participants stand in a queue putting one of their hands onto the shoulder of the person in front of them. The leader gives them a hand mirror to the other hand. They have to hold it in the other hand, putting it onto their nose facing up, watching the world above them: sky, trees, birds, anything (except for the sun). The first of the queue should be the leader of the game, without holding a mirror - he/she watches the road and takes care of the group's safety. The others can observe the trees etc. along the way.

### SOIL LADDER

(See also as Biomimicry, Principle 4 - Nature recycles everything)

- Raising interest

The game focuses on the examination of soil layers. It helps participants to observe how nature recycles everything.

Divide the students into groups of 4–5. Ask each group to create a 'ladder' on the ground from sticks as below, with each square 40–50 cm wide.



Ask each group to observe the steps of humus formation. Investigate the animals living in the different levels (it is good if you have a simple identification key) and the different sizes of soil particles.

Before carrying out the activity, ensure you are in a place where no rare or protected species can be found. After completing the activity, ensure all soil and vegetation is replaced as you found it.

**Option a:** After marking the squares, follow the instructions below.

1. Leave untouched.
2. Remove whole, not decaying, leaves, needles, sticks, herbaceous plants.
3. See 2 and also remove decaying leaves, needles, which can be still identified.
4. See 3 and also remove humus (dark layer with organic materials in it) down to mineral soil level (no organic ingredients).

**Option b:** Using a small spade, students take samples from each square at different depths as follows:

1. Collect a sample of vegetation from the surface.
2. Take a sample of soil/decaying vegetation from 5 cm depth.
3. Take a sample of soil from 10 cm depth.
4. Take a sample of soil from 15 cm depth.

### DEER GAME

(See also as Biomimicry, Principle 8 - Nature seeks balance)

- Focusing interest

Animals have four essential needs for survival: food, water, shelter and space. This game models the balance between these elements.

Divide students into two groups: one group will be the deer, the other the conditions in nature which the deer need. Each of the four needs is represented by:

- hungry deer/food: hands on stomach;
- thirsty deer/water: hands at mouth;
- deer looking for shelter/shelter: hands form roof above head;
- running deer (needs space)/space: arms spread out wide.

The two groups line up in rows 15–20 m apart facing backwards (no looking). The deer choose what they need (making the correct sign), as do the students playing the conditions (needs) for survival.

## Attachment - Simple Games - Outdoor Games

# Nature based games

# 1.1

When instructed, both groups turn around to face each other. They are not allowed to change their signs. The conditions (needs) stay where they are whilst the deer run to grab a condition matching the need they have selected, bringing it back with them. When two deer run for the same need, the fastest wins, the slower dies. Any deer who have not found their need die and become the conditions (needs) in the next round together with any unclaimed needs. Play at least 5 rounds, preferably 10, writing down the number of deer and conditions (needs) at the start of each round.

Observe how the number of deer changes and what caused the change. You can plot the number of deer and needs in each round on a graph to clearly observe the relationship. Discuss with students how the numbers of deer were regulated by the conditions (needs).

### MEETING A TREE

- Direct experience

Divide the participants into pairs. One member of each pair should be blindfolded. The other leads him/her to a tree. The blindfolded try to gather as much information as possible from the tree without using the vision. After it the partner leads him/her back to the original place (can be led on “detours”), the blindfold can be taken off and he/she should find the tree.

Very good game for discovering that all trees are unique.

### ANIMAL BODY PARTS

- Direct experience

Divide the participants into 4-5 persons. They have to choose an animal and figure out how they can act this animal together - each person should be a body part of the animal. They can practice a bit, then they play to the others, who should figure out what animal they try to act.

### PALETTE OF COLOURS

- Direct experience

We need a card with two-folded tape on it. Give these cards to the participants and the task is to gather colors from nature. They should put only tiny pieces onto the tape, but it should be fully covered (otherwise it will stick anywhere else).

The participants may gather only hues of green or brown, or all the colors they find - it can be varied. Also good for comparing different habitats - e.g. meadow, forest, waterside.

### ECOSYSTEM NET

**(See also as Biomimicry, Principle 5 - Nature rewards cooperation and Principle 6 - Nature banks on diversity) 10**

- Direct experience

Make cards with elements, organisms of an ecosystem. (The same cards can be used as in “Who am I” game: the participants find out the cards, put them into the front and continue with this game.)

Give one card to each student, asking them to clip it onto their clothing. Form participants into a circle. They will form the living community of an ecosystem and the inorganic surroundings. The first participant holds the string and searches for someone who he/she is connected to in any way (food, shelter etc.). The first person keeps the end of the string in one hand and gives the ball to the second one. The next does the same, looks for someone with a connection, holds the string and gives the ball to the next connection. Continue until everybody holds the string and are connected.

Talk about the role of this web of connections and each element within it. What will happen if we withdraw one or two organisms? Are some elements more important than others? How many elements can be removed without losing the sustainability of the habitat? If we play with an “artificial” ecosystem, with only a few organisms, the weaknesses can be noticed easily.

# Attachment - Simple Games - Outdoor Games

## Nature based games

1.1

### NATIONAL PARK OF ANTS

- Direct experience

Divide the participants into 3-4 person groups. Each group gets an approx. 1m long string. The task is to find a place for the rope, which can be the road in the "National Park of Ants". This means that along the road they should show some interesting species of plants or other interesting things for the ant "visitors". After placing the string somewhere, the groups show the national park roads to each other.

Aim of the game is trying to see the world with the eye of a tiny animal.

### FOX HUNTING

- Sensory awareness

We are standing in a circle. We choose one person to sit in the middle of the circle blindfolded! Cover the area between the circle and the person sitting inside with leaves and twigs. The person in the middle is given a cymbal to put down in front of her/him and a spray bottle with water to hold on. The referee has to choose three people from the circle at a time to steal the cymbal without being heard or noticed by the person sitting in the middle of the circle. No running is allowed! The person sitting in the middle of the circle can use the spray bottle as a 'weapon' to shoot those who want to take the cymbal. If a person is hit she/he must return to the circle. The person in the middle has 8 shots in total. When the guardian shoots everyone, the referee chooses a new guardian. The cymbal theft is successful if the 'fox', i.e. the person who has left the circle, returns to the circle with the cymbal and without having been shot.

The game involves a special walk. This is called the fox walk. The idea is that the fox walks with its heel first and then gradually its whole foot touching the ground, so that it can move without making any noise, which is a great help when hunting in the forest. This gait allows the 'fox' to approach the guardian in a circle of twigs and leaves and steal the cymbal from the guardian.

Aim of the game is getting to know how to rely on other senses (ears, skiing,

nose, etc.) then just eyes. The mimicking of the fox helps to understand the nature of this animal.

### BINGO

- Getting to know each other

We create a 3x3 table. Each rubric has a statement. Everybody gets a paper with the table. They have to go around and find someone whom the statements can be true and have them sign the statement. A person can only sign one statement in the table. The statements can be changed regarding the topic.

Aim of the game is to ease the mood of the participants and try to find common ground between them.

WHEN SHOPPING I TRY TO CHOOSE HUNGARIAN PRODUCTS, EITHER FOOD OR CLOTHES.	I HAVE BEEN DISCRIMINATED AGAINST BECAUSE OF MY GENDER.	I COMPOST.
I COLLECT WASTE SEPARATELY.	IF I CAN, I SAY NO TO PACKAGING AND PACKAGED PRODUCTS.	I THINK IT'S IMPORTANT THAT WHEN ANOTHER PERSON IS CRITICISED, THEY SHOULD BE TREATED FAIRLY, SO WE HAVE TO TAKE INTO ACCOUNT THE CIRCUMSTANCES OF THE PERSON AND THE SITUATION.
I'M TRYING TO EAT LESS MEAT.	I HAVE HAD MY CURRENT PHONE FOR AT LEAST TWO YEARS.	I'VE SHOPPED SECOND-HAND CLOTHES.

# Attachment - Simple Games - Outdoor Games

## Nature based games

1.1

### MINESWEEPER

- Sharing experience and information

There is an 8x8 minefield in front of the team. The task will be to get through it as a team. They can cross on one safe path, and everybody has three lives. Regular steps are: forward, right, left one by one (not diagonally!) They can feel free to try, but they have to find the right way together and all of them have to get across so none of them can lose all their lives. Each step with grey colour holds a grenade and a question or a task. If they answer the question correctly or solve the task together, they can keep their lives.

#### Examples:

- **Question**

Which animals are particularly at risk from palm oil extraction?

- A. Common macaque, Sumatran porcupine, Javan leopard
- B. Sumatran rhinoceros, Orangutan, Sumatran tiger
- C. Indochinese black langur, Asiatic lion, Indian giant squirrel

- **Task**

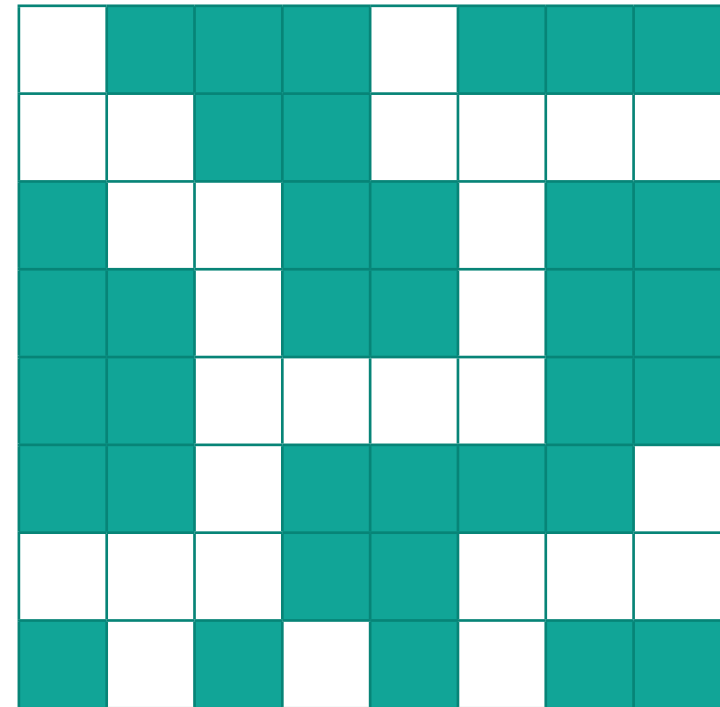
Grab a pencil and lay out a plan of how to reduce your carbon footprint and present it to the referee. Only your imagination and creativity can hold you back! Good luck!

### FOLLOWING TRACKS

- Observation, learning, data collection

Animals in the area are not always visible, but there are many signs and clues to their presence.

Let's discuss what these might be: footprints, dwelling places, dead remains (antlers, hair, feathers, etc.), eating tracks, droppings, sounds, smells, etc. Briefly present the collection available and have everyone look at which items refer to



which animal. For footprints, point out the differences in size and the way they walk.

When out on a hike, look for an area with a wide variety of habitats (e.g., forest edge, stream bank, lakeshore). Divide the group into small groups of 3-5 and spend about 10-15 minutes collecting as many animal signs as you can. If something is controversial, discuss it or look it up.

Aim of the game is getting to know how to rely on other senses (ears, skiing, nose, etc.) then just eyes. The mimicking of the fox helps to understand the nature of this animal.

# Icebreakers

### WHO AM I? (Guessing game with animal/plant names)

- Getting to know each other

The leader of the game puts a card with a picture or name of an animal or a plant on the back of each participant (e.g., with a clip). The task is to figure out what animal is on one's back by asking questions from the others. The questions must be decidable, so the answer can be "yes" or "no". The participants already figured out their organism and can put the card to the front.

### NOAH'S ARK

- Getting to know each other
- Arising interest

Prepare cards with animal names - 2-2 with the same name and give it to the participants (they shouldn't show the card to each other). For a given sign (e.g., clap), the pairs must look for each other by mimicking the moving and sound of the animal on their card.

### LYNX AND RABBITS

- Focusing interest

Best place for this game is a forest with hiding places. Choose one participant for being a lynx, the others will be rabbits. The game catches the moment when the lynx notices its prey and starts chasing it. First the "lynx" closes his/her eyes and the leader of the game counts till 20; the "rabbits" try to hide during this time (within eye-reach distance). Then the "lynx" opens his/her eyes. It is allowed for him/her to move only 1 step to either direction. When he/she notices anyone, the leader of the game goes for the "rabbit" (not the "lynx"! ). When he/she doesn't see more participants, closes the eyes again, the leader counts till 10 or 15 and the "rabbits" come closer. It can be repeated once again. The winner is the closest "rabbit" not being noticed - or the "lynx" if he/she could notice everyone. The aim of the game: the participants can sense the importance of hiding colours and usually they observe their surroundings carefully, by sitting alone and quiet in one place...

### ARTWORK FROM NATURAL MATERIALS

- closing/sharing experience

Choose a place in nature with various materials around (gravels, leaf-litter, fruits, seeds, bird feather etc.). The participants can work alone, in pairs or in small groups. The task is to make an "artwork" from natural materials. The topic can be different depending on the group, age, previous topic of the day: can be a piece of the landscape, the biggest experience of the day, a scene of a fairy tale, a verse.

Good if we show a certain place to the groups and a time limit. At the end the groups present their work to the other.

### KIM GAME

- Arising interest
- Training memory

Choose a place in nature with various materials around (gravels, leaf-litter, fruits, seeds, bird feather etc.). Have a tray or a big A3 paper with you and collect 10-15 items from nature and place them on the tray. Cover them with a cloth. Divide the participants into 3-4 person groups. Make the groups sit around and give them 1 minute to look at the uncovered tray. Then each of them has to collect the same pieces from their surroundings and place them on their tray or paper in the same place.

Aim of the game is the development of memory and observation skills and can be used for learning new groups of objects such as shapes of leaves, etc.

### SPOT GAME

- Direct experience

Choose a place in nature with a lot of hiding places (trees, stones, bushes). Choose one person from the group to be the counter, from whom the others scatter 80-100 metres in one direction. The counting person cannot move from his pla-

# Icebreakers

ce, he can only take one step in a circular direction, but one foot must always remain in its original place. The aim of the game is for the scattered people to try to sneak as close as possible without being seen by the counter. The counter will always count to 15 with his eyes closed, at which point there is a chance for the scattered people to move and hide when the counter is finished. No running is allowed! Anyone who is spotted by the counter must call out their name and the person who heard their name must come forward and stand back beside the counter. The game continues until the referee says it is over or if there is only one person who hasn't been called out.

Aim of the game is to release stress and raise awareness to the surroundings. As we hide we get to feel the earth, the tiny habitats around us.

### PHOTOSHOOT

- Perception

Highly effective, memorable game. Players are divided into pairs and one of them closes their eyes. The other has to find a sight in his environment that he thinks will be interesting and memorable for his partner. By leading the player with his eyes closed and adjusting his head to the correct position, he can be „exposed“, e.g., by pulling on his earlobe to indicate that he can open his eyes. After a role reversal, the experience can be processed by drawing a picture of what was seen.

### RELAXATION

- Releasing stress, finding inner voice through listening to nature

Choose a place in nature where the participants could get rid of their shoes and lay down on the ground. Read up the following instructions. Be aware to have a calm, slow but steady voice.

Take off your shoes and socks if you're wearing them. Walk barefoot for a while. At first you will be disturbed by the unfamiliar, the stinging and rough feeling, the bugs.

Close your eyes and walk around with your eyes closed for a while.

If the sun is shining on you, close your eyes and turn to face its light. Feel its warmth, its energy. If there is no sun, look at the sky, the clouds. How huge and how small they seem!

Open up and listen to nature. How many different sources of sound do you recognise?

Look down at the ground. How many forms of life can you see?

Scatter the undergrowth or get as close to the ground as possible. Can you always see them?

Look around and smell as many things as you can. Smell their scent. A handful of soil, the plants or even the trunks of the trees, the fruits, the air.

The smells of nature are not like ours. They are not harsh. They don't want to overpower the other. They create harmony.

Look up a tall tree. See it all. Feel what you can't see - the roots of a tree that is once again as tall, as deep underground as the tree itself. Think of the immense energy that is inside. It was just a small seed and now how big, how huge! The sun, the water, the earth made it so. And the life that's in it. Can you, will you, harness life like this?

Lay down on the ground! Make yourself comfortable - put your legs in a slight spread, arms relaxed by your torso.

Listen to your breathing - try to deepen it and control it. Inhale and breathe in calmness and energy - exhale and allow this calmness and energy to flow throughout your being.

Pay attention only to your breathing, which should be soft and even. Open your ears to the sounds of nature - the chirping of birds or even the rustling of trees and let it take away all your worries.

## Attachment - Simple Games - Outdoor Games

# Icebreakers

1.1

Let the sun's rays warm your body or a cool breeze caress your skin - feel it energize you and bring love and care with its soft caress.

Focus your attention on your feet and without moving: relax your feet, your calves, your thighs - Feel your whole foot become lighter.

Relax your lungs and heart. Breathe in the lightness, and on the exhale, allow this lightness to flow through your body with the rhythmic beat of your heart.

Notice your posture and relax your back, waist, and neck. Feel a pleasant tingling sensation go through your spine.

Then relax your shoulders, upper arms, forearms and finally the back of your hands. Feel your arms getting warmer.

Now touch your palm to the ground and feel the powerful energy it radiates.

Relax your neck. Can you feel your throat relaxing?

Focus your attention on your head. Allow your forehead, eyebrows, lips, and every muscle in your face to relax. Feel yourself getting smoother.

Your body becomes relaxed and light. You are calm and peaceful. Let go of your thoughts and daily self-identifications. Feel yourself going on and on without them. Experience that you are not identical with your body or your mind. Feel that you are one soul.

Take a rest. Recharge and spend time in this atmosphere.

Slowly return to your physical body.

Redirect your attention to the outside world. Feel the ground beneath your body, the clothes on your skin. Listen to the sounds around you so you become aware again of the forest you are in.

Awaken your body - slowly move your toes, your feet. Then gently move your toes, the backs of your hands. Give a big stretch, then slowly sit up in a cross-legged position.

***Thank you for your time!***

# A game of questions and answers

**Topic: CLIMATE CHANGE**

**GREENHOUSE GASSES**

1. If we have too many, we also contribute to climate change.
2. We play a key role in warming the atmosphere.
3. One of our strongest soldiers is water vapor.
4. Many international organizations focus on us, including the Intergovernmental Panel on Climate Change (IPCC).
5. The Paris Climate Agreement is about reducing our emissions.
6. Our concentration has drastically increased since the industrial revolution.
7. Carbon dioxide and methane are also our members.
8. We increase thanks to burning fossil fuels.
9. The concentration of one of our members, nitrous oxide, has increased thanks to heavy traffic and to more people using ammonia-based fertilizers.
10. If we were not here, it would be much colder on Earth. We cause problems because of human activities.

**Topic: CLIMATE CHANGE**

**ECOLOGICAL FOOTPRINT**

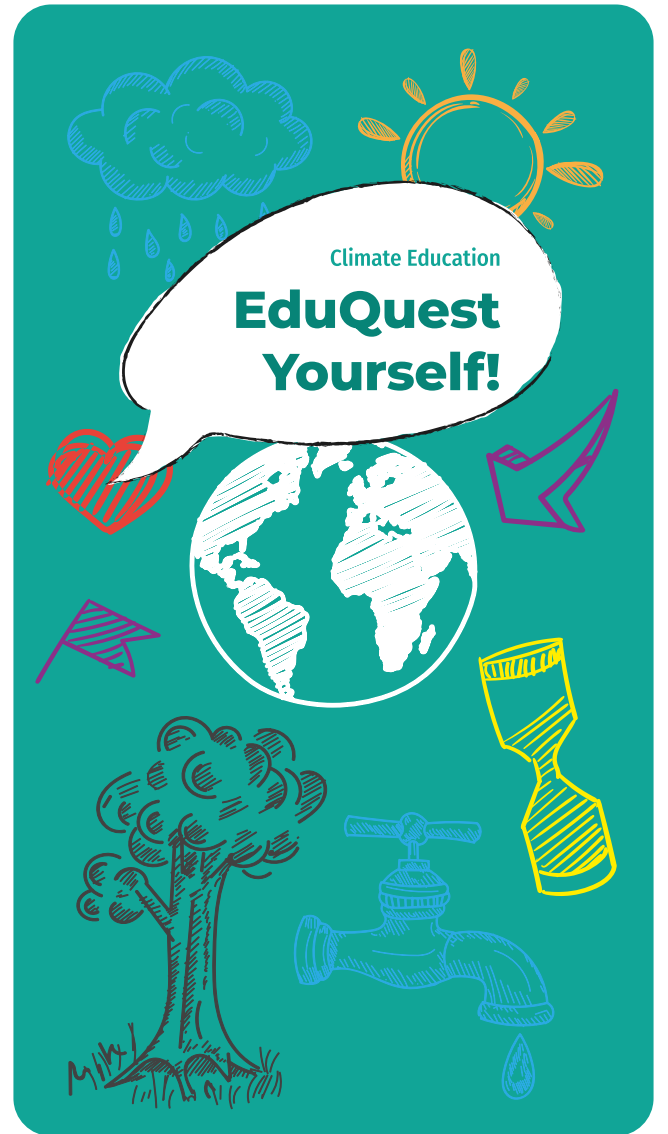
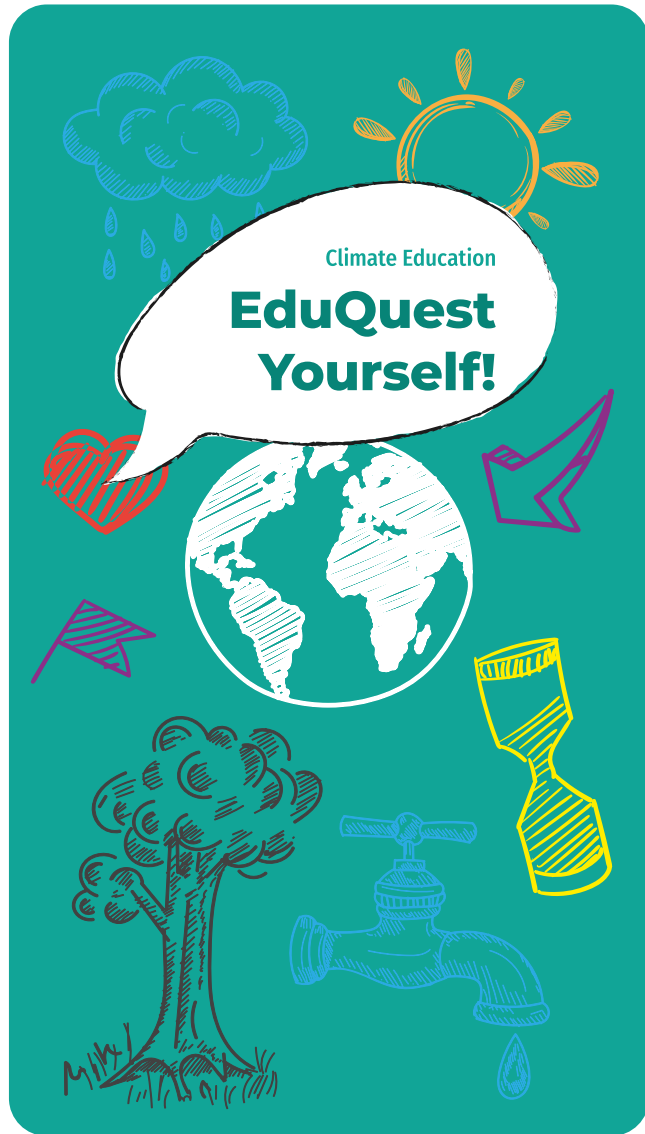
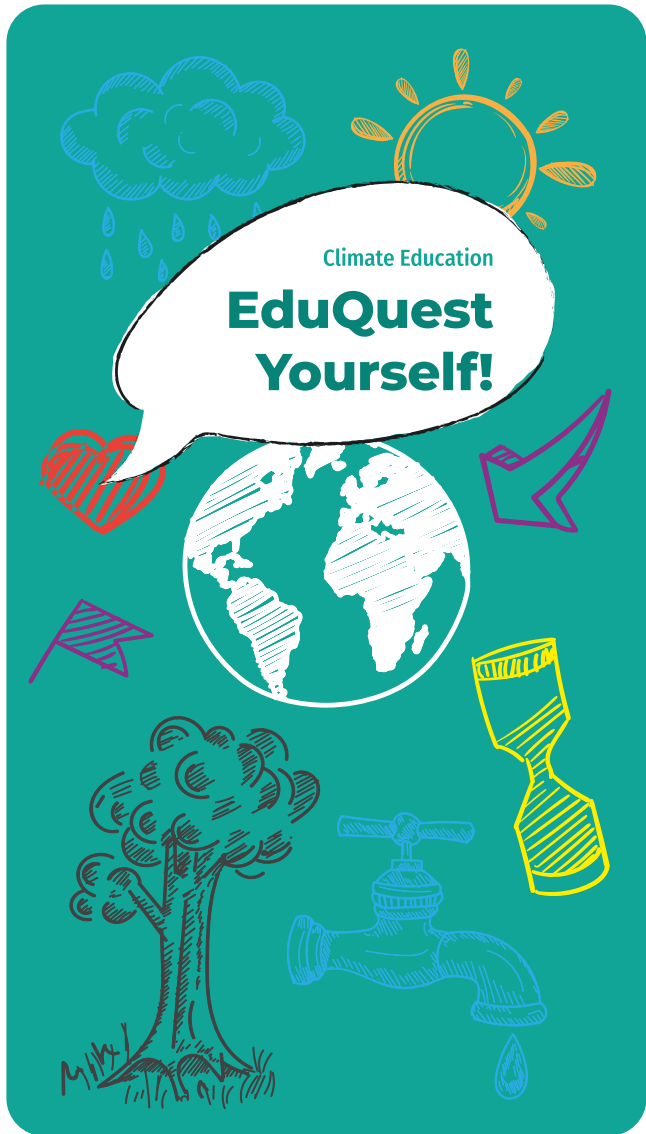
1. I am measured in global hectares.
2. I was created by William Rees and Mathis Wackernagel.
3. I describe how much a person's everyday needs impact the environment.
4. I measure the amount of water and land human society of a certain technological development needs to sustain itself and absorb the generated waste.
5. With my help, you can see that our resources are finite and that most of humanity overconsumes.
6. Currently, I have Kuwait, Qatar, and the United Arab Emirates in my top list (2022).
7. I am three times bigger in the United States than in Hungary, if you measure me for an average person.
8. I showcase that currently, each individual has two hectares to fulfill their needs (heating, housing, meals, etc.).
9. I am calculated by taking fossil fuels, pastures, forestry, fishing, agricultural areas, and built-up lands into account.
10. Although I'm a footprint, you cannot see me.

**Topic: CLIMATE CHANGE**

**WATER FOOTPRINT**

1. I show how much water we use, both directly as consumers and indirectly through consumer goods.
2. I track the usage of one of the Earth's most important components.
3. According to my indicator, a sensible water user in a developed country will directly use 124 liters of water each day on average, which can grow to 5000 liters if you consider indirect usage.
4. I show that you need 200l of water to make a single glass of milk.
5. Hungarian agriculture uses 70% of the available water supply, which I can also show.
6. I contain traces of water.
7. The Earth's freshwater resources are in danger not only from excessive consumption and the increasing population, but also from climate change, environmental pollution, soil pollution, economic growth, and changing lifestyles. I can be a good indicator in solving these problems.
8. With my help you can see: If 1 billion consumers each buy two fewer cotton T-shirts per year, then that spares enough water whose cost can feed 4.6 million people for a whole year.
9. I can be measured for any group or company.
10. The USA's citizens use up to 2.48 million liters of water each year, which is double the global average and more than triple the Hungarian average. I told you so!





# A game of questions and answers

**Topic: CLIMATE CHANGE**

**CLIMATE CHANGE**

1. My impact is felt all around the world.
2. I am the result of a dramatic increase in atmospheric concentrations of greenhouse gases.
3. Above the so-called 1.5°C threshold, I can become irreversible.
4. Wildlife is trying to adapt to me, people are trying to control me, but so far without success.
5. I happen because of humanity's increasing consumption and requirement levels.
6. I have been present in the geological past, detected by scientists in plant fossils and ice cores.
7. One of main proofs of my existence is the changing seasons and the retreat of glaciers.
8. I am capricious. Sometimes I cause frequent droughts and desertification, other times I wreak havoc with extreme cold, flash floods or hail at any time of the year.
9. I am greatly influenced by the burning of fossil fuels, deforestation, land use and intensive livestock farming.
10. I cause a long-term (hundreds of years) and substantial change in climate that can be locally proven.

**Topic: CLIMATE CHANGE**

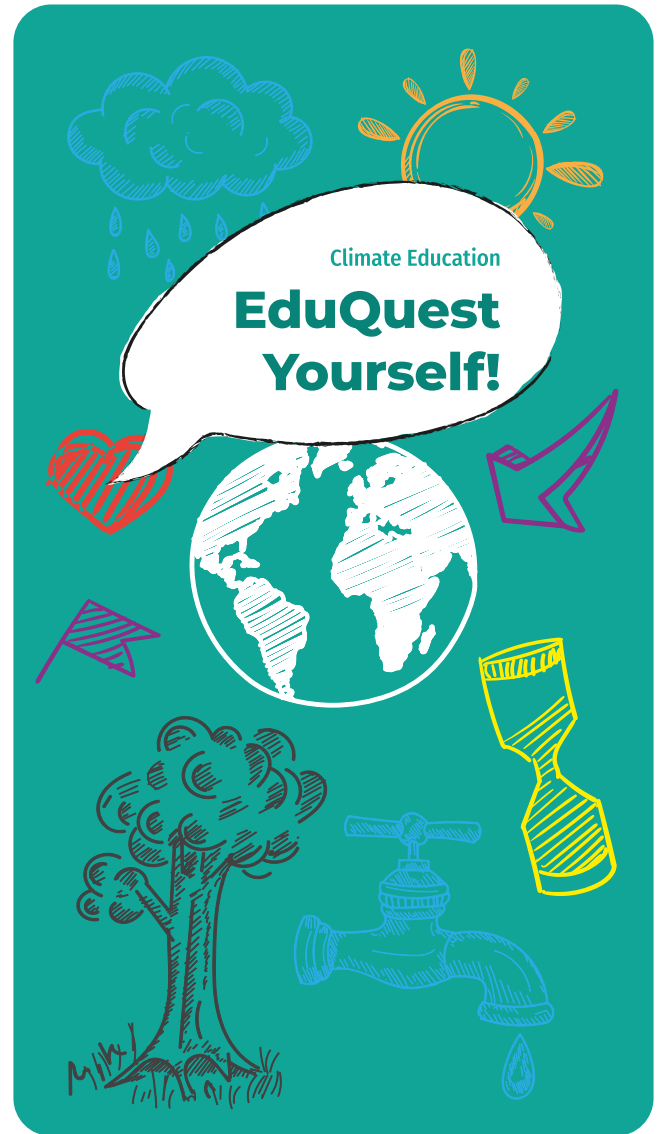
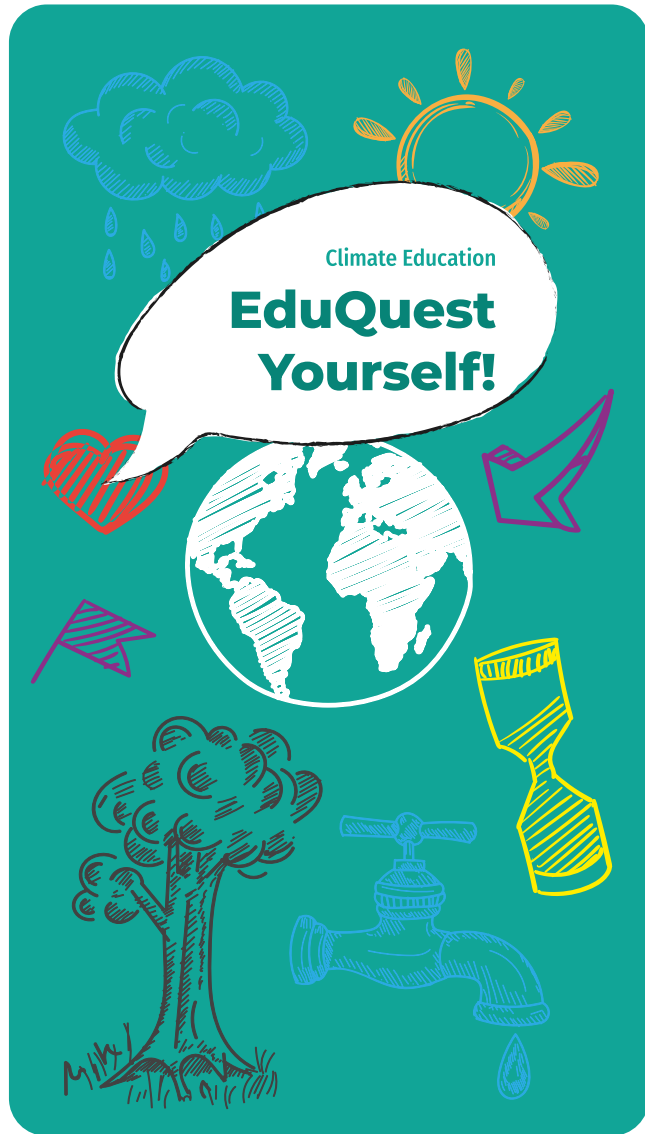
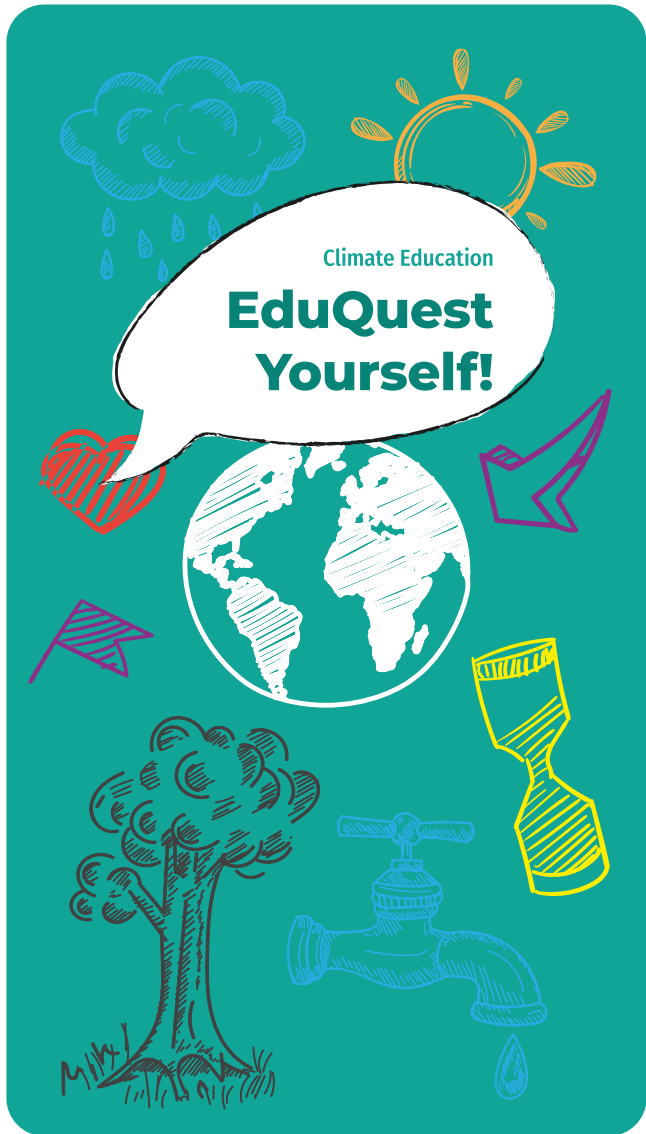
**ENVIRONMENTAL PROTECTION**

1. Many green NGOs (non-governmental organizations) focus on me. One such NGO is the Magyar Természetvédők Szövetsége.
2. I offer solutions to many problems, but I also focus on preventing environmental problems.
3. I differ from wildlife conservation in that I deal with humans and human-built environments as well.
4. I am an ideology, philosophy, and movement all in one.
5. Unfortunately, the legislation that deals with me is often not properly enforced, e.g. overridden by economic interests.
6. My first official movement was inspired by Rachel Carson's Silent Spring (1962).
7. One of my biggest and most important organizations is Friends of the Earth, which is represented in 74 countries. Many topics may be found on my side, for example, climate change, recycling, energy efficiency, pollution, etc.
8. On an individual level, all people can join me on a larger or smaller scale.
9. I must be talked about in schools. I'm part of elementary school classes, but you may major in me at universities.

**Topic: CLIMATE CHANGE**

**SUSTAINABLE DEVELOPMENT**

1. I'm more than two decades old, but my definitions are still controversial.
2. I want to fulfill basic necessities (the minimum resources that someone needs to stay alive) and not wants.
3. I feel responsible to provide for the basic necessities of future generations.
4. Herman Daly correctly said that I am: achieving continuous social well-being without increasing ecological sustainability beyond repair.
5. Because we're using our resources at an extreme pace, fewer and fewer people have clean drinking water and food available, and their number will only grow if the current generation ignores me.
6. I'm a system of relations that must follow measures dictated by the environment and all of society.
7. I'm not immortal, so societies must adapt to new changes which can only happen if we understand the basics of our systems and act accordingly.
8. You can follow my principles as an individual or as a group as well. For instance, you can buy energy-saving light bulbs and local produce.
9. I'm a stepping stone to achieving human well-being, but that requires changing attitudes.
10. Humanity as a whole has surpassed what the planet can sustain, and further growth is impossible. A reduction is needed, and for that, I am a necessity.



# A game of questions and answers

**Topic: CLIMATE CHANGE**

**EUROPEAN GREEN DEAL**

1. I am the EU's response to the global challenges of climate change and environmental degradation.
2. I want to boost efficient resource use, so I prepared an action plan.
3. I was first presented by the European Commission in December 2019.
4. Ursula von der Leyen stated that I am a new growth strategy that will transform how you're living and working, produce and consume.
5. I cover all sectors of the economy like agriculture, transportation, energy, etc.
6. My aim is that Europe becomes carbon neutral and reaches net zero by 2050.
7. With the Just Transition Mechanism, I support those regions that heavily rely on carbon.
8. There are 8 areas where I take action: Climate, Energy, Agriculture, Industry, Environment and oceans, Transport, Finance and regional development, Research, and innovation.
9. I will improve your health by providing free air, cleaner water, energy-efficient buildings, soil and biodiversity, longer-lasting products, cleaner energy, and many more.
10. The Fit for 55 legislative package is part of me.

**Topic: CLIMATE CHANGE**

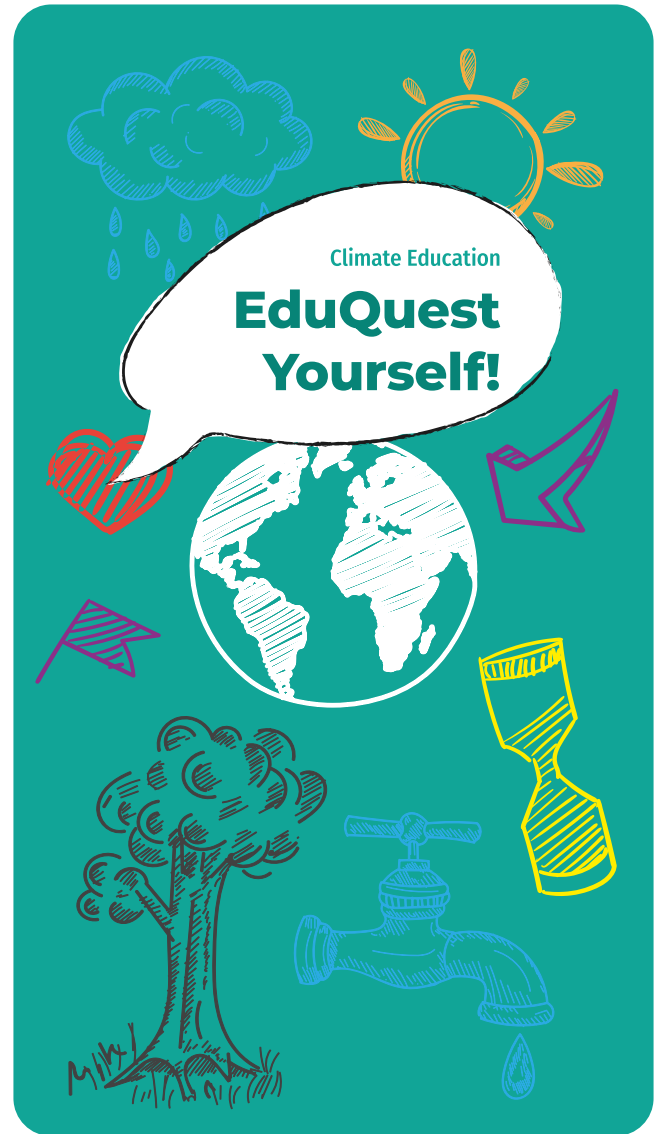
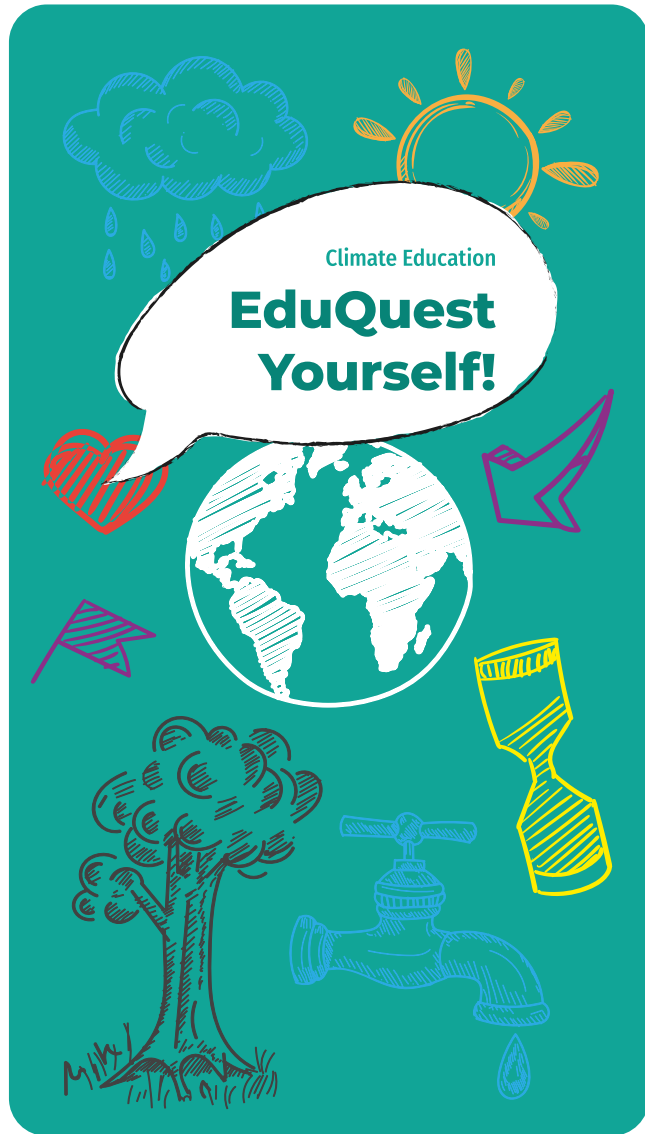
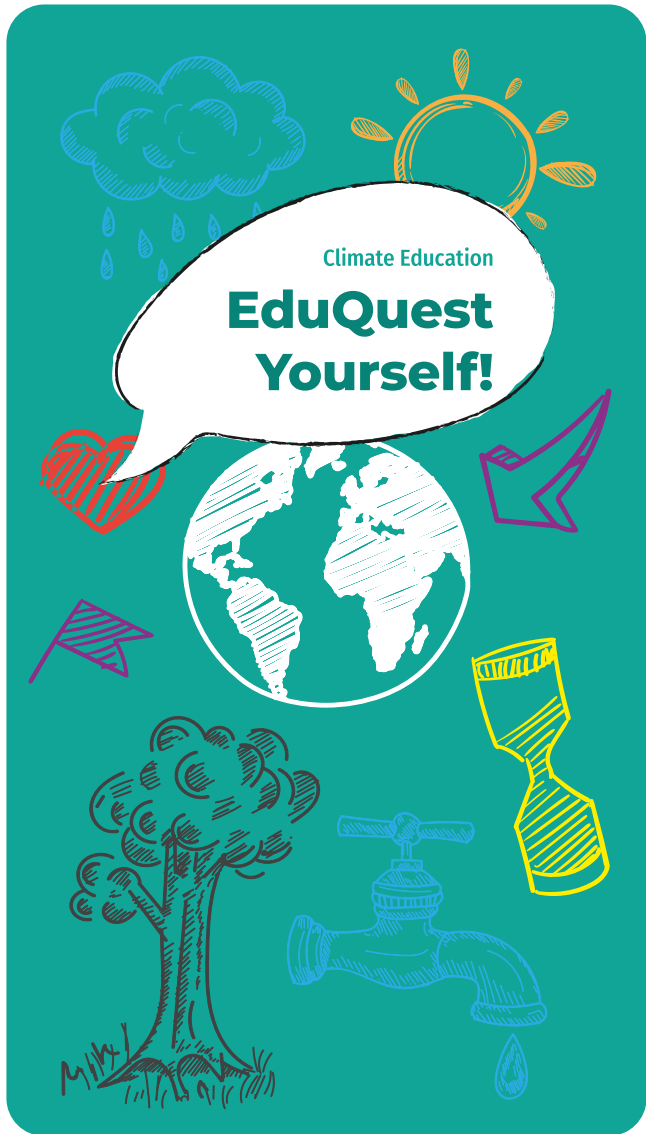
**PARIS CLIMATE AGREEMENT**

1. I am an international treaty on climate change.
2. Thanks to me, from now on every climate change-related proposal tries to keep the increase in global average temperature below 2 °C.
3. I was adopted in 2015.
4. Low greenhouse gas emission is very important to me.
5. Countries who joined me agreed to communicate their climate action plan every five years.
6. Countries had to have nationally determined contributions by 2020.
7. I provide a framework for financial, technical, and capacity-building support to those countries that need it.
8. From 2024 the countries will report on actions they took to fulfill this treaty.
9. I was negotiated at the United Nations Climate Change Conference (UNFCCC) in France.
10. The United States withdrew from me in 2020 and a year later rejoined.

**Topic: CLIMATE CHANGE**

**CLIMATE CHANGE CONFERENCE**

1. Those that signed the UN's Framework Convention on Climate Change meet with me.
2. I meet with developed and developing countries.
3. I visited Paris in 2015.
4. I visited Glasgow in 2021.
5. I'm held annually unless the parties decide otherwise.
6. My goal is international climate protection.
7. I was first held in Berlin in 1995.
8. One of my goals is to reduce greenhouse gas emissions on a global scale.
9. Many try to influence me including industrial lobbyists, civil organizations, and climate experts.
10. In 2015 I helped to create the Paris Climate Agreement.



# A game of questions and answers

## Topic: CLIMATE CHANGE

### RECYCLING

1. My main goal is for fewer trees to be cut down and fewer raw materials to be produced to make things.
2. My logo is three green arrows following one another.
3. One of my goals is for less waste to be created.
4. At the moment, I'm not fully realizable with all products of the world (e.g., lithium batteries), but it's always good to seek new possibilities.
5. I'm the goal of waste separation.
6. I can also reuse plastics destined for waste in other ways.
7. I fight against pollution by reducing the number of landfills.
8. With my help, the environment can be creatively protected, for instance by creating furniture from cardboard.
9. I only work properly and effectively if society's viewpoint shifts and I become a factor even at the designing table.
10. My main principle is that not all garbage is what it seems.

## Topic: CLIMATE CHANGE

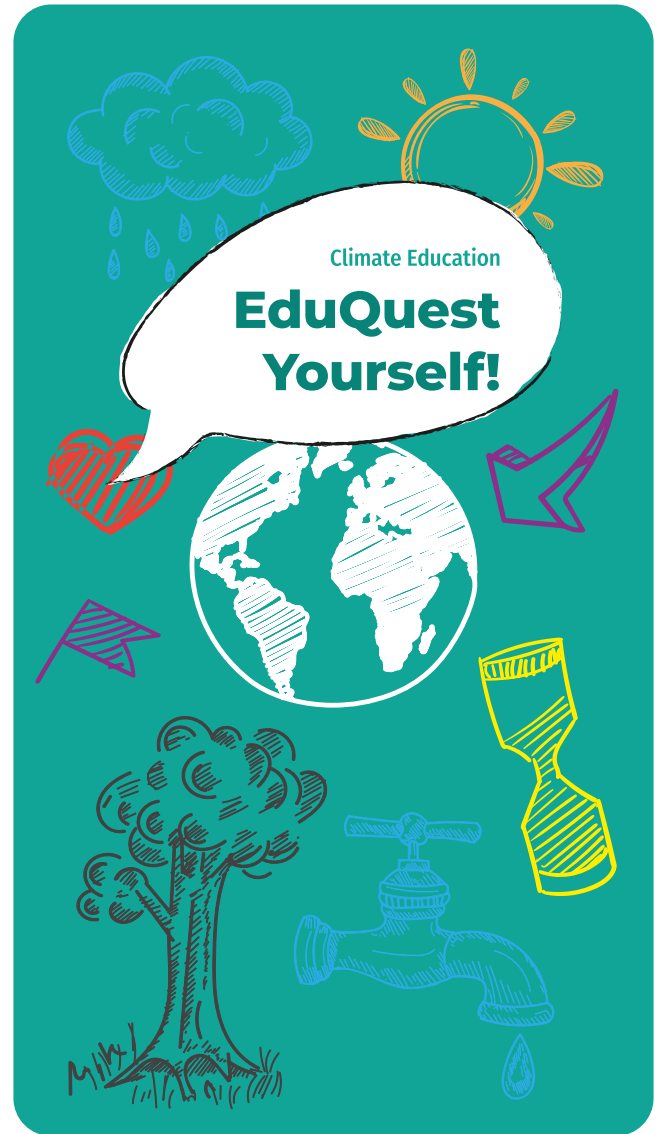
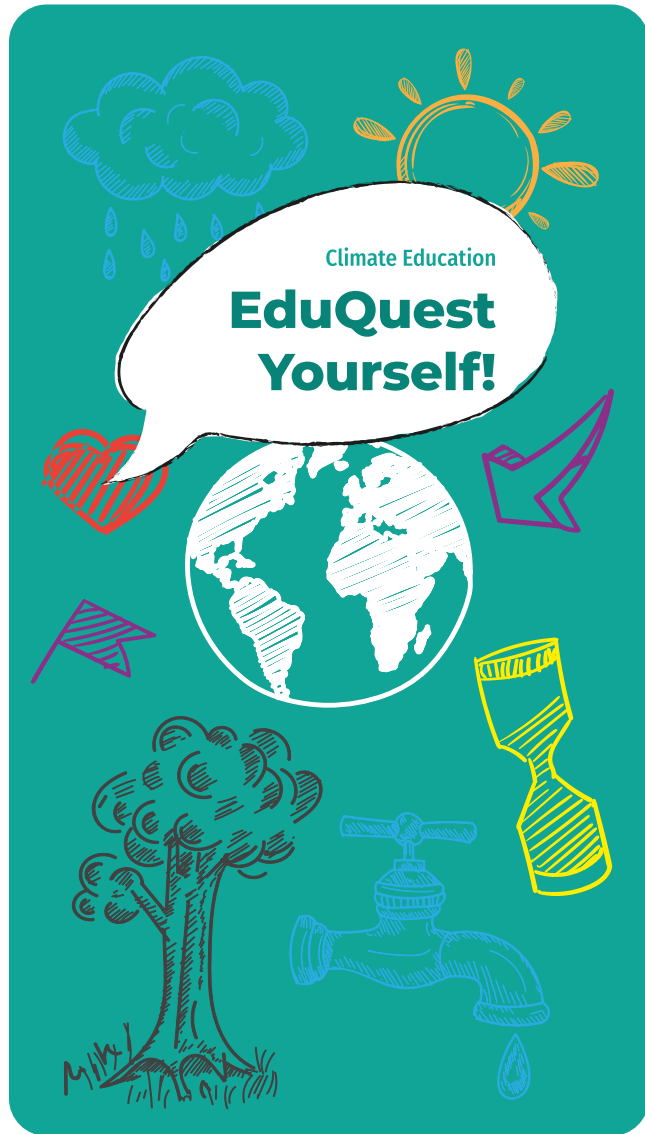
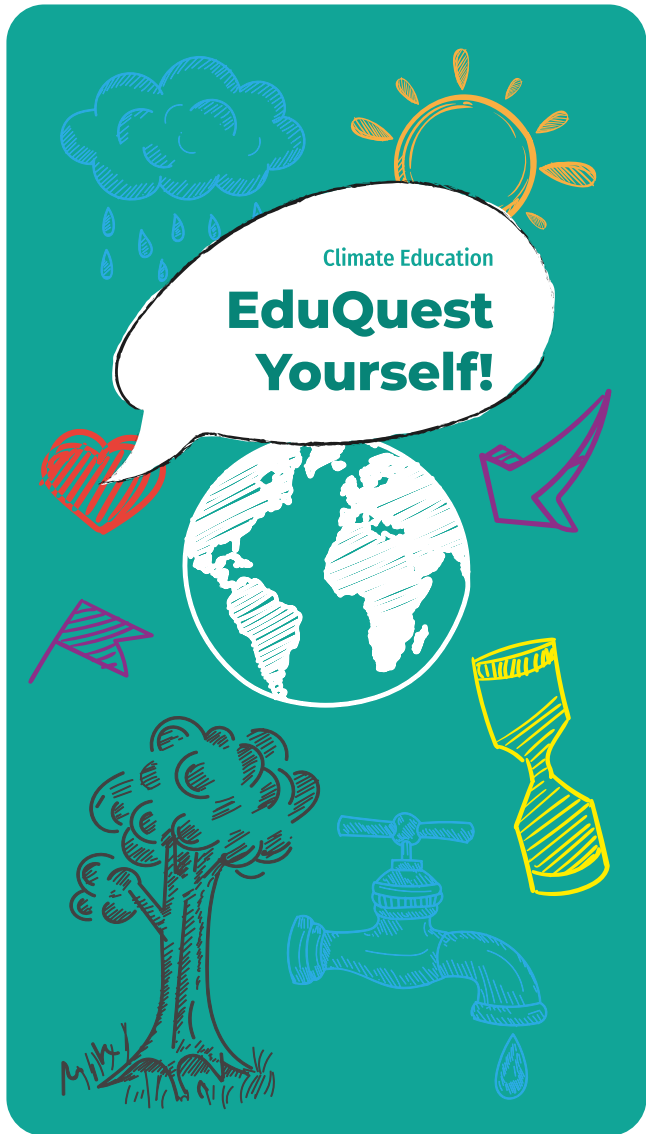
### WASTE SEPARATION

1. I'm defined by collecting waste based on the material they are made of.
2. If you collect household garbage according to type, you make their reuse possible. This is my main principle.
3. I'm a colorful thing with yellow, green, blue, and grey bins.
4. I don't think that paper, plastic, metals, glasses, fabrics, compostable materials, and many other things are garbage.
5. My goal is to limit the massive amount of waste that ends up in landfills, but I'm not as widespread as I should be.
6. I'm not the best solution – that is preventing waste generation in the first place – but I'm a useful and increasingly urgent part of society.
7. Think of me for worn-out batteries, old tyres, expired medicines!
8. You can find information on the internet and physical publications about me and about what kind of waste belongs where.
9. With my help, it's estimated that 20% of the world's garbage can be reused.
10. Although I have collection islands, no water surrounds me.

## Topic: CLIMATE CHANGE

### CIRCULAR ECONOMY

1. My 4 keywords are reuse, reduce, recycle, and remanufacture.
2. I reduce CO<sub>2</sub> emissions.
3. I am designed to use already extracted resources.
4. I try to minimize the generated waste of your life.
5. Some concepts like eco-design, industrial ecology, or industrial symbiosis have contributed to my concept.
6. I am a model of production and consumption.
7. I am against using new resources.
8. I think natural resources should be used more wisely.
9. The Ellen MacArthur Foundation (EMF) is really committed to me and promotes me all over the world.
10. I am the opposite of a linear economy.



# A game of questions and answers

**Topic: CLIMATE CHANGE**

**SOCIAL GAP/SOCIAL DIVIDE**

1. I form when the rich get more and the poor get less money.
2. I'm the type of gap that more and more people fall into.
3. I happen in societies because the main value for people is material wealth.
4. The need for material prosperity grows even after I appear because societal differences deepen me.
5. I can damage the environment because the poor can't, and the rich may not want to live more efficiently.
6. I'm not only defined by income differences but also by unfairness and discrimination.
7. 80% of the world's population lives in countries where there are growing income differences, so I grow too.
8. I'm palpable: In 2006 3.5 billion production making up for 7% of the world's total economic production, belonged to 497 rich people. At the same time, low-income countries of 2.4 billion people only had 3.3% of the world's total economic production.
9. In 2005 the richest 10% of humanity consumed 59%, leaving even less for the poor. This is partly thanks to me.
10. I ruin equality, solidarity, and fairness.

**Topic: CLIMATE CHANGE**

**FAIRTRADE**

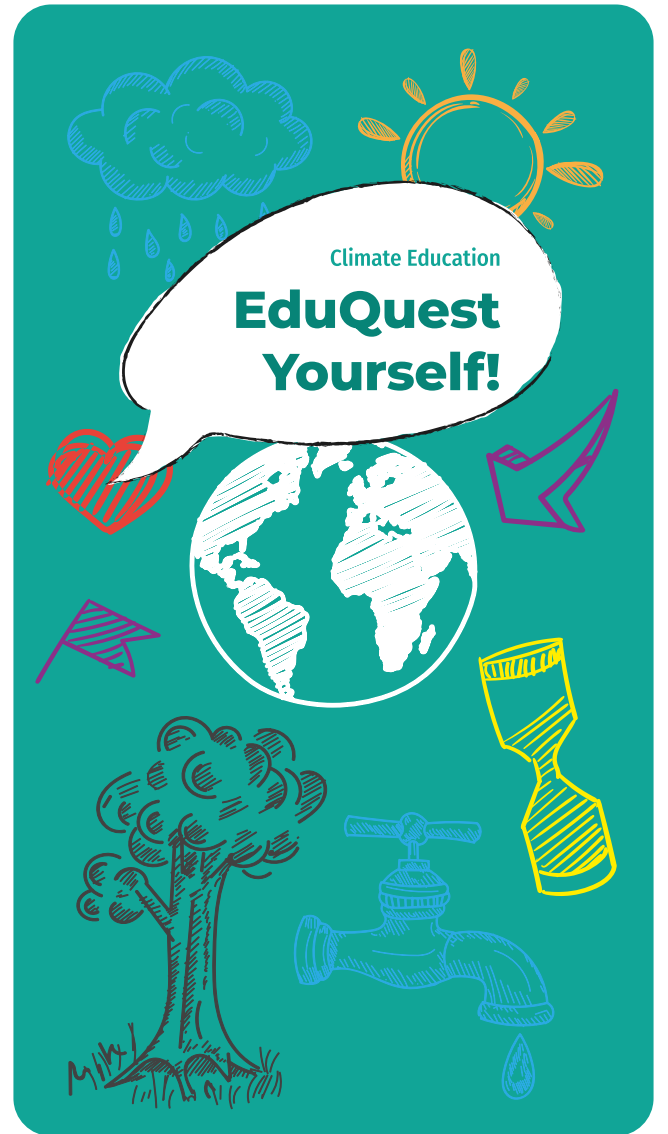
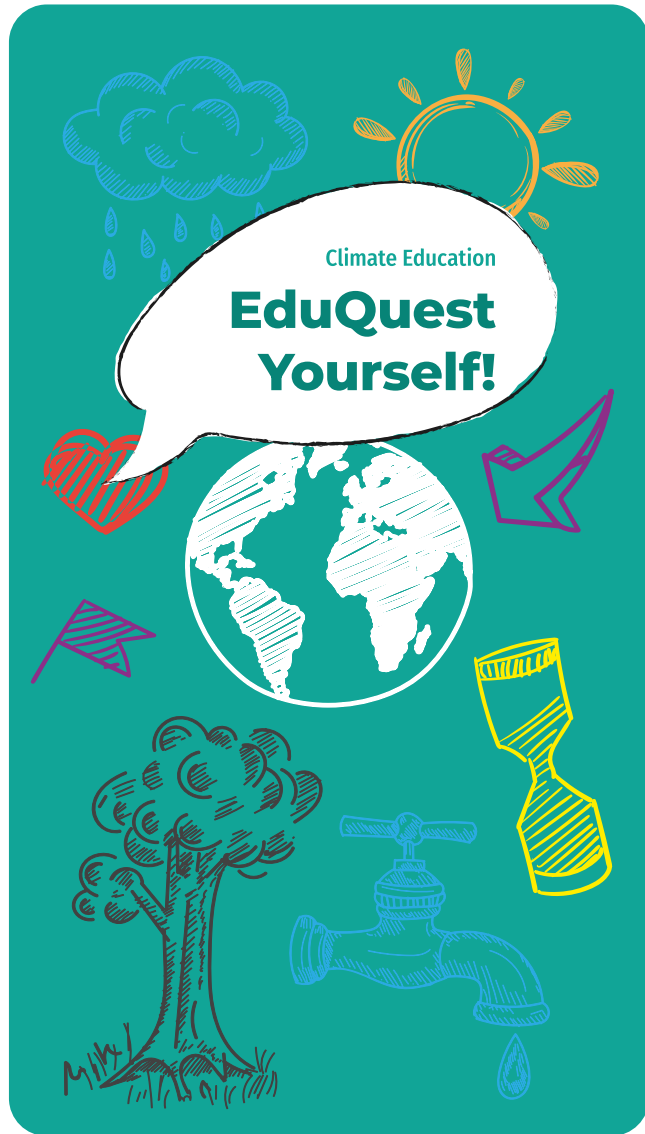
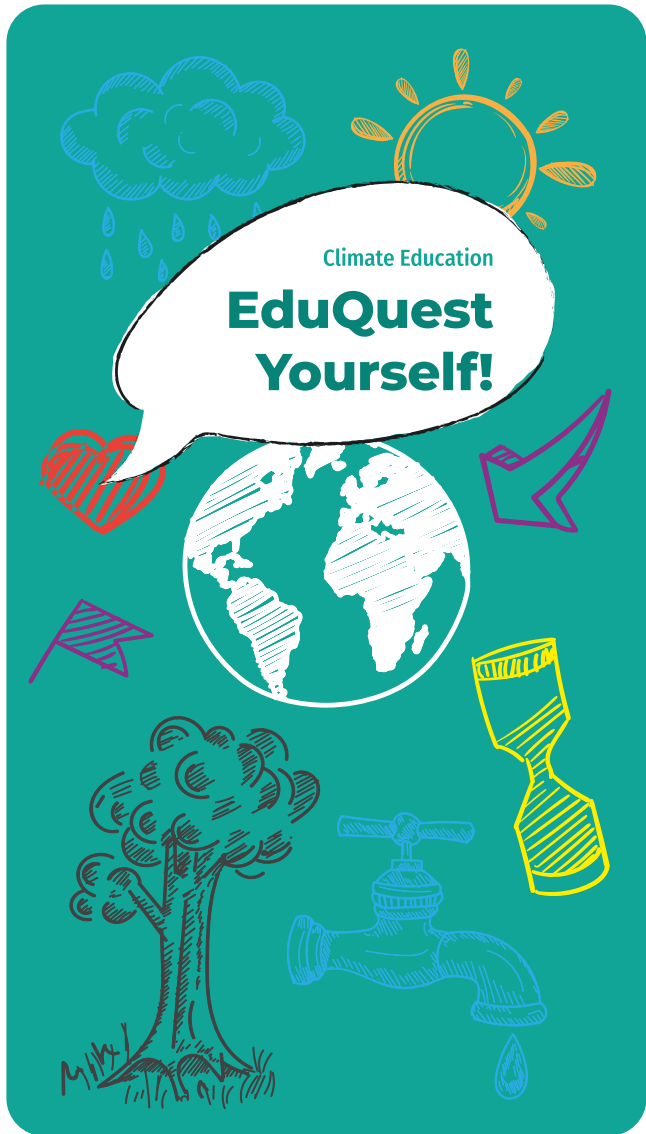
1. This entails the producer of goods who usually lives in a developing country receiving the true value of the goods.
2. With me, profit doesn't land in the pockets of middlemen, but is fairly divided between the parties.
3. I make coffee, tea, chocolate, banana, and even gold.
4. My ethical label consists of the colors green, black, and blue.
5. I help the producers of developing countries to make a living.
6. I respect, protect and support human rights and fight for the disadvantaged in international trade.
7. Sustainability is important to me.
8. I increase the chance for the growth of disadvantaged producers, especially women and indigenous peoples.
9. I protect children from exploitation.
10. I often distribute organic produce.

**Topic: CLIMATE CHANGE**

**GENETICALLY MODIFIED ORGANISMS (GMO)**

1. My genetic material contains DNA from other living organisms.
2. I'm dangerous if I enter the environment.
3. Experiments show that I can be responsible for allergies and stomach bleeding.
4. I couldn't have developed by myself.
5. The European Commission, the European Food Safety Authority, and the European Member States all partake in authorizing my products.
6. I'm considered to be modern biotechnology.
7. I can be patented.
8. The plants created with my technology can be divided into four groups: plants resistant to pesticides, plants resistant to pests, plants resistant to viruses, and plants for bioreactors.
9. I'm most common in soy and corn.
10. International corporations own and distribute me.
11. If I'm a product, my status must be displayed on the label.





# A game of questions and answers

**Topic: CLIMATE CHANGE**

**ORGANIC PRODUCE**

1. I come from organic farms.
2. My production is regularly monitored.
3. Using toxic chemicals for my growth is forbidden.
4. I can be a primal ingredient, forage, or foodstuff.
5. I'm healthy for the consumer while also being good for the environment.
6. My crest is a green rectangle with stars that form a leaf.
7. My vitamin levels and content values are above average.
8. I can be made from plants and animals.
9. I'm available in shops and markets.
10. If I'm a multi-ingredient food, I'm only considered a product if I contain 95% organically produced ingredients.

**Topic: CLIMATE CHANGE**

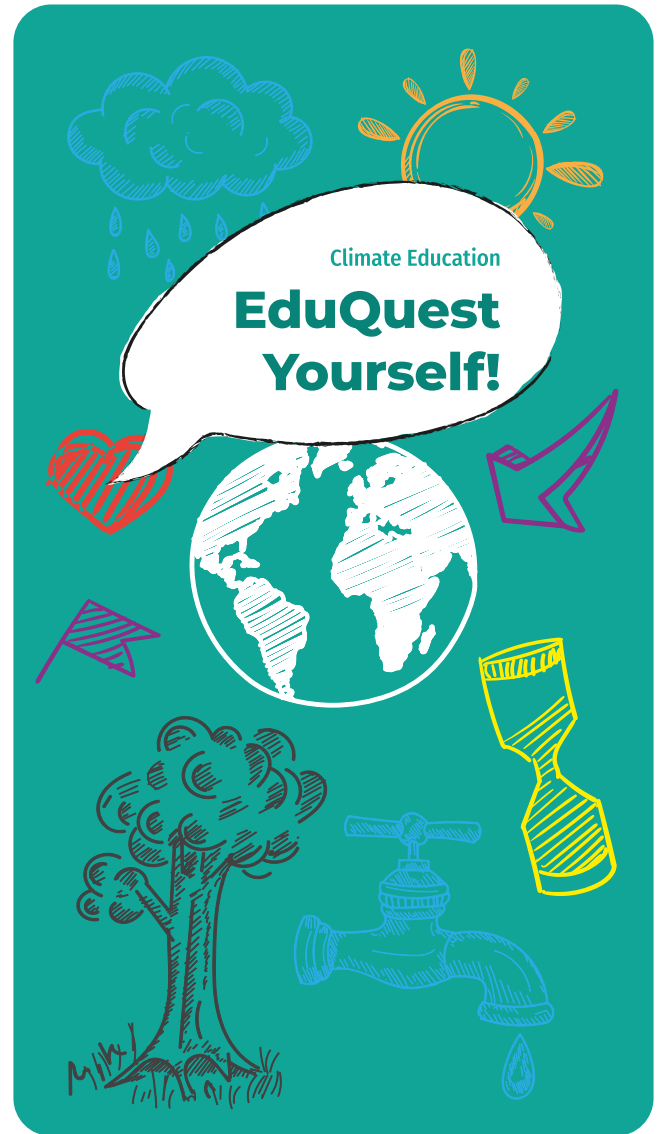
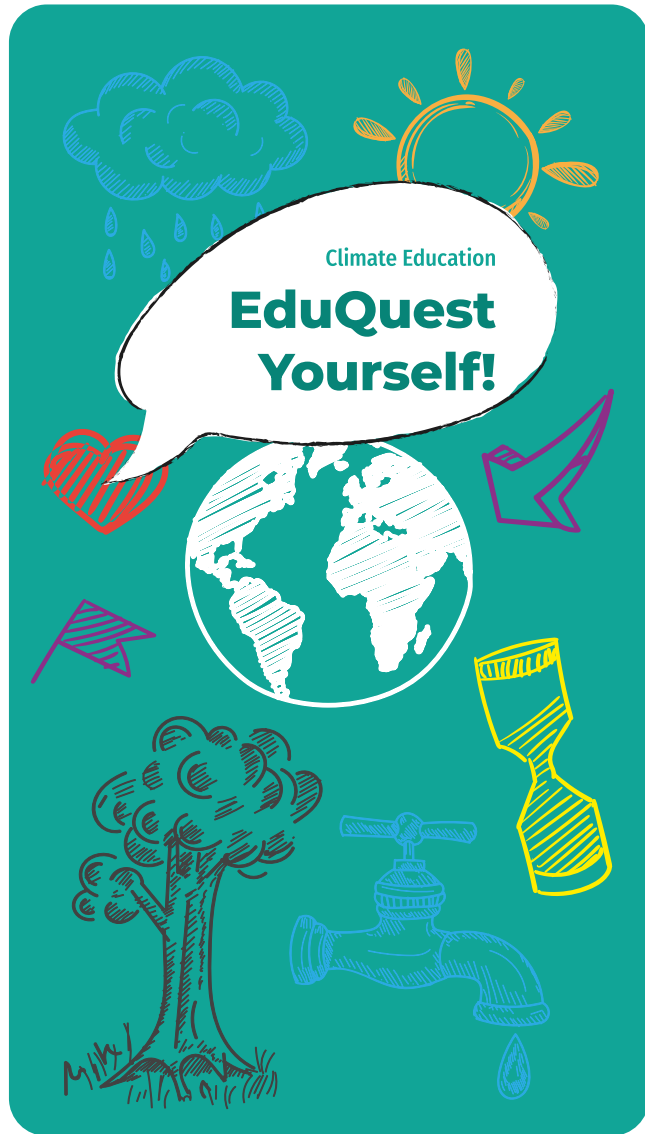
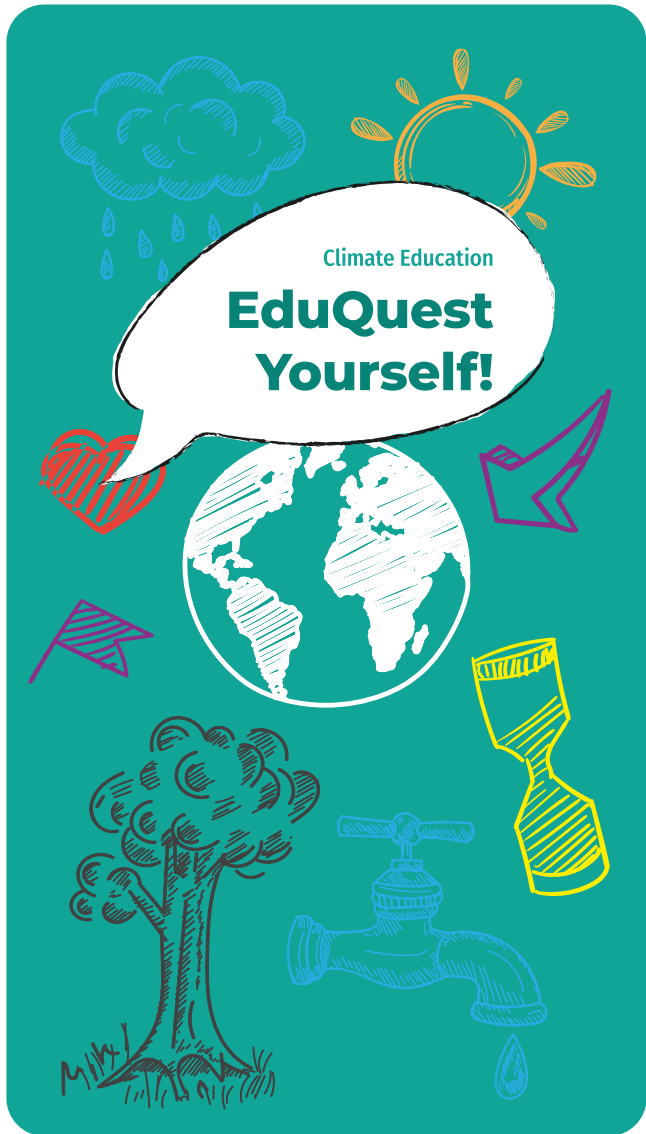
**LOCAL PRODUCE**

1. I'm produced nearby.
2. I'm often found in markets.
3. I'm usually made by regional farmers.
4. If you buy me, you support the communal economy.
5. My transfer requires less fuel than if I came from afar.
6. I can be cheese, jam, or crafted items.
7. You can often meet my creators directly.
8. I'm usually made on a smaller scale.
9. I'm not often found on the shelves of supermarkets.
10. I'm usually available only in smaller settlements.

**Topic: CLIMATE CHANGE**

**MONOCULTURAL FARMING**

1. I turn the scenery bland.
2. I use many -cides (pesticides, etc.).
3. I don't leave room for many animals or plants.
4. I don't offer jobs for many people.
5. I only grow one kind of plant.
6. I'm also known as industrial crop production.
7. I can grow a lot but that requires large quantities of chemical fertilizers.
8. I need a lot of land.
9. I work on many machines.
10. I represent one-sided agriculture.



# A game of questions and answers

**Topic: CLIMATE CHANGE**

**COMPOST**

1. I'm made of organic material.
2. I like dead leaves and grass.
3. Mushrooms, worms, bacterias, and microorganisms are my good friends.
4. I don't like sick plants, chemical-treated citrus peel, meat, or cooked food scraps.
5. I must get the required amount of carbon and nitrogen.
6. I don't like being too dry or too wet.
7. I like being turned over.
8. You can make a bin, crate, or box for me, but I like containers too.
9. I even use up kitchen waste.  
I will give you soil in return for what you put in me.
10. I will give you soil in return for what you put in me.

**Topic: BIODIVERSITY**

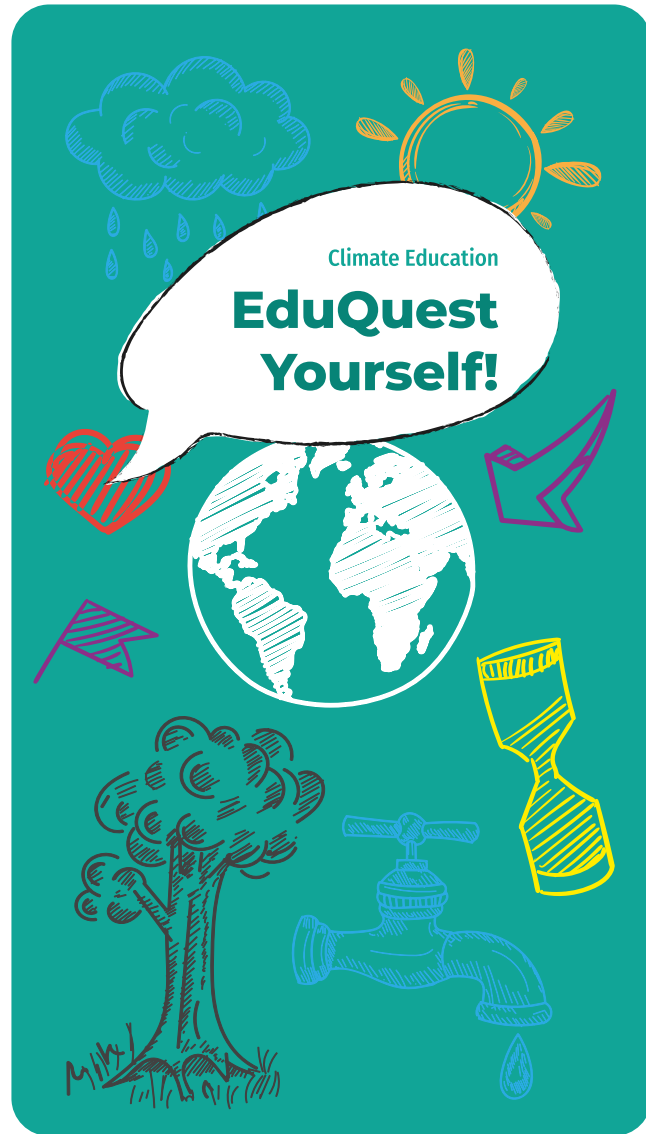
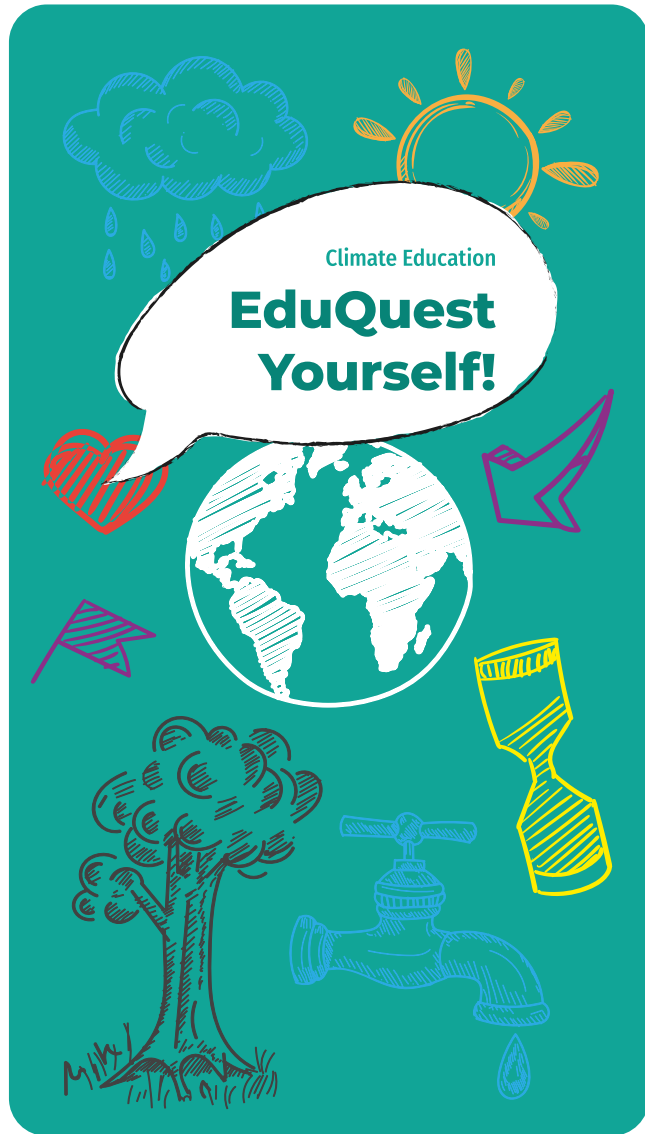
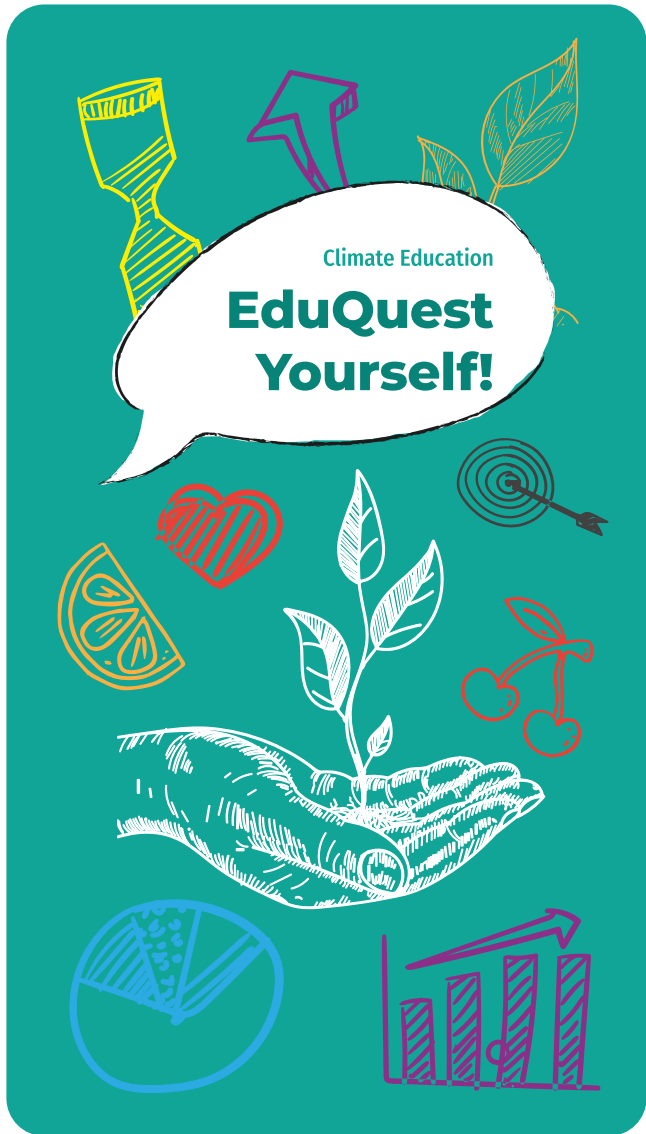
**INGENIOUS SPECIES**

1. We've been here for a long while.
2. We're used to the local climate and weather conditions.
3. I'm always linked to a certain physical region, let that be big or small.
4. I'm the most vulnerable of species.
5. In Europe my members include the Eurasian lynx, the European bison, the western capercaillie, and the Europe an bee-eater, just to name a few.
6. My habitat can be damaged by human activities which result in my population's decline.
7. I'm often found in national parks.
8. We're getting more fame lately.
9. One of our important roles is gene conservation.
10. Many of our species are protected.

**Topic: BIODIVERSITY**

**INVASIVE SPECIES**

1. With good climate conditions, I can spread quickly to a new environment.
2. Without natural enemies, I breed quickly.
3. I pose a threat to European biodiversity.
4. I can affect food production, and I may even risk human health, so if I become established, you may face societal and economic consequences.
5. Globalization helped me arrive at new places.
6. The EU even accepted strategies against me.
7. The EU tries to eradicate or isolate me, but they also try to prevent my arrival.
8. I pose an international threat.
9. I often displace indigenous or protected species in an area.
10. I'm not always harmful, but you should still be cautious and identify me.



# A game of questions and answers

**Topic: BIODIVERSITY**

**POLAR BEAR**

1. Thanks to my thick fur I don't get cold.
2. I wander on the glaciers of the Arctic circle.
3. As a result of climate change I may go extinct.
4. I'm as white as snow itself.
5. Although I swim well, I live in ice fields.
6. Thanks to the greenhouse effect, ice is melting under my feet and I'm becoming homeless.
7. My favorite meal is the seal, but I'm not a picky eater: I will eat birds and fish too.
8. I'm currently the biggest carnivorous land mammal in the world.
9. The cumulative toxic materials in my food chain (for example, oil spills) also threaten my safety.
10. I usually wander about alone, but the cold doesn't bother me anyway.

**Topic: BIODIVERSITY**

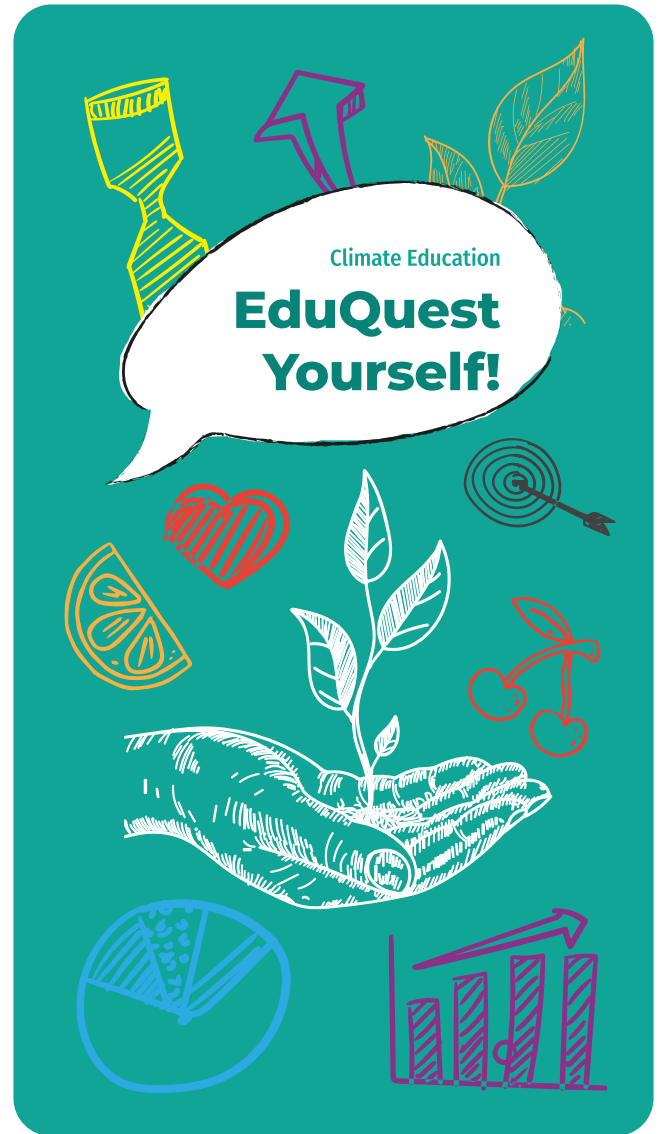
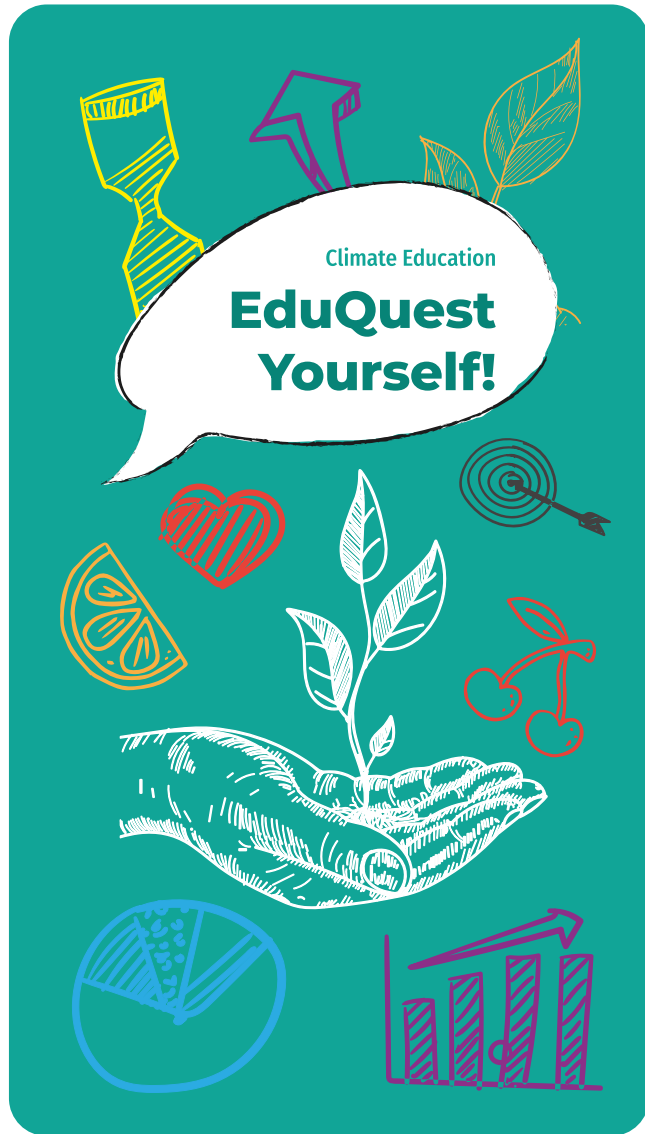
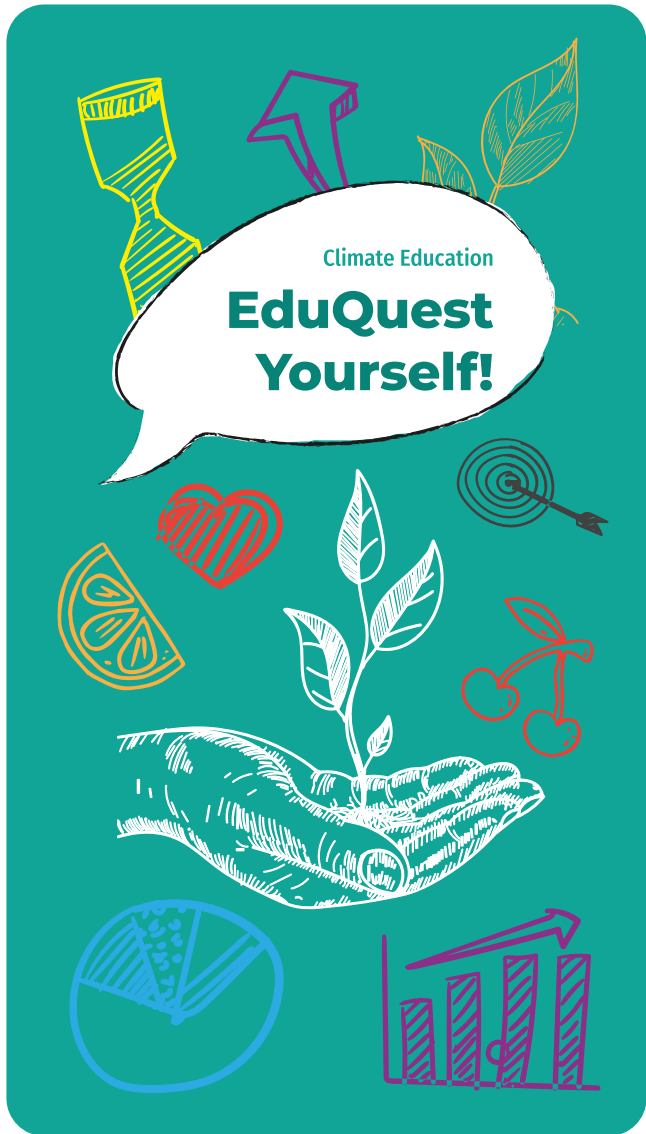
**GIANT PANDA**

1. I'm the symbol of the protection of animals all around the world; I'm even on the logo of the WWF (World Wildlife Fund).
2. I'm endangered, and there are still only 1,800-3,000 of us with our breed mates and 673 of us still living in zoos.
3. I love bamboo!
4. In the wild, I only live in China.
5. My thick wooly coat is mainly white, but my front and back paws are black.
6. I am cute, so people take care of the forest where I live. So many other endangered animals find shelter there as well as me.
7. My numbers have decreased thanks to climate change and human activity.
8. China may gift me to foreign zoos in diplomatic efforts.
9. Both my eyes have black circles underneath but I'm not even tired.
10. Of all mammals, my newborn is the smallest compared to me.

**Topic: BIODIVERSITY**

**AFRICAN ELEPHANT**

1. I'm the largest and strongest terrestrial mammal in the world.
2. I live in the African Savannah, and I tolerate the heat but only if there's enough water.
3. Poachers are driving me close to extinction.
4. Rich people make jewelry and furniture from my body even though it's illegal.
5. I like tree leaves, the grass of the Savannah, and fruits.
6. I live in large families with unique traits.
7. My nose is very long, and it allows me to siphon 4-10 liters of water at once.
8. We travel a lot in search of water and may walk 80 km a day.
9. When I'm agitated, I stir up a dust storm and it doesn't do good to stand in my way.
10. I'm protected and it's been forbidden to hunt me since 1988.



# A game of questions and answers

Topic: BIODIVERSITY

## EUROPEAN POND TURTLE (EUROPEAN POND TERRAPIN/TORTOISE)

1. I live in ponds, lakes, and shallow, muddy still waters.
2. In Europe, I prefer the Southern and Eastern areas.
3. My biggest competitor is the quickly spreading red-eared slider which eats my food.
4. I'm also in danger of polluted and devastated wetlands.
5. I'm a reptile.
6. My shell protects me from predators, but I have to protect my eggs.
7. I swim well and I like to rest and sunbathe on logs and stones sticking out of the water.
8. I'm not a picky eater and I will eat the arthropods, amphibians, worms, and mollusks in the water.
9. I'm the only freshwater turtle indigenous to Hungary.
10. My shell can grow as big as 20-30 cm.

Topic: BIODIVERSITY

## EURASIAN LYNX

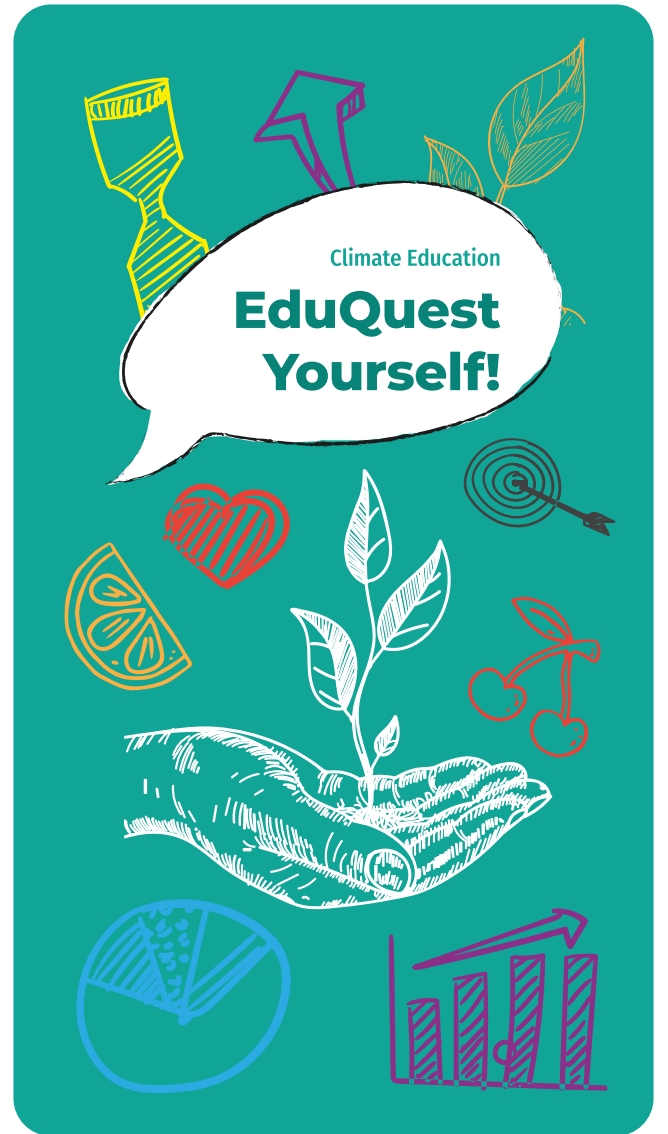
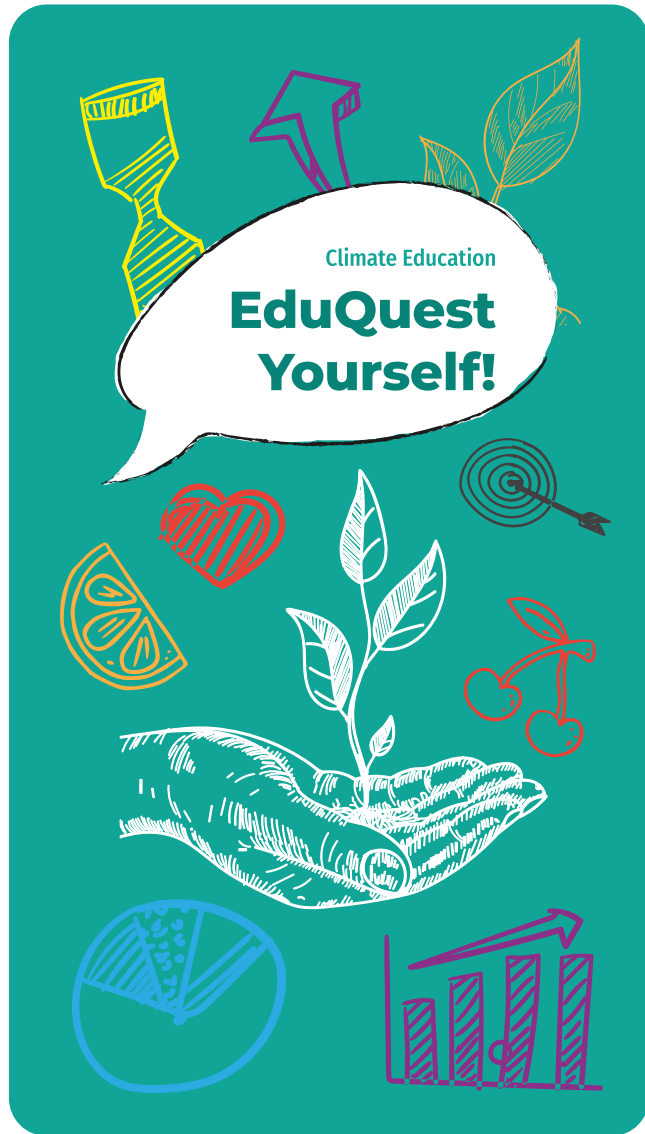
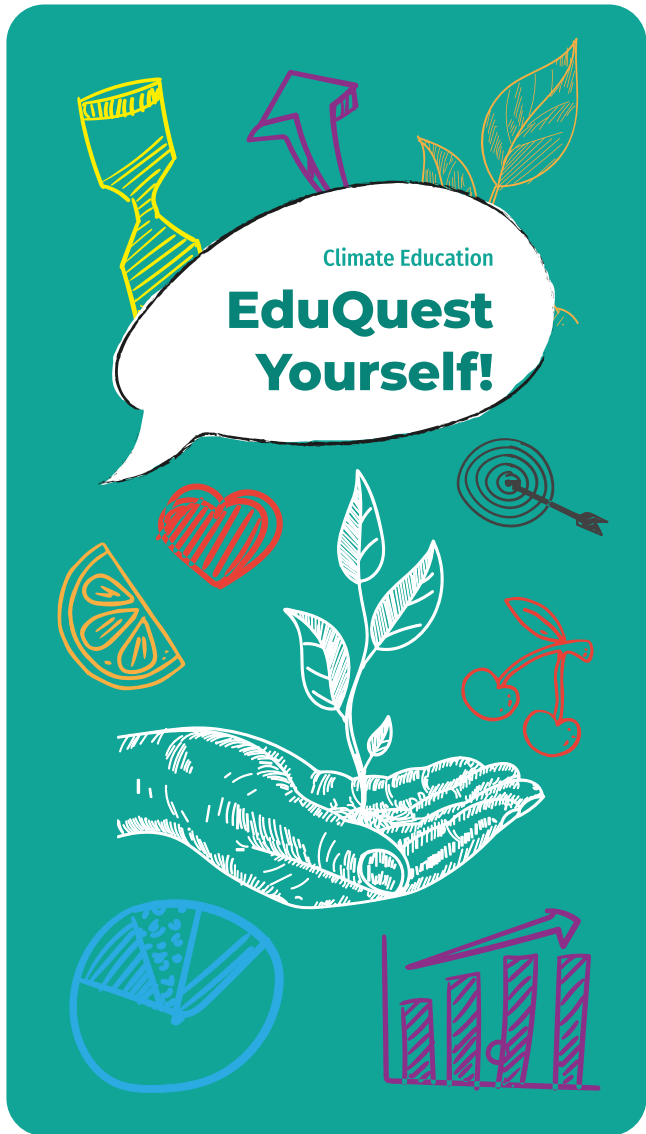
1. I used to populate all of Europe, but excessive hunting has almost led to my extinction.
2. I'm an indigenous species.
3. I'm a feline in the wild, although no bigger than a Vizsla (or Pointer, or Whippet).
4. My tail is short for a cat, there are tufts on my ears and I have a beard around my face.
5. I lead a secretive and solitary and I don't like people, unlike my distant relative, the house cat.
6. My hunting ground ranges up to 60-80 km<sup>2</sup>, therefore I contribute to managing an entire wildlife area and preventing overpopulation.
7. I've gone extinct in Hungary during the last century.
8. I'm a good climber and like to hunt in the snow.
9. I'm a predator and eat everything from small mice through rabbits to fawns.
10. I'm usually active during the night, but if I'm hungry, I can hunt during the day, too.

Topic: BIODIVERSITY

## WHITE STORK

1. My plumage is mostly white, with some black feathers at my wingtips.
2. I'm widespread in Europe and Asia but my natural habitats are diminishing.
3. With my long bill, I can catch all kinds of prey: bugs, fish, amphibians, reptiles, and even smaller mammals.
4. I live right alongside humans. I build my nests on top of tall electric poles, which have their dangers.
5. I build huge nests of twigs and sticks.
6. Before winter sets in, I meet with my kind and we move 12,000 km south, from Europe to Africa.
7. When I talk to my mates, I move my bill to make a clattering sound.
8. I'm loyal to my partner and will do anything for my chicks, even sacrificing my life for them.
9. I was present even in ancient Egypt as a hieroglyph, and I symbolized parental love in Roman and Greek mythologies.
10. Some say I bring the children to the parents.





# A game of questions and answers

**Topic: BIODIVERSITY**

**HONEYBEE**

1. Although I'm small, my impact is huge and I play a crucial role in keeping plants alive and helping them reproduce.
2. I'm usually calm and only sting when you scare me with sudden movements.
3. You can thank me for fruits, honey, and pollen too.
4. I symbolize busyness.
5. I have a very refined sense of direction: I follow the Sun in the sky, and when I reach my goal, I rely on my sense of smell.
6. I live in a family of 10,000 individuals and we even have a queen.
7. Using insecticides will harm me, but mites can also make me sick.
8. I'm found all around the world in the temperate and tropical zones.
9. I communicate through „dance“ that can show where food and water are down to a centimeter.
10. I can only fly if my body temperature is over 35 degrees Celsius, which I can reach by buzzing.

**Topic: BIODIVERSITY**

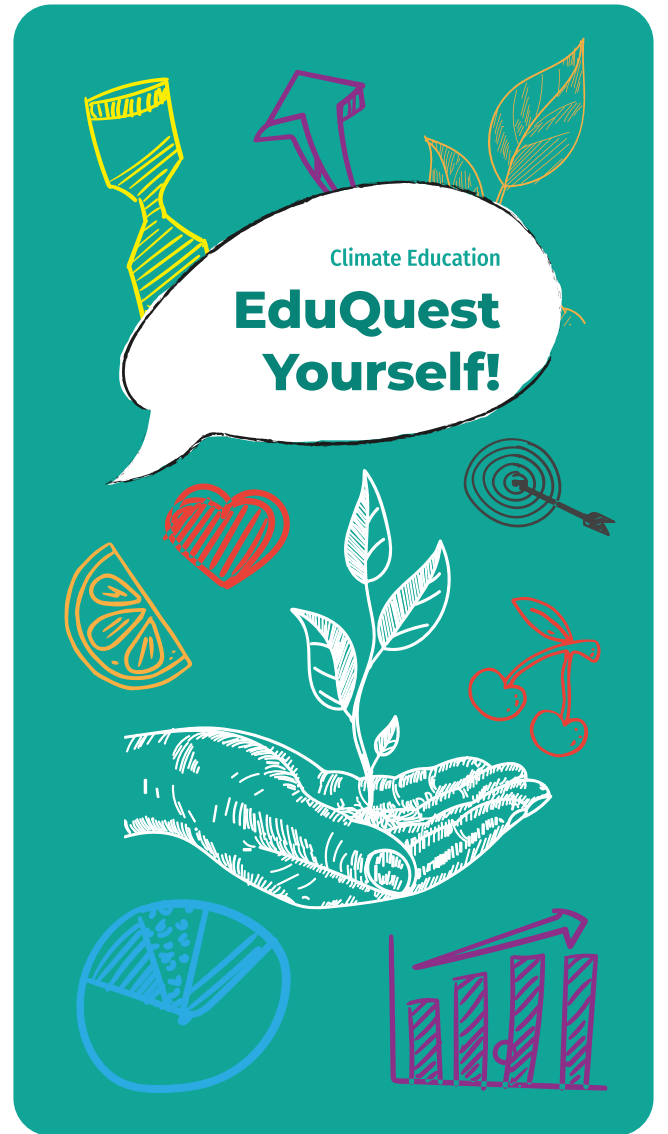
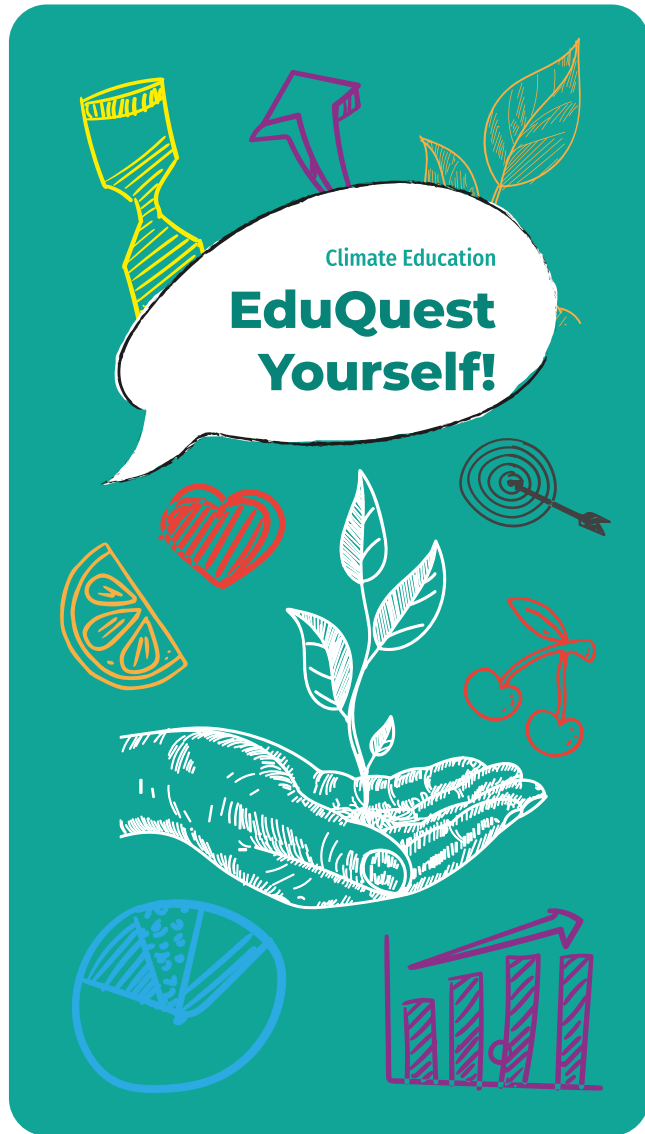
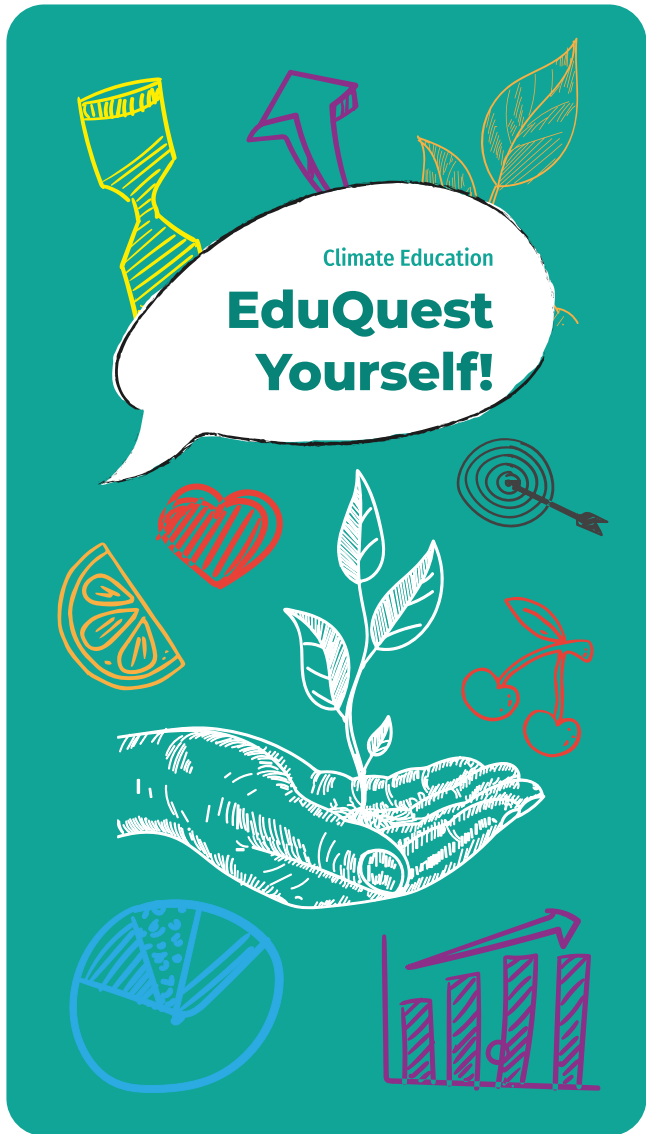
**RED SQUIRREL**

1. My fur ranges from dark brown through red to quite a pale brown, too.
2. I can jump up to 4–5 meters.
3. My nails can hold my full body weight.
4. I can survive 30-meter falls.
5. My teeth are constantly growing.
6. I store my food: I hide my nuts and berries in burrows down by the roots, underground, for the cold seasons.
7. My main enemies are hawks and martens.
8. I can differentiate between colors. I see in the same way as people who mistake green for red.
9. My ear-tufts are longer during the winter than in the summer.
10. Pine seeds, plant juices, acorns, nuts, walnuts, berries, mushrooms, bugs, eggs, and even chicks are my favorite foods!

**Topic: BIODIVERSITY**

**EURASIAN SPOONBILL**

1. I don't need utensils but I still have a spoon.
2. I can only find food in shallow waters where my legs reach the bottom.
3. I'm a migrating bird and spend my winters by the ocean.
4. I'm relatively quiet and don't make much noise.
5. I had a hieroglyph of myself in ancient Egypt.
6. My latin name is: Platalea leucorodia
7. I don't like long droughts.
8. My pale yellow chest is similar to a pelican's.
9. When it's time to choose a partner, my crest goes from the crown of my head to my backside.
10. My spoonful of breakfast includes leeches, mollusks, fish, and amphibians.



# A game of questions and answers

**Topic: BIODIVERSITY**

**EUROPEAN BEE-EATER**

1. I'm an indigenous European species.
2. I try to get rid of my prey's sting before I eat them.
3. I don't like other wanna-bees.
4. I build my homes in sand or loose walls.
5. My plumage is beautiful and richly colored in sunlight: my belly is green and blue, my upper parts and head are maroon, and the spots on my shoulder and my throat are golden. My eyes and throat are outlined in black.
6. I'm very persistent and will fly into walls if needed.
7. I can travel up to 2,500-10,500 km every winter as I move south in search of enough bugs to feed me.
8. Insecticides will indirectly poison me, too.
9. My eating habits see me blamed for atrocities, but I'm usually not to blame.
10. When I move, I loan my flat to all kinds of snakes and lizards.

**Topic: BIODIVERSITY**

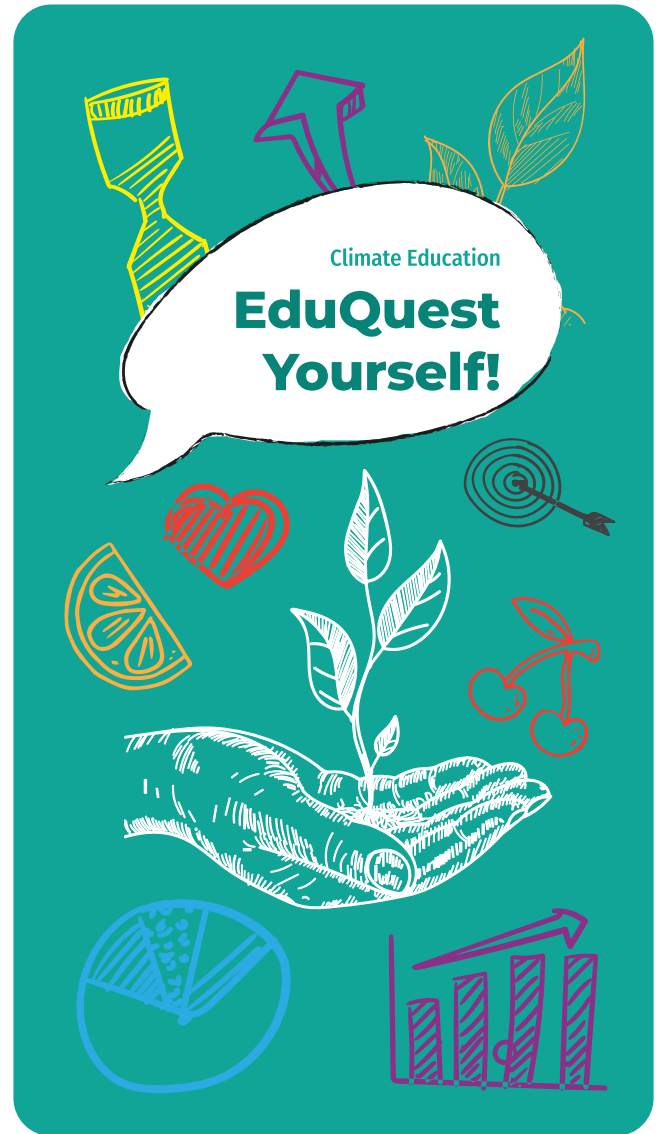
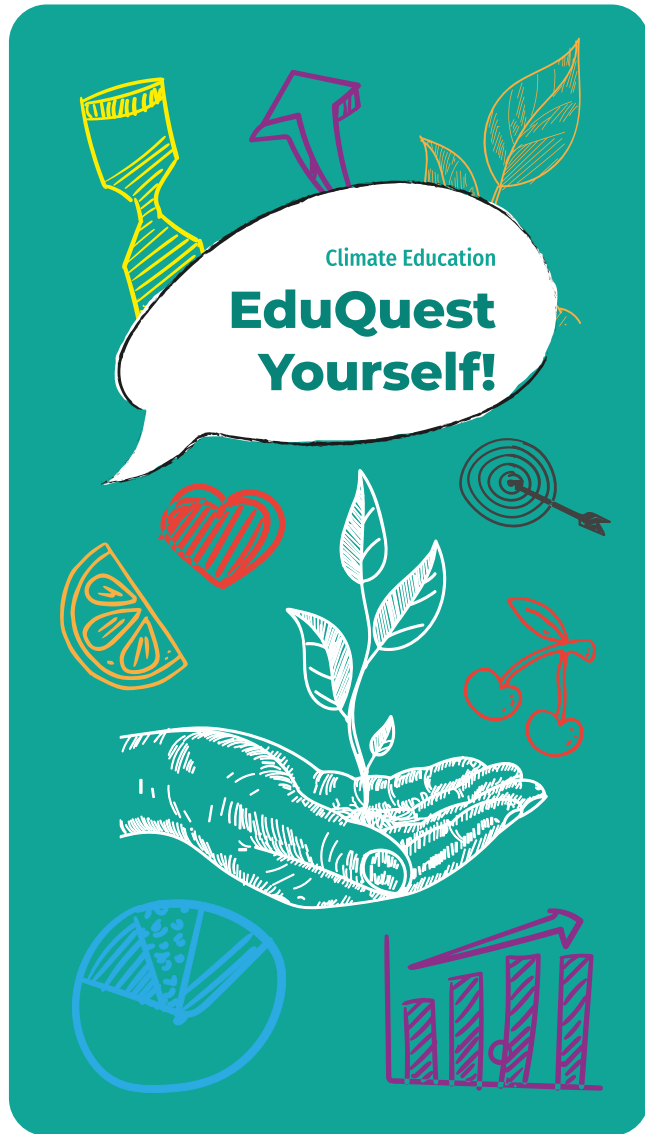
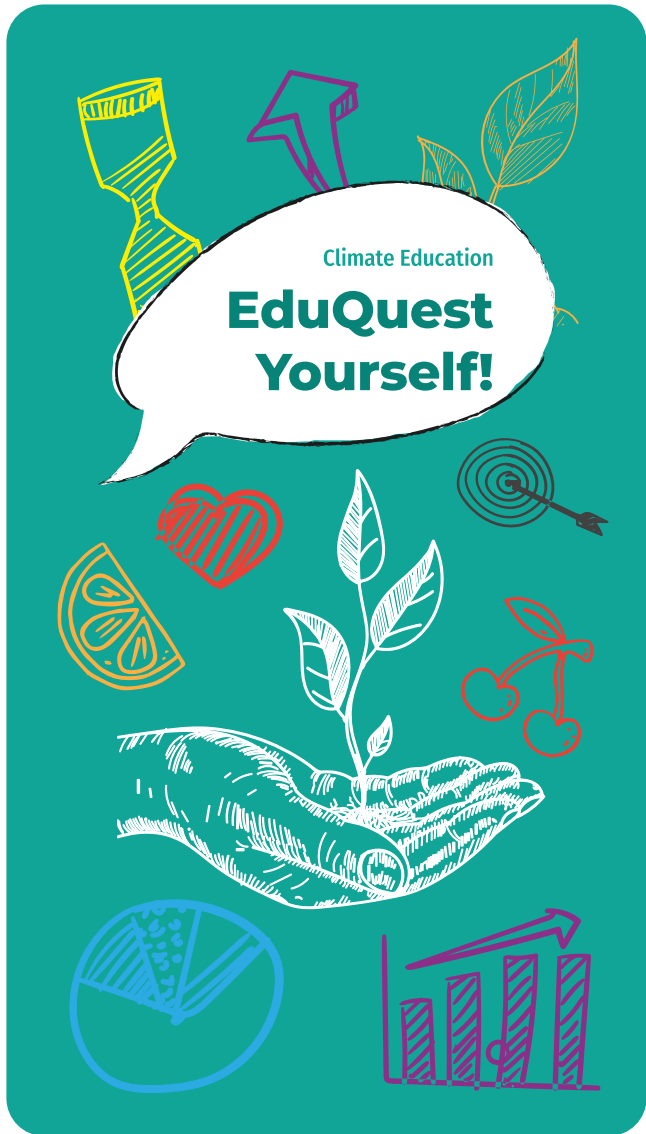
**NORTHERN  
WHITE-BREASTED  
HEDGEHOG**

1. You can often meet me at night.
2. I prefer sleeping through winter in leaves or compost.
3. I'll take any worms, caterpillars, and slugs for dinner!
4. I'm the biggest insectivore mammal native to Hungary!
5. Unfortunately, ticks like me very much.
6. I have a very specific skin type and my skeleton is flexible.
7. I'm very soft as a newborn, then I toughen up.
8. Sometimes I'm in a picky mood!
9. I can't clean or scratch myself.
10. My most feared enemies are foxes and badgers.

**Topic: BIODIVERSITY**

**COMMON TOAD**

1. I'm found everywhere in Europe except for Ireland.
2. There's no use kissing me.
3. I can live up to 30–40 years.
4. Some may find me ugly, but they're wrong.
5. I don't jump, I just „walk“.
6. My backside is mostly greyish, brown, or olive-colored, but I can sometimes be sandy yellow or red.
7. When an attacker comes, I blow myself up and raise my hind legs.
8. My main toxin is called bufotoxin.
9. I have green cousins too!
10. I'll pee myself if I get scared!



# A game of questions and answers

**Topic: BIODIVERSITY**

**GREAT SPOTTED  
WOODPECKER**

1. I'm quite great!
2. My tongue is sticky and long.
3. My hat is black, my vest is white, my trousers are red.
4. My unsociable, argumentative and rowdy personality starts showing when I'm young.
5. They call me the doctor of trees.
6. Even though I'm a bird, I don't make traditional nests.
7. I like playing the drums!
8. I don't travel great distances because my rounded wings aren't meant for long-term travel.
9. My third finger can be moved back and forth.
10. I'm not one to get concussions!

**Topic: BIODIVERSITY**

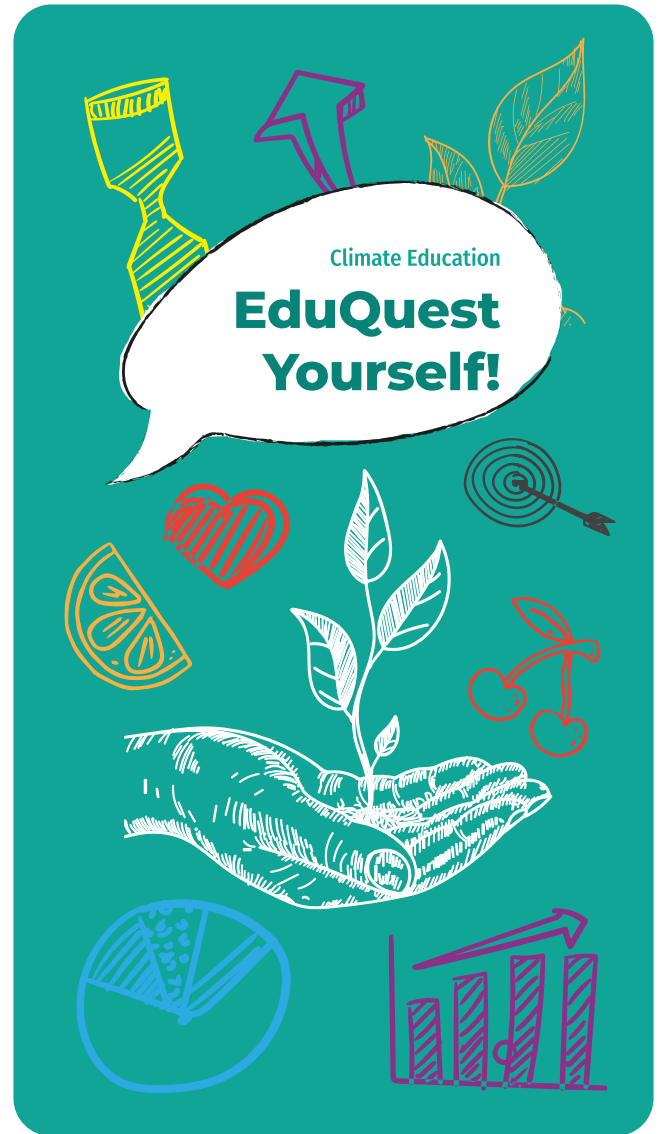
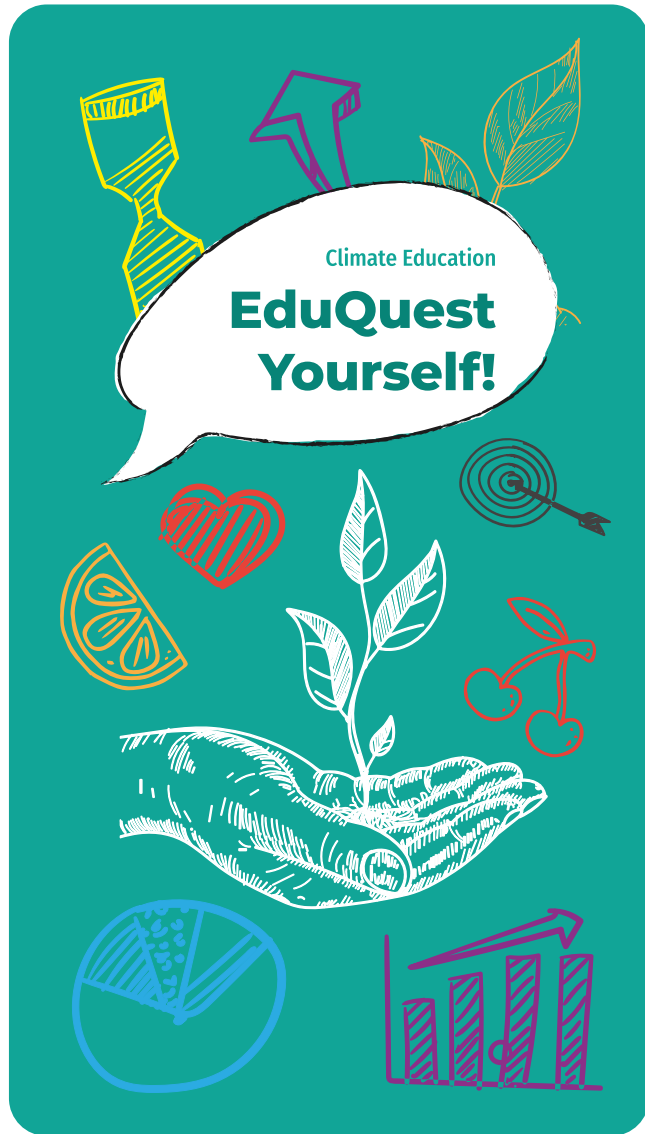
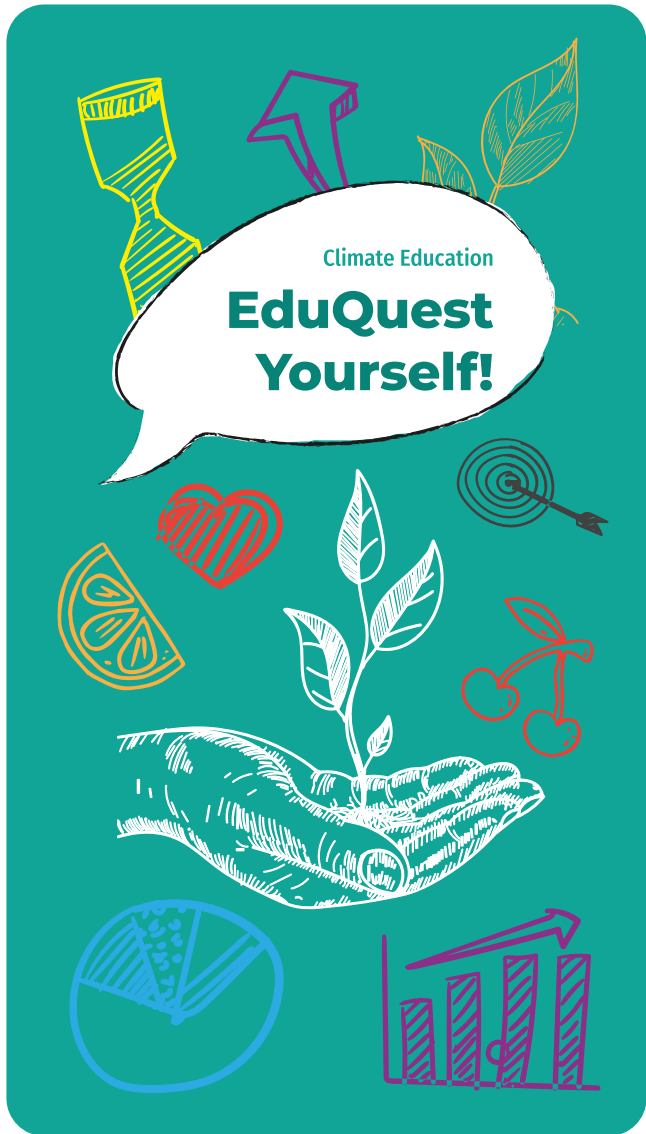
**ENGLISH OAK  
(COMMON OAK/  
PEDUNCULATE OAK/  
EUROPEAN OAK)**

1. I'm the dominant oak species in Europe.
2. I'm one of the seven oaks of the Carpathian basin.
3. My bark is deeply fissured and dark, and I can be 45 m tall.
4. I prefer mild winters with bedrock and loamy soil of average depth.
5. I can live up to 800–1000 years if the conditions are right.
6. I bloom in April and May, and my flowers of small pistils sit on a common stem in groups of 1-5 (peduncles).
7. My acorn has been used to feed pigs, and adding iron sulfate to my galls produces iron gall ink.
8. My wood is dark brown and hard, resistant, with nice markings making it valuable.
9. I can even treat skin diseases and oral issues thanks to the tanning agents in my bark.
10. I ornament parks in Australia.

**Topic: BIODIVERSITY**

**BALTIC PINE  
(SCOTS PINE/  
SCOTCH PINE)**

1. I'm the most resistant and least needy coniferous tree.
2. Before the industrial revolution, the Scandinavian countries made tar from my sap.
3. I'm an impervious tree that tolerates cold, drought, and even low to moderate levels of soil and air pollution.
4. With the right circumstances, I can reach 20-35 meters in height.
5. I grow fast and live up to 400-500 years.
6. My conifers grow two on each stem, and my flowers are egg-shaped cones of 2,5-7 cm in length.
7. Essential oils can be made from my leaves, which are good for pulmonary tracts and gastrointestinal issues.
8. My wood is durable and contains sap, so I'm useful for furniture and paper-making.
9. The warmings and coolings of the ice age resulted in my natural habitats moving from north to south and back.
10. I'm not a popular Christmas tree because my sap is runny.



# A game of questions and answers

**Topic: BIODIVERSITY**

**SNOWDROP**

1. I have many names, including anemone and windflower.
2. I symbolize hope in Christian cultures, but I also did so in ancient Greek mythology.
3. My subterraneous bulb contains healing agents that are used to make medicine, but you shouldn't eat them because I'm poisonous.
4. I bloom in the spring, between when snow disappears and the trees dress in green.
5. In the stream banks of mountains, groves, floodplain forests, and valleys of streams, I appear in abundance.
6. I have one single flower that's white and bell-shaped.
7. I'm a protected species because many collect me for profit, which is dangerous for other species too.
8. I often appear in household gardens during the spring.
9. I symbolize the oncoming spring.
10. I have more than nineteen species that live in the Pyrenees, in Middle Europe and South Europe, at the Caspian sea, and in the Middle East.

**Topic: BIODIVERSITY**

**TROPICAL RAINFOREST**

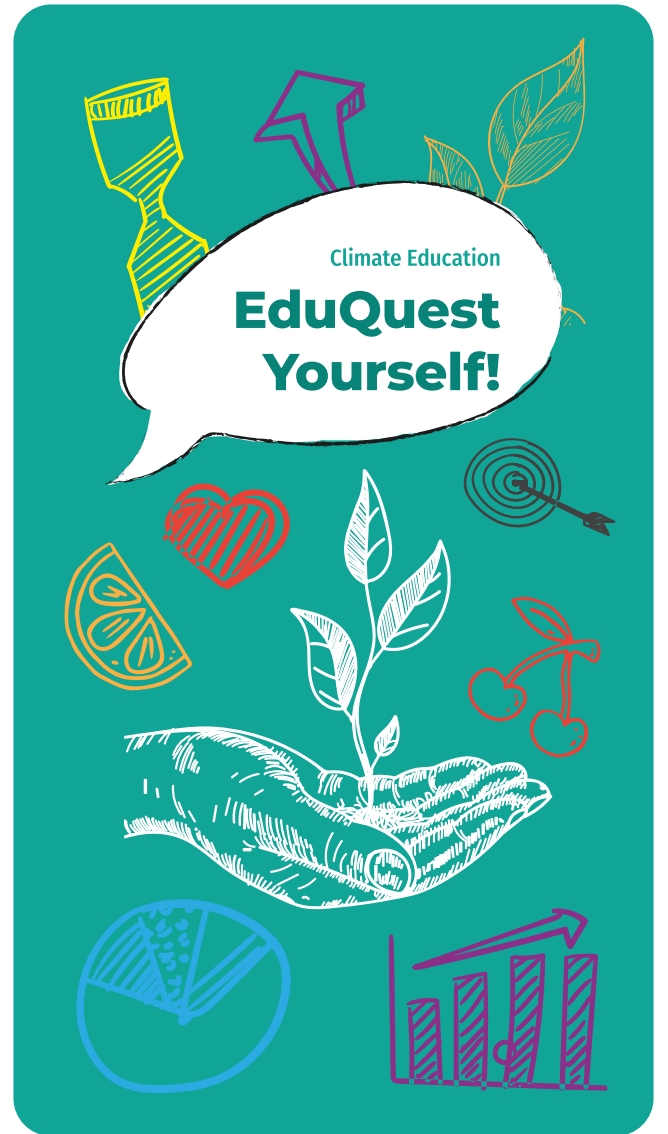
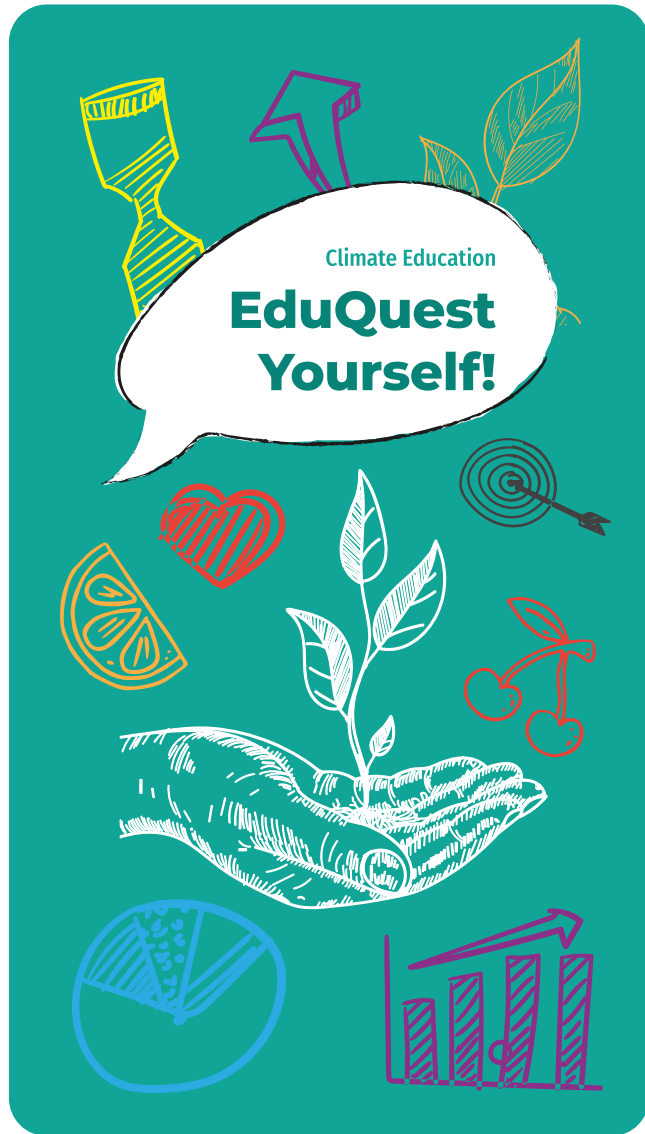
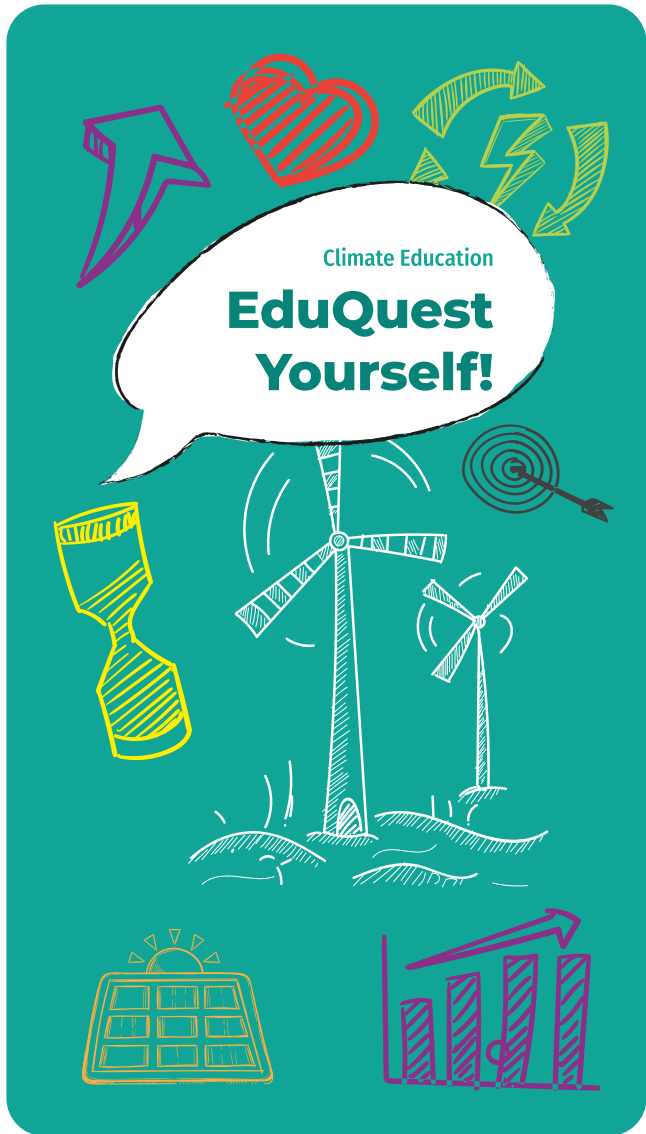
1. I'm a group of forests growing in rainy climates by the Equator.
2. I have three canopy layers, so my underbrush is sparse, but if there's a single spot without a tree, vines appear and I become a jungle.
3. I'm the largest in South America, in Amazonia.
4. We're evergreens with lots of rain: the yearly average is 1,250-6,600 mm.
5. I host half of the animal and plant life forms of Earth.
6. I'm also the largest pharmacy in the world because you get a fourth of your medicine from me.
7. I'm devastated by terrible deforestation and agricultural damage.
8. Many environmentalist groups dedicate their time to protecting me, like Friends of the Earth.
9. I'm important in protecting biodiversity, but about 17,000 of my species are killed annually.
10. My most famous plants are coffee, cocoa, banana, mango, papaya, and avocado.

**Topic: EFFICIENCY**

**HEAT PUMP**

1. I draw heat from the environment (heat source) and transfer it to your house.
2. I can cool things as well as heat them using clean, renewable energy.
3. I need an electric current to work.
4. I'm a closed system.
5. My pipes usually circulate antifreeze or refrigerant matter.
6. One of my variants uses the Earth's inner thermal heat.
7. Another type uses heat from the top 1.5–3 meters of the earth that's heated by the Sun.
8. One of my types is the split air conditioner, you can cool and heat with it.
9. I'm great at heating floors and walls.
10. My two types are the geothermal probe and the geothermal collector.





# A game of questions and answers

Topic: EFFICIENCY

## CONSCIOUS CUSTOMER

1. I take a list with me.
2. I always have my own bag.
3. I'm looking for local produce.
4. I don't like overpackaged goods.
5. I search for seasonal fruits and vegetables.
6. I'm glad to find organic products.
7. I always check what something's made of.
8. I don't like E-numbers.
9. I'd rather go to the market than to a hypermarket.
10. I prefer buying straight from the manufacturer.

Topic: EFFICIENCY

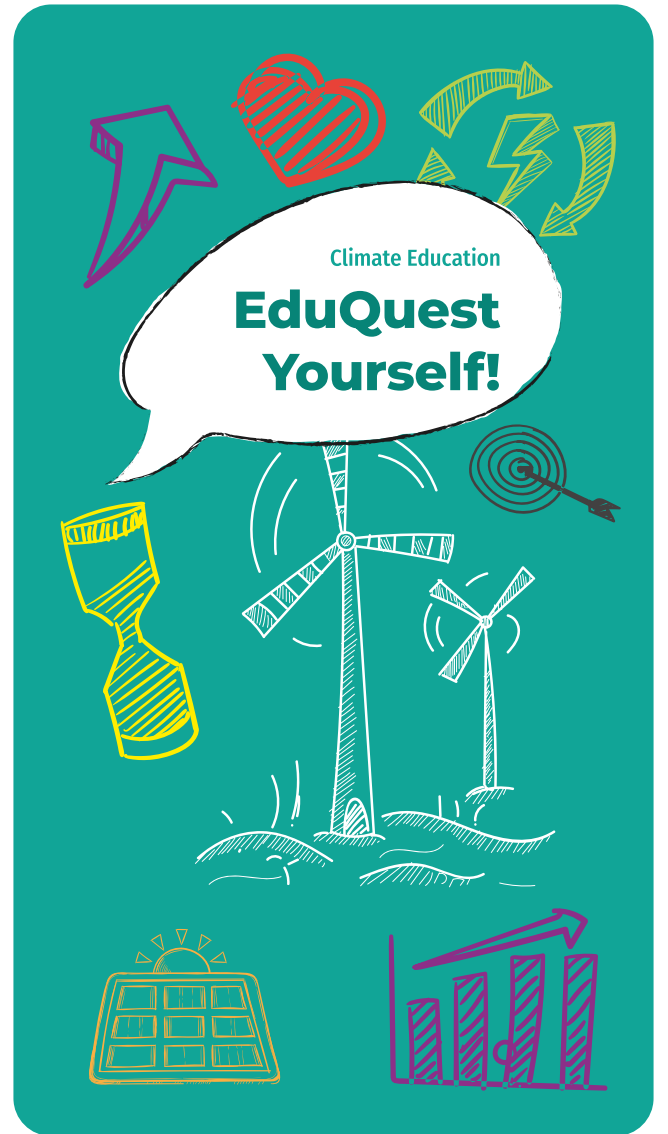
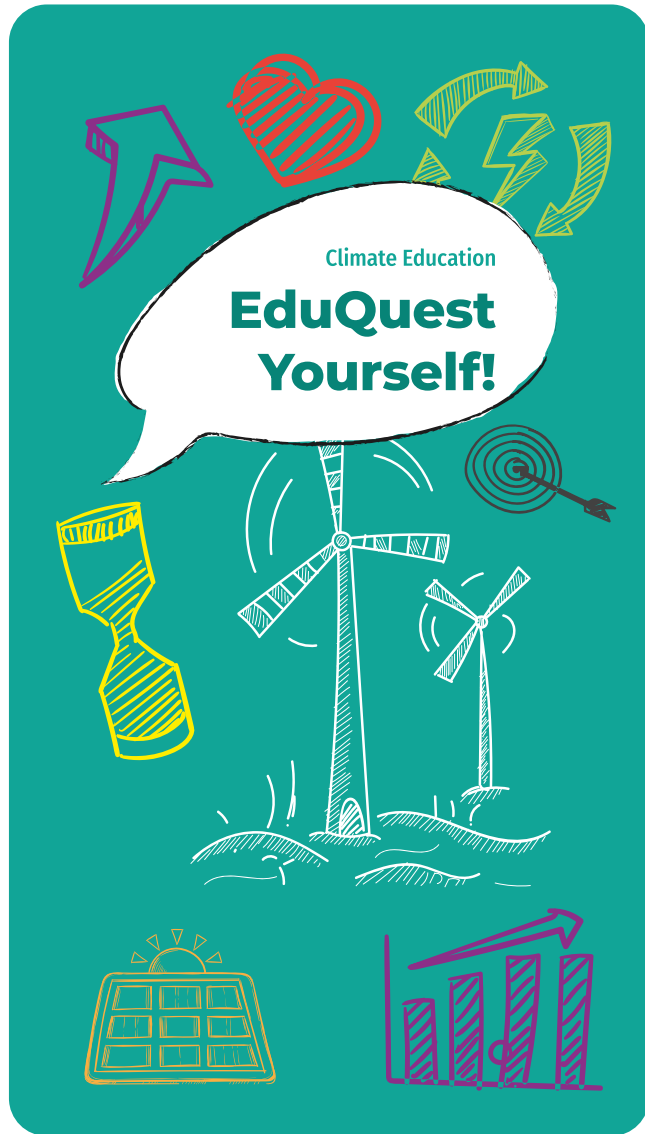
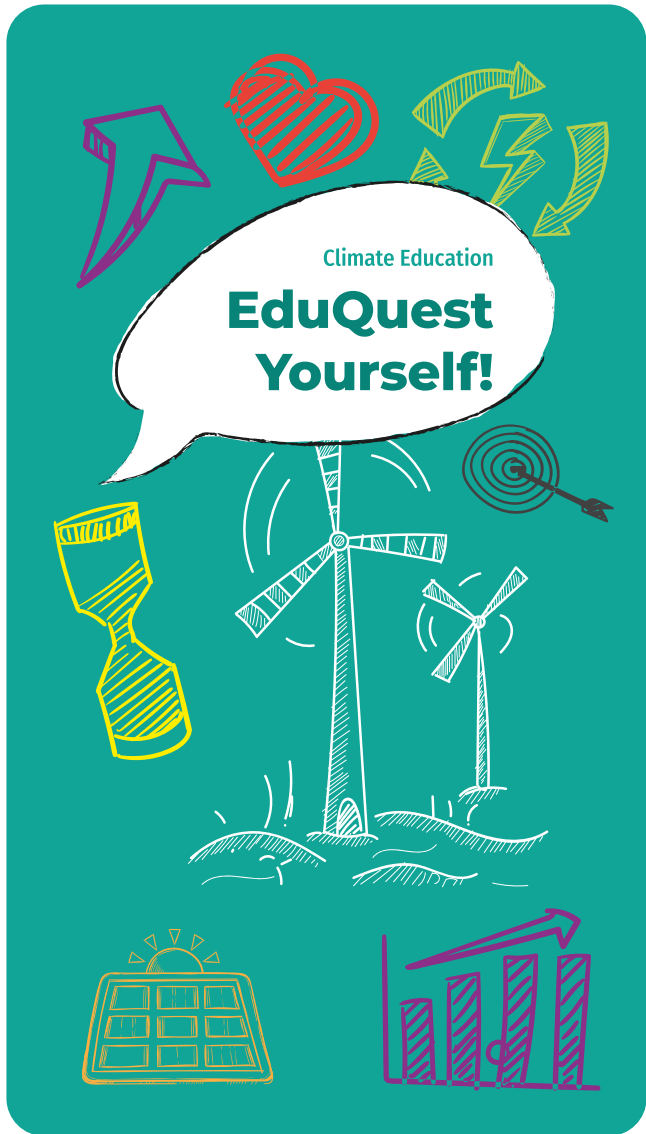
## TEMPERATURE

1. I'm an atmospheric indicator.
2. I measure thermal energy.
3. Different scales are used to describe me with numbers (Celsius, Fahrenheit, Kelvin, etc.).
4. I can even be measured in a human body.
5. My healthy range indoors is between 19-21 °C.
6. My global increase of 1,5-2 units has unforeseeable consequences.
7. I affect the state of matter.
8. My sign is: T
9. I will make you wear a jumper or dress down to your swimwear.
10. I have many types, including average, mean, lowest, highest, fluctuation, etc.

Topic: EFFICIENCY

## ENERGY SOURCES, FUELS

1. We can be used to generate heat.
2. You can even make electricity from us.
3. We have renewable, semi-renewable, and non-renewable types.
4. A non-renewable type is uranium.
5. My fossils (crude oil and natural gas) are used through burning.
6. Cars work with them.
7. We're also in people's homes (gas, wood for burning).
8. My renewable types are sunlight, air, water, and geothermal heat. (Biomass is semi-renewable.)
9. Using renewable sources can be beneficial for the environment depending on where and how it's used.
10. Overusing semi-renewable sources (eg. biomass) can be damaging to the environment.



# A game of questions and answers

**Topic: EFFICIENCY**

**ENERGY SAVING**

1. You can feel me in your wallet.
2. I'm a consumption attitude.
3. If you follow my lead, you'll use less energy (power and heat).
4. High power bills will urge you to follow my lead.
5. I'm the antithesis of splurging.
6. If you like me, you'll turn off the lights when you exit a room.
7. I don't like leaving the windows open in the winter.
8. It's important to me that you turn off the devices not in use instead of leaving them on standby.
9. I prefer board games to using electric gadgets.
10. I think many energy-wasting or unnecessary electrical appliances could be eliminated (e.g. electric lemon squeezers, can openers, knife sharpeners).

**Topic: EFFICIENCY**

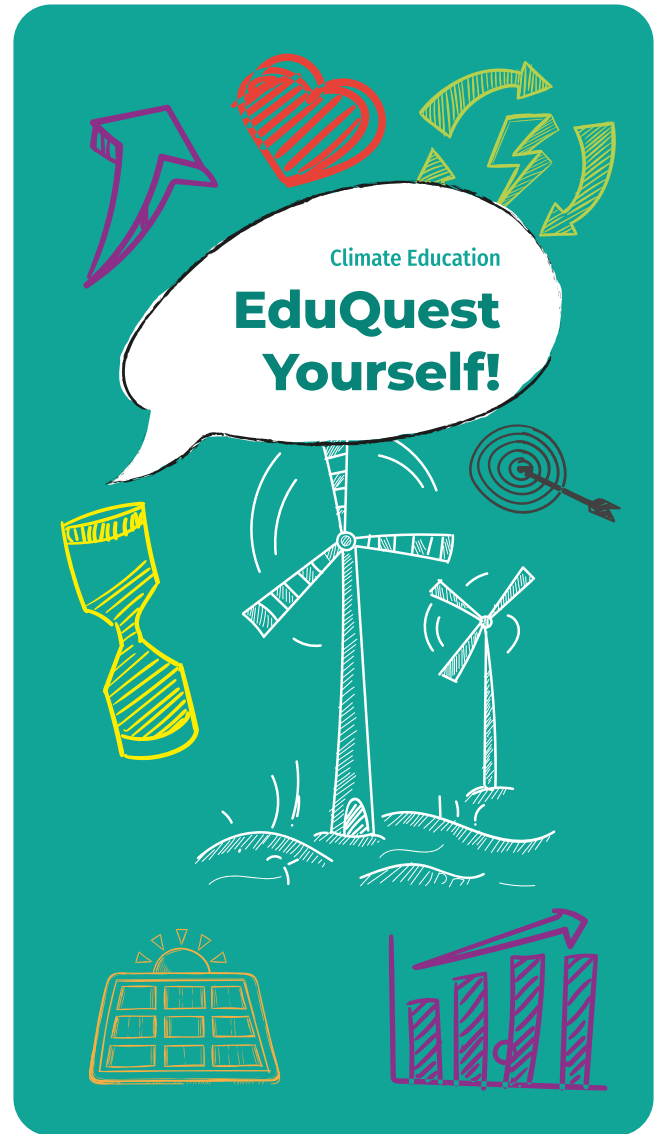
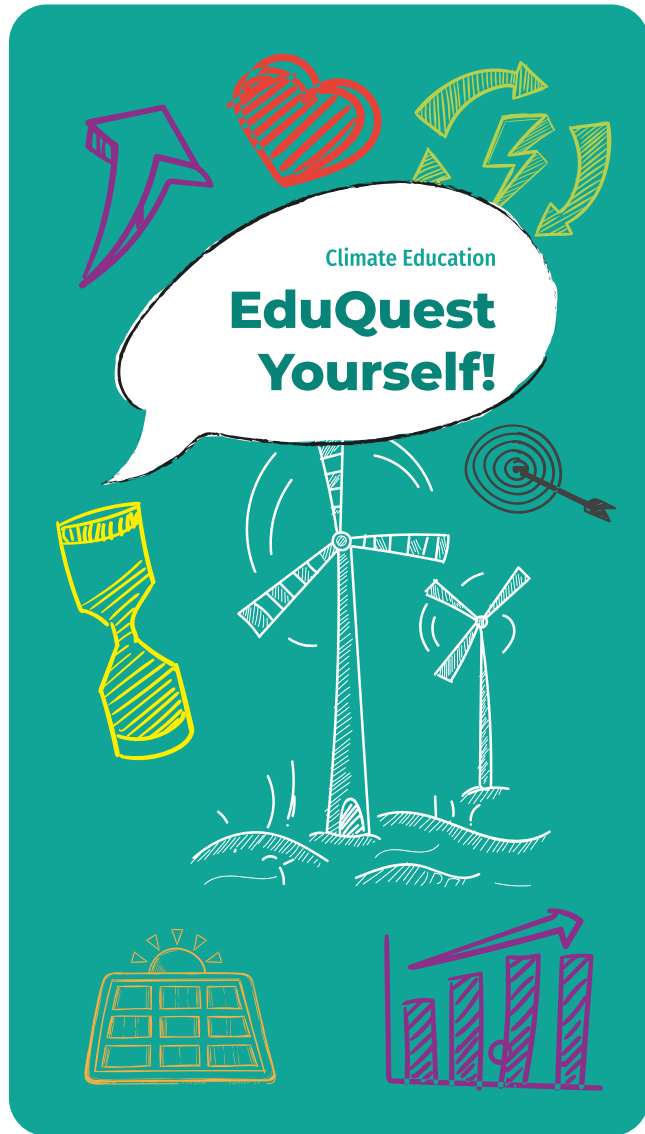
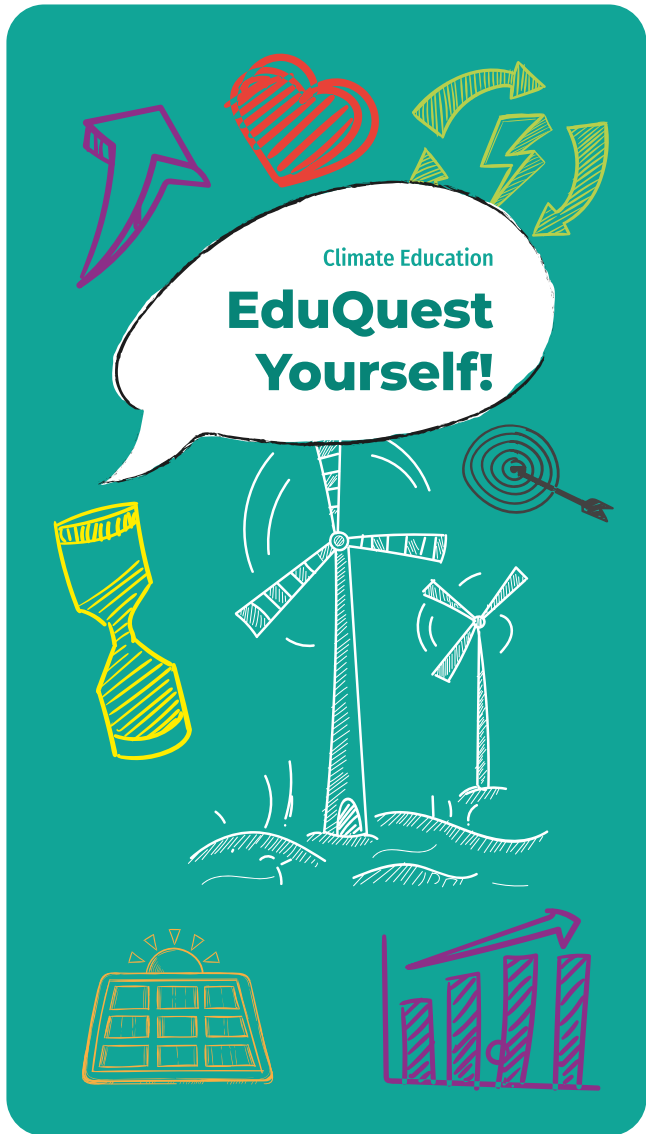
**ENERGY EFFICIENCY**

1. I showcase how many products or services were created with one unit of energy.
2. I'm a ratio.
3. I'm the ratio of a given product or service and the energy needed for it.
4. For buildings, small and large machinery (equipment), an energy label is used.
5. I'm important but not omnipotent. If you only use me without being mindful you may make the problems worse. (With a more efficient car, I spend less on fuel, so I can drive more, but my overall energy use and emissions may increase.)
6. You may assess me by energy types, or per device, factory, industry, geographical area, or even a single person.
7. I'm also used to simply describe the efficiency of a building's heating system (the ratio of the amount of input and output energies, ie. the amount of heat loss).
8. The energy audits, that is, the energy certification of buildings also usually focuses on me.
9. I'm often confused with energy saving, but we're not the same.
10. Spending money on me is worth it in the long run.

**Topic: EFFICIENCY**

**GREENHOUSE EFFECT**

1. I'm found in a planet's atmosphere.
2. I'm full of gas (I'm made up of the composition of gasses in the air).
3. I'm an effect.
4. Without me, there wouldn't be life on Earth (the Earth's average surface temperature would be -18 °C instead of our current 15 °C).
5. Human activity has intensified
6. in the last 100–150 years.
7. I don't let heat escape the atmosphere.
8. If I overheat the planet, the weather goes crazy and natural habitats get destroyed.
9. My naturally present gasses are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.
10. I'm fed by artificial fertilizers (nitrous oxide), large-scale animal husbandry (methane), crude oils and natural gasses, certain solvents, and old freezers (hydrofluorocarbons).
11. I got my name from agriculture.



# A game of questions and answers

**Topic: EFFICIENCY**

**CARBON DIOXIDE**

1. You exhale me.
2. Burning coal, natural gas and oil create me.
3. Plants bind me.
4. I'm a greenhouse gas.
5. I'm colorless, odorless, and non-flammable.
6. I'm naturally present in the atmosphere, but my quantity matters.
7. I'm responsible for more than 60% of the man-made, increased greenhouse effect.
8. Humans try to reduce my presence in the atmosphere because I play an important role in climate change.
9. I'm heavier than air and am water-soluble (eg. soda drinks).
10. I will sting your tongue when I'm in the water.

**Topic: EFFICIENCY**

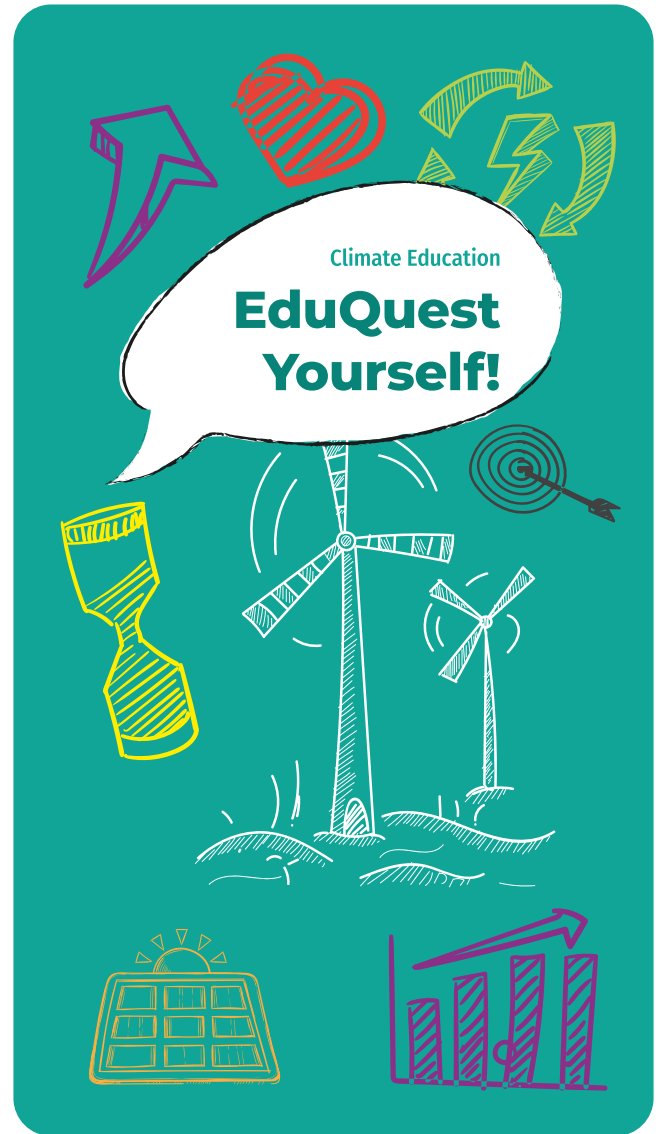
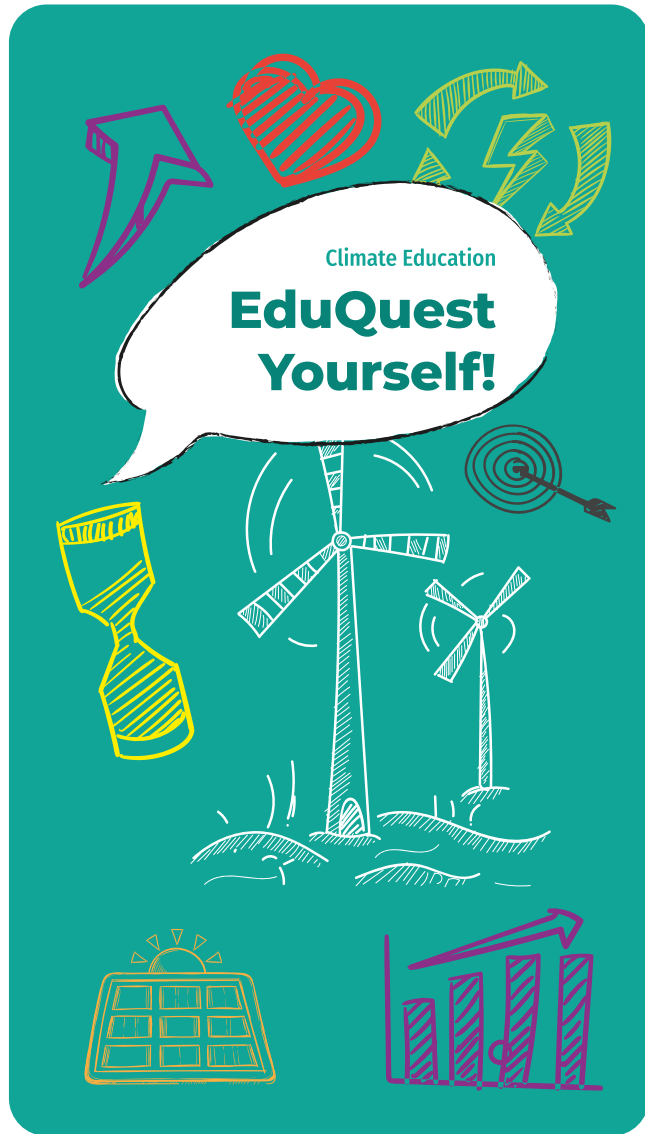
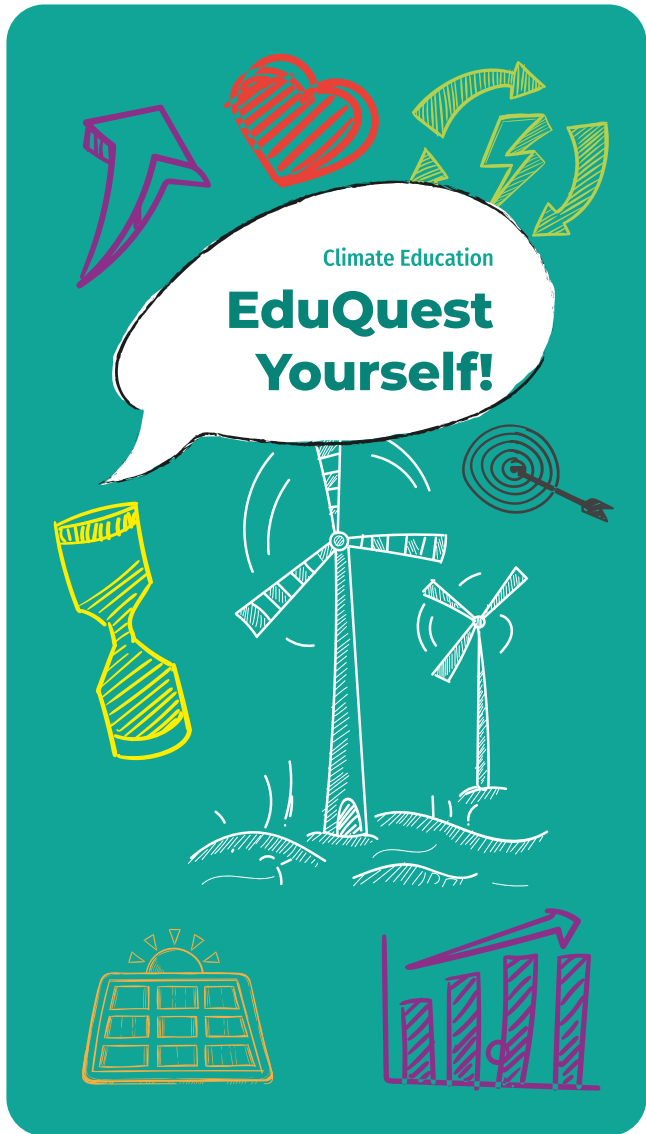
**SMOG**

1. I'm an effect.
2. I occur in heavy air pollution and adverse atmospheric conditions.
3. I like polluting materials (sulfur dioxide, carbon monoxide, nitrous oxides, etc.)
4. Laymen may confuse me with fog.
5. I have two types: the London type and the Los Angeles type.
6. I increase respiratory diseases.
7. If you hear my alarm, stay indoors.
8. Burning coal (like in London, with carbon monoxide and dust) or heavy traffic in sunny weather (like in Los Angeles, with nitrous oxides, carbon monoxide, and hydrocarbons) can bring me to life.
9. My concentration in the atmosphere by itself doesn't come with pre-programmed measures because those depend on the size of the area and the duration.
10. I'm defined by the threshold of air pollutants, and emergency/contingency plans are put in place for my sake.

**Topic: EFFICIENCY**

**SOLAR COLLECTOR**

1. I use the Sun's power.
2. I make heat and hot water.
3. One of the forms I can take is the garden shower with the black container.
4. You can also make my tubes from beer cans.
5. I rest when the weather is cold.
6. I'm good for temporary heating in the spring and autumn and additional heating in the winter.
7. Depending on my size I can provide domestic hot water and heating.
8. I work together with heat exchangers.
9. I utilize renewable energy and don't pollute the earth much.
10. My panels have tubes full of liquid running through them.



# A game of questions and answers

**Topic: EFFICIENCY**

**SOLAR PANEL**

1. I feed on the Sun's electromagnetic radiation.
2. I create direct currents.
3. I'm also known as a photovoltaic (PV) cell.
4. People build fields from me.
5. My energy source knows no bounds.
6. I rest when the weather is cold.
7. We make a good team with other renewable energy users.
8. You can find me on rooftops.
9. Optimal tilt and orientation are key for my installation.
10. I, unfortunately, need silicon to live, which can only be mined in an environmentally damaging way.

**Topic: EFFICIENCY**

**WIND TURBINE/  
WIND MILL/WIND FARM**

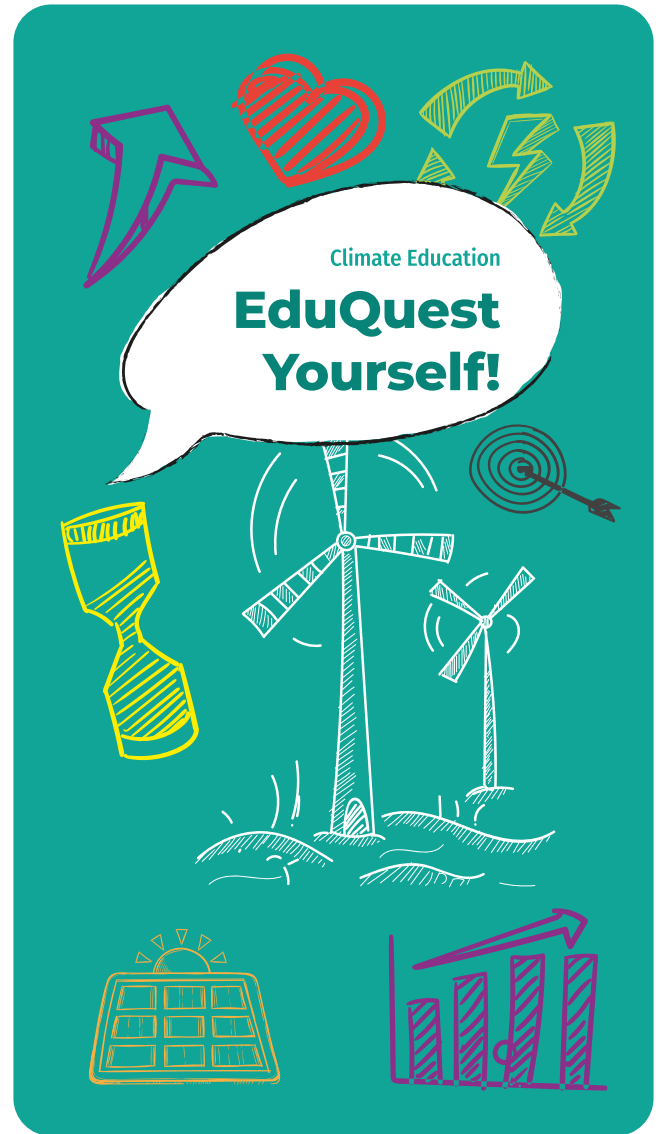
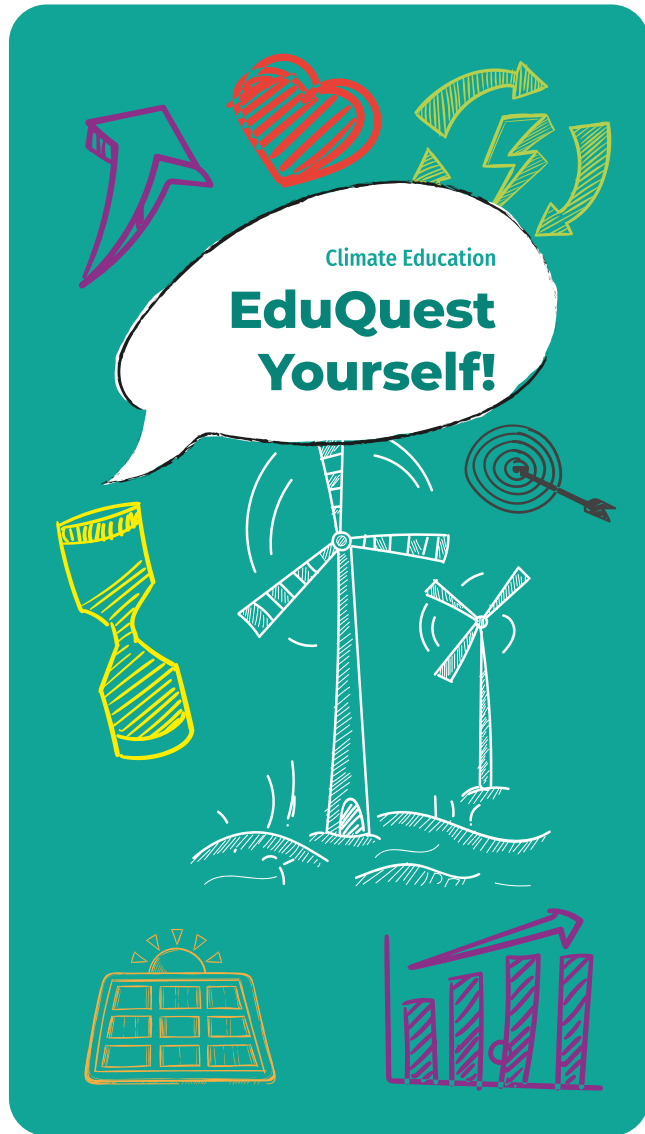
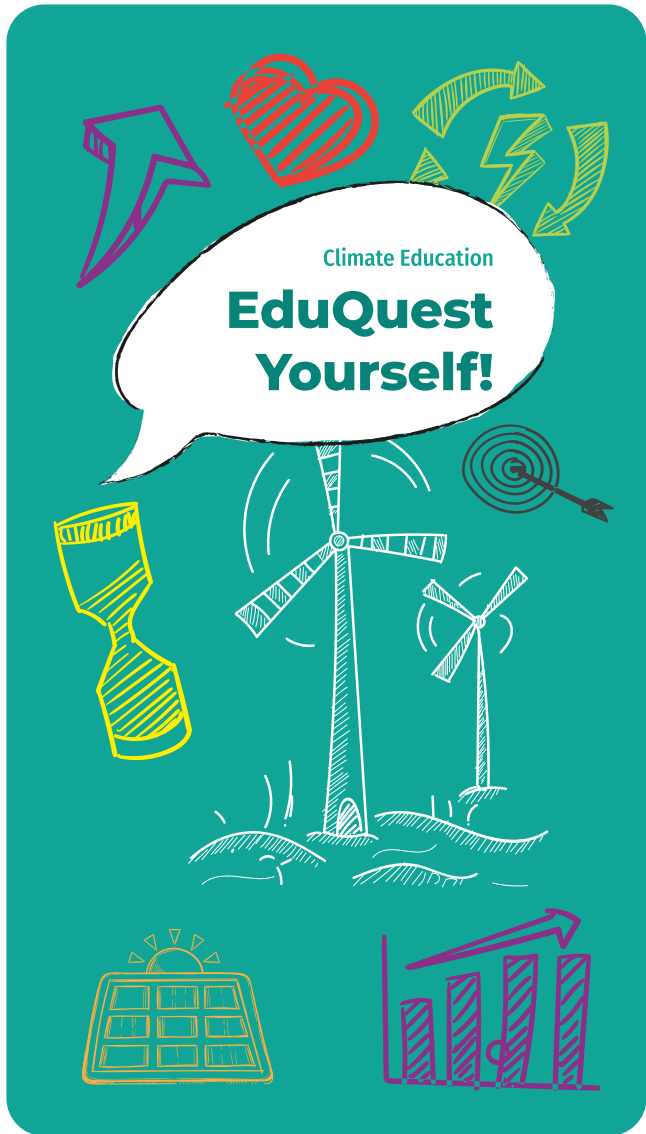
1. My axis can be vertical or horizontal.
2. I spin but don't get dizzy.
3. I rest when the wind doesn't blow.
4. I use renewable and infinite energy.
5. The birds don't like when I stand in their way.
6. My beauty isn't without dispute. Some think I'm beautiful but others claim I'm a blemish on the Earth.
7. I stand inside the Eiffel Tower with a vertical axis.
8. If I'm deconstructed, almost all of my components can be reused.
9. I like being on farmlands.
10. I especially like being on coastlines (I'm often built there in large amounts).

**Topic: EFFICIENCY**

**THERMOSTAT**

1. I regulate heating.
2. You can control me with buttons or dials.
3. I come with a variety of programs and even remote controls.
4. My location inside a building is crucial.
5. When my battery is low, I can make your heating go crazy.
6. I send signals.
7. I'm sensitive to the room's temperature.
8. I communicate with the boiler.
9. I don't like living right next to a window, a door, or a radiator.
10. The best is if you keep me around 21 °C.





## CLIMATE CHANGE

## Questions

**1.** The population of our planet has increased by more than two and a half times since the 1960-s. Our footprint is too big! Let us consider that we have to produce more food, use more transport (just to mention a few examples), which all burden the resources of the Earth. What do you call this quick growth in population? Solve the anagram!

BAMBOO BY

- a. baby boom
- b. population growth
- c. social growth



**2.** Carbon-dioxide (CO<sub>2</sub>) emitted by humans is responsible for 80% of global warming, and transport is a major contributor to this. How much carbon dioxide can you save by walking or cycling to school or work instead of driving?

- a. Two big trees can save you a whole year's work.
- b. 1 houseplant sequesters this amount of CO<sub>2</sub> a week.
- c. We do not save anything by this.



**3.** Every year, 2-3 species become extinct naturally. Due to the scale of human activity, such as deforestation for the need of land for food production, or building on more and more land, the extinction of species has taken an incredible extent.

How many species do we lose annually because of human activities?

- a. approximately 100
- b. approximately 1000
- c. Approximately one thousand times more species go extinct than the natural rate of extinction



**4.** The majority of the plants we eat, 70% in total, require pollinators. Besides many vegetables and fruits, the material of some of our clothes also comes from these insects.

Which of the following foods should we give up if pollinators disappear?

- a. Chocolate
- b. Pop corn
- c. Bread

**5.** During our life, we grow accustomed to a certain lifestyle. Buying certain products is quite natural. We cannot imagine our lives without some of them like toilet paper.

How many trees do we have to cut down to produce toilet paper?

- a. One thousand trees a day.
- b. Five thousand trees a day.
- c. 27 thousand trees a day.



**6.** Our money is also our vote! When we buy a product, we also decide what goes on the shelves and what the farmer produces. From the products below, which one is the best choice in terms of the environment?

- a. cow milk
- b. oat milk
- c. orange juice



# Quizzes - Questions

7. What label indicates if a product is fair trade?



- a. Label "A" indicates that a product is a fair trade product.
- b. Label "B" indicates that a product is a fair trade product.
- c. Label "C" indicates that a product is a fair trade product.

8. What is the European Eco-label used to indicate environmentally friendly products?

- a. tree
- b. leaf
- c. flower

9. Meat production requires a lot of water, including drinking water for animals and water for growing the crops for food. How much water is needed to produce 1 beef patty?

- a. 1 bathtub of water.
- b. 10 bathtubs of water.
- c. 1 glass of water.



10. What percentage of the planet's water is freshwater?

- a. 71% of the surface of the Earth is water, this is why it is called the blue planet.
- b. Fresh water is only 3% of the Earth's water supply.
- c. Only 0.5% of the Earth's water supply is drinkable.



11. Our biggest treasure is clean water. Today almost 50 countries struggle with water shortage, and 36% of humanity is living in water scarce areas. Water is also necessary to manufacture products. How much water is needed when we want to drink a glass of orange juice?

- a. The water content of 3 oranges.
- b. To produce 1 glass of orange juice, 50 liters of water is needed.
- c. To produce 1 glass of orange juice, 170 liters of water is needed.

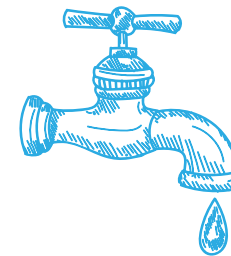
12. Let's pour clean water in the glass! Water is essential for the human body. Since the 1970s it has been sold as mineral water in plastic PET bottles. Today, in our country, an average of 150 PET bottles per person are sold every year, which is a lot of unnecessary waste. From the following, which is the best for our health?

- a. bottled mineral water
- b. tap water
- c. bottled mineral water with vitamins



13. Dangerous levels of microplastics have been found in the remains of sea turtles that died shortly after hatching, according to researchers at the University of Florida. How much microplastics was recovered from a 48-gram turtle?

- a. 56 plastic particles
- b. 359 plastic particles
- c. 287 plastic particles



## Quizzes - Questions

**14.** The microplastic pollution of the Tisza and its tributaries is significant. How many particles of microplastics were found in 1 kg of coastal sediment?

- a. 3200
- b. 356
- c. 1050



**15.** Selective waste collection is a great way to reduce municipal solid waste. Which types of waste cannot be recycled indefinitely?

- a. metal
- b. glass
- c. plastic



**16.** The best way to recycle kitchen waste is composting! Which of the following can go into compost?

- a. eggshells
- b. cooking oil
- c. peel of exotic fruits

**17.** Can we compost in an urban environment?

- a. No, because it smells and attracts unwanted animals.
- b. Yes, we can, however it is worth discussing it with the neighbors first, and if they oppose composting, there are other options to collect kitchen waste separately.

**18.** Which of the following foods is the best choice for the environment?

- a. domestically produced apple
- b. Hohes C apple juice
- c. Apple from Spain.



**19.** Nowadays, a wide variety of exotic fruits and vegetables are available on the shelves of the shops. There are even some produced in Hungary that can be bought at any time, outside it's the natural season. Such as Spanish tomatoes or Dutch apples. The transport of these products is responsible for a lot of CO<sub>2</sub> emissions. Which product won the "Devil's Stone award" for the most absurd and environmentally harmful product in 2020?

- a. Bottled water from the melted Greenland glaciers.
- b. Avocado cream from Mexico, processed in Egypt.
- c. Tinned kangaroo from Australia.



**20.** Do you leave your electronic devices in standby mode e.g. TV? How much energy does it use in standby?

- a. You can charge your phone with it in 3-4 hours.
- b. You can charge your phone with it during the night.
- c. You can charge your phone with it in 1-2 days.



# Quizzes - Questions

21. In which picture is the ermine?



- a. We can see an ermine in the picture on the left.
- b. We can see an ermine in the picture on the right.
- c. We can see an ermine in both pictures.

## CLIMATE CHANGE

### Solutions

**1. The population of our planet has increased by more than two and a half times since the 1960-s. Our footprint is too big! Let us consider that we have to produce more food, use more transport (just to mention a few examples), which all burden the resources of the Earth.**

**What do you call this quick growth in population? Solve the anagram!**

**bamboo by**

- a. baby boom
- ~~b. population growth~~
- ~~c. social growth~~

**Background information:** How many people can be sustained by the Earth? According to calculations, to sustain our present lifestyle more than 1.5 Earths would be necessary, however, we only have 1 Earth. Population is growing steadily, and everyone would like to live on the standard as those in developed countries, therefore humanity uses more and more resources, which has obvious impacts. Global climate change is such an impact.

**Eco tip:** In your everyday life, you can choose from several more sustainable alternatives, when you change your transport or shopping habits for example.

**2. Carbon-dioxide (CO<sub>2</sub>) emitted by humans is responsible for 80% of global warming, and transport is a major contributor to this.**

**How much carbon dioxide can you save by walking or cycling to school or work instead of driving?**

- a. Two big trees can save you a whole year's work.
- ~~b. 1 houseplant sequesters this amount of CO<sub>2</sub> a week.~~
- ~~c. We do not save anything by this.~~

**Background information:** You can decrease your CO<sub>2</sub> emissions not only by your conscious transportation. Think about foreign products which travel several 100 thousands of kilometers, e.g. exotic fruit from Mexico.

**Eco tip:** Buy local and seasonal products, this is not only good for the planet, but for your health as well.

**3. Every year, 2-3 species become extinct naturally. Due to the scale of human activity, such as deforestation for the need of land for food production, or building on more and more land, the extinction of species has taken an incredible extent.**

**How many species do we lose annually because of human activities?**

- ~~a. approximately 100~~
- ~~b. approximately 1000~~
- c. Approximately one thousand times more species go extinct than the natural rate of extinction

**Background information:** Nature is a very complex system, if one or two species go extinct, it is not a huge problem, as the system more or less replaces their absence with other species and adapts. However, the system is not able to adapt to the quick extinction of species, which in turn threatens with the collapse of the system.

**Eco tip:** Pay attention to the packaging of goods and do not buy anything with palm oil in it!

Everything is connected to everything, and with the deforestation of rainforests, many species go extinct. However, you may have not considered yet that the extinction of species also affects us, as a significant part of our produced food depends on pollination!

# Quizzes - Solutions

**4. The majority of the plants we eat, 70% in total, require pollinators. Besides many vegetables and fruits, the material of some of our clothes also comes from these insects. Which of the following foods should we give up if pollinators disappear?**

- a. Chocolate
- ~~b. Pop-corn~~
- ~~c. Bread~~

**Background information:** Man is farming in vast areas, while cities are also sprawling. Pollinating insects find food with difficulty, but you can help them!

**Eco tip:** Plant beautiful, flourishing plants in your home, which provides food for pollinating insects.

**5. During our life, we grow accustomed to a certain lifestyle. Buying certain products is quite natural. We cannot imagine our lives without some of them like toilet paper.**

**How many trees do we have to cut down to produce toilet paper?**

- ~~a. One thousand trees a day.~~
- ~~b. Five thousand trees a day.~~
- c. 27 thousand trees a day.

**Background information:** Today the annual paper consumption of the world is approximately 310,000,000 tons, and the paper industry uses almost two thousand types of chemicals. The increasing paper consumption uses more and more raw material (wood), energy and water. One ton of paper is produced by using three tons of paper, while the same amount of energy is used for it as an average household in a year. At present, paper production uses 20% of the annual logging in the world.

**Eco tip:**

- Choose a more sustainable alternative, use toilet paper made of recycled paper!
- If you print something, think twice whether it is really necessary.

**6. Our money is also our vote! When we buy a product, we also decide what goes on the shelves and what the farmer produces. From the products below, which one is the best choice in terms of the environment?**

- ~~a. cow milk~~
- b. oat milk
- ~~c. orange juice~~

**Background information:** By choosing certain products we can do a lot for the Earth. Transporting goods Greenhouse gas emissions could decrease by even 80%, if you chose oat milk instead of cow milk.

**Eco tip:** You can see several labels on the shelves of the stores which help you to make a good decision.

**7. What label indicates if a product is fair trade?**



- a. Label "A" indicates that a product is a fair trade product.
- ~~b. Label "B" indicates that a product is a fair trade product.~~
- ~~c. Label "C" indicates that a product is a fair trade product.~~

**8. What is the European Eco-label used to indicate environmentally friendly products?**

- ~~a. tree~~
- ~~b. leaf~~
- c. flower

**9. Meat production requires a lot of water, including drinking water for animals and water for growing the crops for food. How much water is needed to produce 1 beef patty?**

- a. ~~1 bathtub of water.~~
- b. 10 bathtubs of water.
- c. ~~1 glass of water.~~

**Eco tip:** Decrease your meat consumption! If you leave out meat from your diet once a week, you have already done much for the environment.

**10. What percentage of the planet's water is freshwater?**

- a. ~~71% of the surface of the Earth is water, this is why it is called the blue planet.~~
- b. Fresh water is only 3% of the Earth's water supply.
- c. ~~Only 0.5% of the Earth's water supply is drinkable.~~

**Background information:** As you can see, only a small percentage of the water base of the Earth is suitable for human consumption, and 80% of it can be found in the Arctic ice, therefore it is essential to save it.

**Eco tip:** Do not bathe in the bathtub, but shower instead! Besides drinking water used by us, huge amounts of water are needed for our usual everyday activities and the manufacturing of products.

**11. Our biggest treasure is clean water. Today almost 50 countries struggle with water shortage, and 36% of humanity is living in water scarce areas. Water is also necessary to manufacture products. How much water is needed when we want to drink a glass of orange juice?**

- a. ~~The water content of 3 oranges.~~
- b. ~~To produce 1 glass of orange juice, 50 liters of water is needed.~~
- c. To produce 1 glass of orange juice, 170 liters of water is needed.

**Eco tip:**

- Instead of buying orange juice, you can also make your juice!
- By this, you can not only save water, but also decrease CO<sub>2</sub> emitted by transportation.
- If you make orange juice yourself, you can even save packaging, thus saving the environment.

**12. Let's pour clean water in the glass! Water is essential for the human body. Since the 1970s it has been sold as mineral water in plastic PET bottles. Today, in our country, an average of 150 PET bottles per person are sold every year, which is a lot of unnecessary waste. From the following, which is the best for our health?**

- a. ~~bottled mineral water~~
- b. tap water
- c. ~~bottled mineral water with vitamins~~

**Background information:** Within ten years, average mineral water consumption increased from 20 liters per person to 1 hectoliters (100 liters), which means a lot of unnecessary waste. Tap water in the great majority of the country is much healthier and cheaper than prepackaged drinks and mineral water. Besides mineral water in plastic bottles is not only bad for the environment, but for our health as well. During storage (in hot weather in summer, and in cold weather in winter) harmful substances are freed from plastic, such as phtalat, antimony trioxide, DEHP.

**Eco tip:**

- Choose tap water instead, or if you have a water filtering jug or water filter in your home is the best, with this, you can save a lot of waste for the environment.
- Take a refillable bottle with you!



**13. Dangerous levels of microplastics have been found in the remains of sea turtles that died shortly after hatching, according to researchers at the University of Florida.**

**How much microplastics was recovered from a 48-gram turtle?**

- a. 56 plastic particles
- ~~b. 359 plastic particles~~
- c. 287 plastic particles

**Background information:** The primary source of plastic waste in the oceans is the land, for instance landfills and factories. Annually almost 11 million tons of plastic gets into the oceans, and by 2040 this amount is predicted to increase by three times, reaching 29 million tons.

**14. The microplastic pollution of the Tisza and its tributaries is significant. How many particles of microplastics were found in 1 kg of coastal sediment?**

- a. 3200
- ~~b. 356~~
- ~~c. 1050~~

**Background information:** Microplastic is a plastic part smaller than 5 mm, which gets into the environment. It can get into nature in two ways, one is from washing clothes made of synthetic materials and cosmetics, the other is by the physical fragmentation of plastic waste in the environment (e.g. car tires, insulations).

**Eco tip:**

- When you go shopping, take your canvas bag and buy less packaged products.
- Choose products which are not over packaged!
- Do not forget, instead of recycling a much better alternative is not to produce any waste.

**15. Selective waste collection is a great way to reduce municipal solid waste. Which types of waste cannot be recycled indefinitely?**

- ~~a. metal~~
- ~~b. glass~~
- c. plastic

**Background information for questions 17. and 18.:** It is a general rule when plastic is recycled that after each recycling the quality of the given plastic deteriorates, and after 2 or 3 occasions it cannot be recycled further. To strengthen the quality of recycled plastic, usually “virgin” plastic is added to the mix.

**Eco tip:**

- If we separate them wisely, excellent products can be made of waste, e.g. a jumper, toilet paper or a bicycle!
- Other garbage does not have to end in communal waste either! What shall happen to green waste?

**16. The best way to recycle kitchen waste is composting! Which of the following can go into compost?**

- a. eggshells
- ~~b. cooking oil~~
- ~~c. peel of exotic fruits~~

**Eco tip:**

- Compost at home, and your plants will be grateful!
- You can decrease your household waste significantly when you compost!

## 17. Can we compost in an urban environment?

- a. — No, because it smells and attracts unwanted animals.
- b. Yes, we can, however it is worth discussing it with the neighbors first, and if they oppose composting, there are other options to collect kitchen waste separately.

**Background information for questions 19. and 20.:** 58.8% of household waste in Hungary is placed in landfills, although almost 25-30% of household waste (800,000 tons) is made of biologically degradable waste, which can be recycled as compost and turned into valuable organic fertilizer.

We have several options for community composting. We can take our kitchen waste to the compost station in Humusz Ház, or the garden of the Herman Ottó Institute, which is open for inhabitants of the 20th district, or in some of the community gardens of the Contemporary Architecture Centre we can also compost. Another advantage of community composting is that at these stations we can also take home from the ready compost full of nutrients and we do not have to buy soil for our plants.

## 18. Which of the following foods is the best choice for the environment?

- a. domestically produced apple
- b. — Hohes C apple juice
- c. — Apple from Spain.

**Background information:** Carbon dioxide and other gases emitted into the air when food is being transported are responsible for global climate change.

### Eco tip:

- Check where the product comes from!
- Prefer local products!

## 19. Nowadays, a wide variety of exotic fruits and vegetables are available on the shelves of the shops. There are even some produced in Hungary that can be bought at any time, outside it's the natural season. Such as Spanish tomatoes or Dutch apples. The transport of these products is responsible for a lot of CO<sub>2</sub> emissions. Which product won the "Devil's Stone award" for the most absurd and environmentally harmful product in 2020?

- a. Bottled water from the melted Greenland glaciers.
- b. — Avocado cream from Mexico, processed in Egypt.
- c. — Tinned kangaroo from Australia.

**Background information for questions 21. and 22.:** Some products travel more than necessary, although we could buy them at home. For instance, garlic from Asia travels a lot unnecessarily. This destroys the climate, as its transportation emits lots of carbon dioxide, which increases climate change. In addition, food produced locally gives work to many farmers, and Hungarian garlic tastes better.

**Eco tip:** During your everyday life, you can save the environment not only by shopping consciously, but by other small actions as well. For instance, you can save energy!

## 20. Do you leave your electronic devices in standby mode e.g. TV? How much energy does it use in standby?

- a. You can charge your phone with it in 3-4 hours.
- b. — You can charge your phone with it during the night.
- c. — You can charge your phone with it in 1-2 days.

**Background information:** In standby mode, the appliance consumes electricity. With the help of this function you can switch on the appliance easily at any time, with a remote control. However, many appliances consume unnecessarily much electricity in standby mode, and they stay in standby mode in spite of the fact that we do not use them for a long time.

**Eco tip:** Disconnect your appliance after use!

21. In which picture is the ermine?



- a. We can see an ermine in the picture on the left.
- b. We can see an ermine in the picture on the right.
- c. We can see an ermine in both pictures.

**Background information:** Animals and plants adapted to their environment. The color of the ermine's fur adapts to the season, his fur, which is brown in summer, turns white in winter. Animals and plants can adapt to changes well, however processes started by mankind accelerated these processes and the ecosystem cannot adapt at this rate anymore.

**WE CAN ALREADY FEEL THE IMPACTS OF GLOBAL CLIMATE CHANGE. SAY EXAMPLES!**

Thank you for playing with us! In the following, let us see how we can make more sustainable decisions in our everyday lives!

## SHOPPING

### Questions

**1. Which product is available from Fair Trade sources?**

- a. cocoa
- b. tea
- c. coffee
- d. banana

**2. Which product travels the longest (which one has the biggest CO<sub>2</sub> footprint)? Put them in order, starting with the one coming from the furthest!**

- a. Slovakian milk
- b. Argentinian beef
- c. apple from Szabolcs county, Hungary
- d. Chinese garlic

**3. What logo can be seen on products coming from Fair Trade sources?**

**4. What is agro-ecology?**

- a. A special field of agricultural science
- b. An approach in which being soft to nature and protecting people becomes part of farming.
- c. A farm, which considers economy factors most important.
- d. A farming method experimented based on permaculture and biodynamic farming.

**5. Which one is the odd one out?**

- a. organic product

- b. product from ecological farming
- c. demeter product
- d. ecological product

**6. Which product is the most environmentally friendly, which would you prefer to put in your shopping basket if you wanted to buy „green”? Start with the best and end up with the one you wouldn't buy if possible.**

- a. Organic apples from Austria, packaged on a tray, foiled
- b. Organic cheese from Balmazújváros, Hungary, in a plastic bag
- c. Organic canned tuna
- d. Organic bread from the bakery next door
- e. Fair Trade banana from Ecuador

**7. Which one is true to Fair Trade? (there is more than one correct answer)**

- a. Producers receive wages for their work which allows them a decent living.
- b. They do not use child labor during production
- c. During production, they adhere to ecological regulations
- d. In this labelling system you can even buy sports balls

**8. Guess how many varieties of propagating material and seeds are kept in the Tapiószele seed bank of Hungary?**

**9. Which plants do tomatoes like, and what should they be planted next to?**

- a. Beans
- b. Onions
- c. Tomatoes
- d. Eggplant
- e. Basil
- f. Potatoes

**10. List 3 purple vegetables!**

# Attachment - Simple Games - Shopping Quizzes - Solutions

1.3

## SHOPPING Solutions

### 1. Which product is available from Fair Trade sources?

- a. cocoa
- b. tea
- c. coffee
- d. banana

All of them!

### 2. Which product travels the longest (which one has the biggest CO<sub>2</sub> footprint)? Put them in order, starting with the one coming from the furthest!

- b. Argentinian beef (approx. 12 thousand km)
- d. Chinese garlic (approx. 7500 km)
- a. Slovakian milk
- c. apple from Szabolcs county, Hungary

### 3. What logo can be seen on products coming from Fair Trade sources?



### 4. What is agro-ecology?

- a. A special field of agricultural science
- b. An approach in which being soft to nature and protecting people becomes part of farming.
- c. A farm, which considers economy factors most important.
- d. A farming method experimented based on permaculture and biodynamic farming.

### 5. Which one is the odd one out?

- a. organic product
- b. product from ecological farming
- c. demeter product
- d. ecological product

None of them!

### 6. Which product is the most environmentally friendly, which would you prefer to put in your shopping basket if you wanted to buy „green”? Start with the best and end up with the one you wouldn't buy if possible.

- a. Organic apples from Austria, packaged on a tray, foiled 3.
- b. Organic cheese from Balmazújváros, Hungary, in a plastic bag 2.
- c. Organic canned tuna 5.
- d. Organic bread from the bakery next door 1.
- e. Fair Trade banana from Ecuador 4.

### 7. Which one is true to Fair Trade? (there is more than one correct answer)

- a. Producers receive wages for their work which allows them a decent living.
- b. They do not use child labor during production
- c. During production, they adhere to ecological regulations
- d. In this labelling system you can even buy sports balls

All of them are true!

### 8. Guess how many varieties of propagating material and seeds are kept in the Tapiószele seed bank of Hungary?

More than 100 thousand samples

# Attachment - Simple Games - Shopping

## Quizzes - Solutions

1.3

9. Which plants do tomatoes like, and what should they be planted next to?

- a. Beans
- b. Onions
- c. Tomatoes
- d. ~~Eggplant~~
- e. Basil
- f. ~~Potatoes~~

10. List 3 purple vegetables!

e.g. red onions, eggplant, kohlrabi, red cabbage, dry beans, purple potatoes

# Attachment - Simple Games - Sustainability

## Quizzes - Questions

1.3

### SUSTAINABILITY - QUESTIONS

1. Approximately how long does it take for a plastic bottle to degrade?

- a. more than 300 years
- b. more than 1 000 years
- c. more than 20 000 years



2. Approximately how long does it take for a piece of paper to degrade?

- a. 1-2 months
- b. 2-5 months
- c. 1 year



3. How much water does an average person use a day?

- a. 110 liters
- b. 150 liters
- c. 170 liters

4. How much water is needed to produce one kilogram of beef?

- a. 1 000 liters
- b. 10 000 liters
- c. 100 000 liters

5. How many liters of drinkable water is available for a person in Africa (with cooking, washing, etc. included)?

- a. 5 liters
- b. 50 liters
- c. 70 liters

6. How large an island of plastic bottles, lighters and caps is floating in the North Pacific Ocean?

- a. The size of Slovakia (approx. 50 000 km<sup>2</sup>)
- b. The size of Estonia (approx. 45 400 km<sup>2</sup>)
- c. The size of Mongolia (approx. 1.5 km<sup>2</sup>)

7. If every person in the world lived like an average Hungarian, how many Earths would we need to supply them?

- a. 1.0
- b. 2.2
- c. 1.3
- d. 0.8

8. If every person in the world lived like an average US citizen, how many Earths would we need to supply them?

- a. 10.1
- b. 5.2
- c. 2.5
- d. 7.5

9. Which country in the world has the highest carbon dioxide emissions per capita?

- a. The USA
- b. China
- c. India
- d. Canada

10. Which of the following uses the most water (=water footprint)?

- a. One liter of milk
- b. A cotton T-shirt
- c. Hamburger
- d. 1 piece of apple, produced in Hungary

# Attachment - Simple Games - Sustainability

## Quizzes - Solutions

1.3

### SUSTAINABILITY - SOLUTIONS

1. Approximately how long does it take for a plastic bottle to degrade?

- a. more than 300 years
- b. more than 1 000 years**
- c. more than 20 000 years

2. Approximately how long does it take for a piece of paper to degrade?

- a. 1-2 months**
- b. 2-5 months
- c. 1 year

3. How much water does an average person use a day?

- a. 110 liters**
- b. 150 liters
- c. 170 liters

4. How much water is needed to produce one kilogram of beef?

- a. 1 000 liters**
- b. 10 000 liters
- c. 100 000 liters

5. How many liters of drinkable water is available for a person in Africa (with cooking, washing, etc. included)?

- a. 5 liters (while an average Hungarian 170 liters!)**
- b. 50 liters
- c. 70 liters

6. How large an island of plastic bottles, lighters and caps is floating in the North Pacific Ocean?

- a. The size of Slovakia (approx. 50 000 km<sup>2</sup>)**
- b. The size of Estonia (approx. 45 400 km<sup>2</sup>)
- c. The size of Mongolia (approx. 1.5 km<sup>2</sup>)

7. If every person in the world lived like an average Hungarian, how many Earths would we need to supply them?

- a. 1.0**
- b. 2.2
- c. 1.3**
- d. 0.8

8. If every person in the world lived like an average US citizen, how many Earths would we need to supply them?

- a. 10.1**
- b. 5.2
- c. 2.5**
- d. 7.5

9. Which country in the world has the highest carbon dioxide emissions per capita?

- a. The USA**
- b. China
- c. India
- d. Canada

10. Which of the following uses the most water (=water footprint)?

- a. One liter of milk**
- b. A cotton T-shirt
- c. Hamburger
- d. 1 piece of apple, produced in Hungary



# Situation games - Meat consumption

## Dear Group,

You will have the following task: you have to play a situation about meat consumption!

In this situation, you have to persuade the principal to introduce a meat-free day a week in the canteen. Distribute the roles of the principal and the students. Read the description you received and check out the graphs, then play an imagined conversation with your “principal” and try to persuade them to introduce a meat-free day a week!

You have 20 minutes to prepare for the short play, then 5 minutes to present it. In the evaluation, we will take into consideration what information was integrated into your play and how well you delivered your argument. You can use your notes when you are presenting however you are not supposed to read them out! If you want more people can present the scene or even all of you

**You will be the third group presenting your situation. Good luck!**

## Meat consumption

**Health effects:** in Hungary, we consume too much meat and fat mostly of animal origin, while we eat too few vegetables and fruits. As a result, in Hungary **cardiovascular diseases** are leading death causes, and many people struggle with **other diseases and obesity**.



**Environmental protection:** 75% of arable land on Earth is used for animal breeding. This is one drive behind the **deforestation of rainforests**, which contributes significantly to the increase of greenhouse gas emissions. On the huge, intensive tables farming is pursued by using vast amounts of **artificial fertilizers and herbicides**, part of which is not used by the plants but **get into the air and groundwater as pollution**. Besides artificial fertilizers, **organic and slurry** produced during animal husbandry also **has a significant impact on the environment**. Besides, and not limited to the aforementioned factors, we would like to mention the significant **need of water** necessary for animal breeding and meat production. 70% of the water reserve of the world is used by agriculture, one third of which is connected to animal husbandry.



**Animal rights protection, animal welfare:** at the huge animal farms the animals are often kept in confined spaces, where they cannot exercise their natural forms of behavior, while young animals are most often not bred near their mothers, but **separate** them. Animals often **do not see natural sunlight** during their whole life, and they are often **mutilated**. Animals kept in industrial circumstances, bred at a forced rate for profit optimization are more prone to diseases, therefore in many animal farms the **preventive use of antibiotics is common**. Besides being an unnecessary burden for animals, this practice may contribute to the growth of **antibiotic-resistant germs**, while antibiotics can also **appear in the products made for consumption**.

## Dear Group,

You will have the following task: you have to play a situation about waste!

In the play, you have to write a quiz during a lesson, and you would like to avoid wasting paper. Choose the roles of the teacher and students. Read the description you received and check out the graph, then play an imagined conversation with your “teacher” and try to persuade them to make you write the quiz this time on already used paper!

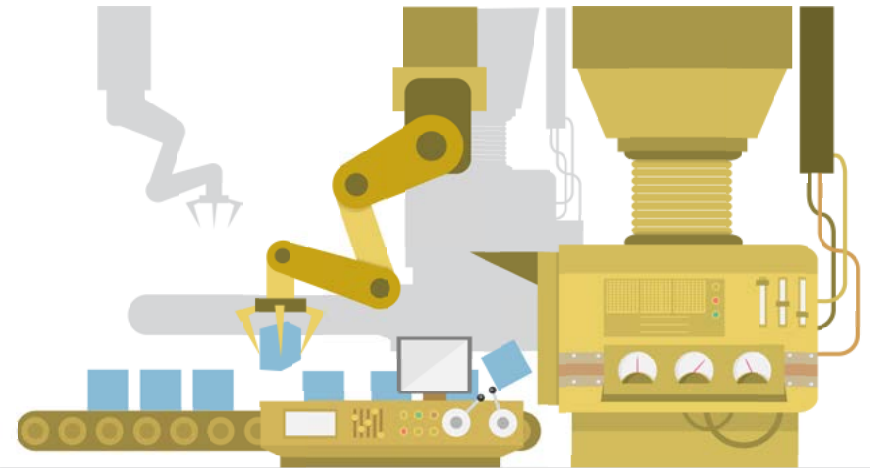
You have 20 minutes to prepare for the short play, then 5 minutes to present it. In the evaluation, we will take into consideration what information was integrated into your play and how well you delivered your argument. You can use your notes when you are presenting however you are not supposed to read them out! If you want more people can present the scene or even all of you!

**You will be the fourth group presenting your situation. Good luck!**

## Waste and paper use

Collecting waste separately is very important. The problem is when we produce waste again and again, wasting energy, raw materials, the power of our Earth unnecessarily, and we burden our environment.

The situation is typical in the case of paper. Although the 21st century would allow minimizing paper use, however this is not what happens. On the contrary! We slowly drown in paper waste, **every day paper of the equivalent of approximately 270 000 trees lands in landfills** and in canals. In Hungary, annually and per person we produce about 95-100 kilograms of paper waste.



**To produce paper**, a vast amount of energy is needed. To produce one kilo of traditional paper 2-3 kilos of wood, 45-55 liters of water, 10-12 kWh of energy and loads of chemicals are needed. Our Earth loses every year forests with a size equivalent of the country of Greece!

We can avoid unnecessary deforestation and creating paper waste unnecessarily if we use paper several times, use recycled paper or collect this type of waste for recycling. However, we must not forget that **even the production of recycled paper needs much energy!**

In the paper industry they often see it as an environmentally friendly option not to cut down old forest, but to plant new ones. However, it is not a good method, as these newly planted monocultures often drive out indigenous plants and animals, and also a vast amount of herbicides and artificial fertilizers are needed to sustain them.

Source: <https://ng.24.hu>; <http://ecolounge.hu>; <https://harmonet.hu>

# Situation games - Waste and paper use

Paper once used to be a rare and valuable item, originally developed for communication purposes, however today it is present in your lives everywhere, from paper towels to wallpaper, and it is mostly used as packaging. Unfortunately, the majority of a huge amount of paper waste ends up in landfills. With a little attention and selection you can improve the situation a lot.

### Did you know?

It takes 2-5 months for paper to degrade in the soil, however it does not degrade at all at landfills, as due to compacting of waste there is no air and light, and often not enough humidity, which would be necessary for the operation of the organisms performing degradation.

The lungs of the Earth are shrinking! 3/4 of the increase in CO<sub>2</sub> emissions is caused by deforestation! Deforestation is one of the biggest environmental problems we have to face today.

Forests, similarly to the ocean transform carbon dioxide to oxygen, and give home to the majority of the biodiversity in the world. 17 million hectares of forest are cut down each year. About 20% of the trees cut down get to the paper mills. As a result of deforestation, vivid forest life is killed, and it is slowly replaced by barren land.



IF TREES COULD EMIT WI-FI SIGNALS,  
WOULD WE PLANT MORE TREES?



We cannot only speak about mass deforestation, but sometimes about large-scale tree planting as well: In 2017, in India in a single day 66 million trees were planted!

# Situation games - Electronic devices

## Dear Group,

You will have the following task: you have to play a situation about electronic devices!

In this situation game, one of you would like a new mobile, although your previous device is only a year old. The others must dissuade the person from buying a new phone. Read the description you received and check out the graph, then play an imagined conversation about the topic!

You have 20 minutes to prepare for the play, then 5 minutes to present it. In the evaluation, we will take into consideration what information was integrated into your play and how well you delivered your argument. You can use your notes when you are presenting, however, you are not supposed to read them out! If you want more people can present the scene or even all of you!

**You will be the first group presenting your situation. Good luck!**

## Electronic devices

**Coltan is a mineral, of which the metal tantalum** is produced. Tantalum is a very rare metal. It is indispensable for the production of electronic devices. 80 per cent of the coltan stock of the world can be found in Africa, in the Republic of the Kongo. Due to the booming demand for smartphones and laptops, between 1990 and 2000 coltan mining grew by five times, and by today, even ten more times is not sufficient.

The circumstances of mining are life-threatening: in the mines of the Kongo 150 thousand **workers** are employed, many of them are children. Poverty forces them to work for peanuts, in dust destroying their lungs and eyes.



Exploitation causes irreversible **damage to the environment**. The waste of mines is often full of heavy metals and chemicals, which severely pollute the soil and waters. People living in the proximity of the mines, who used to make ends meet from growing vegetables cannot produce food suitable for human consumption anymore. In the meantime, the operators of the mines make huge profits, **the miners cannot make enough money during their long shifts to buy enough pharmaceuticals and food for themselves and their families**.

To exploit the minerals and construct roads **forests must be cut down**, and this destroys the ecosystem even further. In addition, **poachers are free to roam, who kill and consume thousands of African game unable to hide**. Mountain gorillas live near the Kongo river. Today, as a result of mining, only 500 of them are left, while their number was almost ten thousand ten years ago.



Due to the rapid growth of the electronic industry, demand for stannum increased. Almost half of the demanded volume is obtained from Indonesian islands, where there is no machinery in the open pits, people work with buckets, picks, by hand. Every week, 10-15 teenage boys die during work. Apple, Sony, Panasonic, Samsung and LG Electronics, as well as Chinese manufacturers obtain necessary stannum from here.

### Source:

<https://archivum.szitakoto.com/folyoiratcikk.php?cikk=691?cikk=691>

<http://ecolounge.hu>

<https://harmonet.hu>

# Situation games - Conscious consumption 1.4

## Dear Group,

You will have the following task: you have to play a situation about shopping!

In this situation, the family prepares for weekend shopping, however, they do not agree on where to shop for food and what to buy. Choose parent and child roles. Read the description you received and check out the graph, then play an imagined conversation with your “parents” and try to persuade them not to shop in the supermarket this time!

You have 20 minutes to prepare for the short play, then 5 minutes to present it. In the evaluation, we will take into consideration what information was integrated into your play and how well you delivered your argument. You can use your notes when you present the scene, however, you are not supposed to read it out! If you want more people can present the scene or even all of you!

**You will be the second group presenting your situation. Good luck!**

## Conscious consumption

We are consumers, we shop every day, and it really matters how we do it. When we go into the shop and take an item from the shelf, we rarely consider where, how, and in what circumstances it was manufactured, whose work is behind its production.

Earlier society was self-sustaining in many respects, and if not, we shopped at the market, directly from the farmer, the producer, however today we live in a globalized world. **We would be surprised if we had to calculate after each shopping “how many kilometers do we eat?”, namely how much had the products we bought travelled until they reached the shelves of the shop. In Hungary, today we buy more than 65% of food in shops bigger than 400 square meters, in supermarkets, and unfortunately big shops are characterized by centralized procurement, and we rarely find products coming from nearby.**

**The travelling of products**, besides environmental pollution due to transport have another severe threat: **we do not know by whom, where and how the given product was made. Did the producer use any type of herbicide, preservatives**, and if yes, what. Besides it is also important whether **the person who produced the food received a decent wage for it**, and whether the production of the given item involves child labor.

### SHORT SUPPLY CHAIN (DIRECT SALES)



# Situation games - Conscious consumption 1.4

IT IS WORTH BUYING LOCAL FOOD, DIRECTLY FROM THE FARMER FOR THE FOLLOWING REASONS:

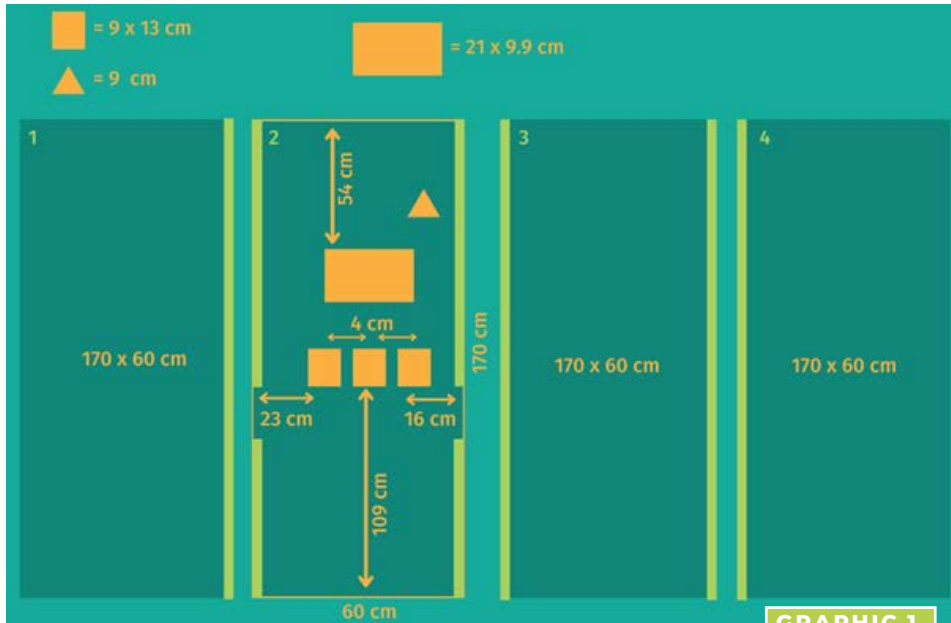
- We can get to know the farmer and talk with them about their products.
- We can be certain that we can have fresh and healthy food on our table.
- Going to the market is an exciting social program, and we can even find special ingredients on the farmers' markets.
- We do not increase the burden on the environment with our choice, which cannot be said about products coming from far away. When we buy local products, we also promote the increase of biodiversity.
- By choosing local products, we can support farmers and the local economy.
- In case of local products, good quality is guaranteed, the quality guarantee of the food we buy is the farmer himself, standing in front of us.



# Attachment - Simple Games

## Ecomatic

1.5



GRAPHIC 1.

**1. STEP:** Take the 4 sheets of large cardboard and apply the adhesive tape to the bottom edge of the cardboard to ensure that no humidity can get underneath and damage the cardboard.

**2. STEP:** Place the cardboard sheets side by side along their long edges. Number the cardboard sheets from left to right. Draw a line, 6-8 cm away from the edges of the cardboards that align. This will be the space that the bands of burlap will cover so be aware to not draw anything over the lines when decorating the cardboards.

**3. STEP:** Take the second, main cardboard and draw the question window and answer slots on it with a pencil. You can find the explanation of sizes on **PIC 1**.



GRAPHIC 2.

**4. STEP:** Draw the captions on the main cardboard. See the captions on **GRAPHIC 2**.

**5. STEP:** Design the look and paint the rest of the cardboards. Let it dry for a day.

**6. STEP:** Cut out the question window and answer slots with the box cutter. Keep the 3 pieces of cardboard cut out for the answers.

**7. STEP:** Reinforce the question window and answer slots from the inside with the adhesive tape.

**8. STEP:** Align the transparent sheet protector with the window previously cut in the cardboard. The sheet protector should be fixed to the cardboard in a way that the printed questions can be slid into it and replaced with a new one after answering. This way the players will only see the questions in the window.



PIC 1.

**9. STEP:** Take the 3 pieces of cardboard that you cut out for the answer slots. Cut each piece 0.5 cm smaller. These will be the „swinging doors” with the letters A, B, or C of possible answers painted on them.



PIC 2.

**10. STEP:** Reinforce the inner (unpainted) side of the answer slots with adhesive tape before piercing them in two or three places. After piercing them, use a string and attach them to the main cardboard (2).

## Attachment - Simple Games

# Ecomatic

1.5

**11. STEP:** Arrange the 4 sheets of cardboard side by side in a line, leaving a small gap between them to allow folding. With the wide adhesive tape - to prevent shifting - you should first fix the cartons crosswise in a few places. Then you can fix them together with the adhesive tape lengthwise (with 2-3 strips cut off). It is better to attach the two outer cardboards together first, and then to join these double sides by the tape at the end.



**12. STEP:** Turn the already glued double cardboard over and glue the painted side together. To do this, prepare the bands of burlap that you have cut in advance. Brush the edges of the cardboard with the bookbinding glue (a good part of the cardboard will absorb the glue so use a bigger amount). Work the bands of burlap well into the glue - it is OK if it runs through because the white glue (diluted with water) will be colorless when dry - and the canvas can be painted.



**13. STEP:** At the end, use a similar technique to glue the two cardboard sides together. The glue sets quickly, but it takes at least a day to completely dry. Put the glued cardboard upright to keep the final bending direction. The next day - if necessary - the canvas can be painted with additional paint.

### ARRANGING PLACE

We need a large space where we can place the cardboard box. The box can be used in 2 ways. Once when the box is folded, in this case, it does not need to be placed close to a wall, it can stand alone anywhere. We can also use it as a folding screen but then it needs to be placed in front of a wall.



# Attachment - Simple Games

## Ecomatic

1.5

### QUESTIONS

#### TOPIC: CLIMATE CHANGE

**What does the expression “ecological footprint” mean?**

- a. The capability of the Earth to support us.
- b. This is a measure which shows what our indirect and direct greenhouse emission is.
- c. **How much area (soil and water too) is necessary to fulfil our needs and absorb the harmful materials we produce.**

**Which country has the biggest ecological footprint?**

- a. Hungary
- b. Ecuador
- c. **Sweden**

**What is the measurement unit of the ecological footprint?**

- a. Liter
- b. **Global hectare**
- c. Square meter

**What does not belong to global hectare?**

- a. Pastures
- b. **Desert**
- c. Arable land

**Why is climate change a problem?**

- a. **It upsets the ecosystem to which we have adapted to during the centuries.**
- b. We need to use more solar screen due to the thinning of the ozone layer.
- c. In hot weather trees absorb more carbon dioxide.

**What happens when the greenhouse effect increases?**

- a. **The planet warms up.**
- b. Winters will be shorter.
- c. Days will be longer.

**Which country contributes the most to global warming?**

- a. Hungary
- b. Russia
- c. **The USA**

**Why is the level of the oceans rising?**

- a. Due to the heat expansion of water.
- b. More and more waste gets into the ocean and it gradually displaces water.
- c. **Because the ice and the arctic glaciers melt and the water temperature is rising.**

**In what country people do not have to be evacuated due to the rise of the level of the oceans?**

- a. Bangladesh
- b. China
- c. **Belorussia**

**What is the consequence of the warming up of the oceans?**

- a. **Corals are destroyed and streams change.**
- b. There will be bigger waves on the shores which threaten settlements near the water.
- c. Tourism will boost, causing more pollution to the waters.

## Attachment - Simple Games

# Ecomatic

1.5

**What can you do against climate change?**

- a. I decrease my consumption.
- b. I watch less advertising.
- c. I throw out the things I do not need anymore.

**Which is the biggest carbon dioxide producer in Hungary?**

- a. Heating
- b. Motorized vehicle traffic
- c. Electric energy production

**How much is the carbon dioxide emission of an average European per person?**

- a. 3-4 tons a year.
- b. 4-5 tons a year.
- c. **6-8 tons a year.**

**Where did the states sign the agreement curbing carbon dioxide emissions?**

- a. In Washington.
- b. In Korea.
- c. **In Kyoto.**

**Which is not a natural source of carbon dioxide?**

- a. Breathing
- b. **Transport**
- c. Seas

**What percentage of carbon dioxide in the atmosphere is emitted by cars?**

- a. 4-5%
- b. **20-22%**
- c. 25-30%

**What distance can we travel by taxi from the annual sustenance costs of a car?**

- a. 1500 km
- b. 2000 km
- c. **3000 km**

**How many kilograms of pollutants can be filtered by a fifty-year-old tree from the air?**

- a. 208 kg
- b. **405 kg**
- c. 603 kg

**How much carbon dioxide can be absorbed by a fifty-year-old tree approximately in a year?**

- a. 40kg
- b. 50kg
- c. **70kg**

**How much oxygen is produced by a fifty-year-old tree approximately in a year?**

- a. 30kg
- b. 40kg
- c. **50kg**

**How much oxygen an average adult needs for breathing in a year?**

- a. 100 kg
- b. 605 kg
- c. **456 kg**

# Attachment - Simple Games

## Ecomatic

1.5

**Why does the level of carbon dioxide decrease in summer on Earth?**

- a. Because of the longer days.
- b. **Because there are more green surfaces in the Northern hemisphere of Earth.**
- c. It does not decrease.

**Why is it better to buy local food than imported food?**

- a. **Because less carbon dioxide is emitted, because the transportation distance is shorter and it has to be stored for a shorter time.**
- b. Because local food is more tasty and contains more nutrients.
- c. Because local food costs less and we can save money.

**Which gas is a greenhouse gas?**

- a. **Dinitrogen oxide**
- b. Radon
- c. Hydrogen

**We can find dinitrogen oxide in what products?**

- a. **In whipped cream maker cartridges.**
- b. In products packaged in protective gas.
- c. In PB gas canisters.

**Where does methane come from into the air?**

- a. From natural resources.
- b. By human activities.
- c. **Both.**

**Which gas is a greenhouse gas?**

- a. Neon.
- b. Ammonia.
- c. **Halogenated hydrocarbons.**

**Where are halogenated hydrocarbons not produced?**

- a. In seas.
- b. During the burning of woods.
- c. **In an oxygen canisters.**

**What halogenated hydrocarbons cannot be used for?**

- a. In aerosols
- b. **Making fire**
- c. Degreasing

**Why soil coverage is good?**

- a. **Because we protect the soil from the eroding effect of the sun, wind and precipitation and eliminate weeds.**
- b. It is not good because it decreases the number of microorganisms living in the soil.
- c. It is not good because it deteriorates the quality of the soil.

**From the following, which one is an animal?**

- a. **Coral**
- b. Spider orchid
- c. Ephedra

**Why is the wood warmer in autumn than its surroundings?**

- a. Because warm air is stuck among the trees.
- b. **Because the fallen leaves decompose and warm the air.**
- c. The trees warm up the air.

# Attachment - Simple Games

## Ecomatic

1.5

### TOPIC: ENERGY

On the energy efficiency label of household appliances which letter indicates the most economical one?

- a. „A”
- b. „G”
- c. „H”

How much more energy do we use when we boil water without putting on the lid than with the lid?

- a. 10-15% more
- b. 3-4 times more
- c. There is no difference, water boils during the same time whether it is under a lid or not

In which case is it worth switching off a traditional bulb?

- a. Immediately when I leave the room.
- b. If I leave the room longer than 5 minutes.
- c. In none of these cases; the best is to leave the bulb on all the time.

Where is it not worth changing the traditional bulb to compact fluorescent lamp?

- a. In the living room
- b. In the pantry.
- c. In the bathroom.

How much less a compact fluorescent lamp consumes compared to traditional bulbs?

- a. It consumes the same.
- b. 30-40% less.
- c. 60-80% less.

What percentage of electricity is transmitted by a compact fluorescent lamp in the form of light?

- a. 10%
- b. 7%
- c. 3%

What percentage of electricity is transmitted by a traditional bulb in the form of light?

- a. 2%
- b. 10%
- c. 20%

How much less do modern household appliances consume?

- a. By 20-50%.
- b. By 50-60%.
- c. By 80%.

What causes the increase of the greenhouse effect?

- a. The thinning of the ozone layer
- b. The increase of carbon dioxide, nitrogen oxide and methane in the atmosphere
- c. The slowing down of the Gulf stream

What is the best way of airing the room in winter?

- a. I do not even open the window not to let the warm out.
- b. The window is open all the time to a crack.
- c. I open the window several times, for short periods.

The energy saving (compact) lamp is

- a. Hazardous waste.
- b. Considered normal household waste.
- c. Can be composted.

## Attachment - Simple Games

# Ecomatic

1.5

**Which is not a reusable energy source?**

- a. Geothermal energy
- b. Natural gas**
- c. Solar energy

**Which is a reusable energy source?**

- a. carbon
- b. biomass**
- c. nuclear

**Which is not a reusable energy source?**

- a. Hydrogen
- b. Solar energy
- c. Uranium**

**What are solar panels not used for?**

- a. electricity production**
- b. heating
- c. making hot water

**What is the most environmentally friendly way of household waste disposal?**

- a. Incineration after selective collection.
- b. Recycling after selective collection.**
- c. Putting in a landfill after selective collection.

**How much water can you save if you do not bathe in a bathtub, but shower?**

- a. 5-6 liters
- b. 50-60 liters**
- c. 100-150 liters

**How much water flows away from a dripping tap a day?**

- a. 0.2-0.5 liter
- b. 2 - 5 liters
- c. 5-10 liter**

**How much water is needed for one showering?**

- a. 20 liters
- b. 70 liters**
- c. 100 liters

**How much water is needed for one bath in a tub?**

- a. 20 liters
- b. 80 liters
- c. 140 liters**

**Why are vertical gardens good?**

- a. It is environmentally friendly and the weather is less hot in summer.**
- b. It makes the house more beautiful.
- c. It protects the house from weather extremities.

**TOPIC: WASTE / RECYCLING**

**In Hungary, one person produces how much waste a year?**

- a. 120 kg
- b. 300 kg**
- c. 400 kg

**In your opinion, how much hazardous waste does an average person produce in Hungary a year?**

- a. 70 kgs
- b. 80 kgs
- c. 100 kgs**

**Which packaging material can be recycled the most times?**

- a. Plastic bottle
- b. Metal container
- c. Glass bottle**

**What proportion of the collected waste is recycled in Hungary?**

- a. Less than a third**
- b. Approximately half
- c. Almost two thirds

**By which method can we decrease the amount of waste in our household by almost one third?**

- a. If we burn paper waste.
- b. If we crush plastic and metal containers.
- c. If we compost organic materials and green waste.**

**Which one cannot be thrown into the glass container of the recycling island?**

- a. Burnt out bulb**
- b. Empty champagne bottle
- c. Jar

**On average, how much waste is generated from disposable nappies used by a baby in 2 years?**

- a. 1 ton**
- b. 1 quintal
- c. 1 kilogram

**Which one is the best paper from the aspect of the environment?**

- a. The one made of paper, because it did not require cutting down trees.**
- b. Paper made of wood coming from sustainable forestry.
- c. Coarse grain drawing paper.

**What gas responsible for climate change can be produced at landfills?**

- a. Carbon monoxide
- b. Methane**
- c. Nitrogen

**Which material cannot be composted?**

- a. Eggshells
- b. Used coffee grounds
- c. Used nappies**

**There are oil stains on the paper pizza box. What can I do?**

- a. Nothing, you can throw it in the paper waste.
- b. It has to be thrown in communal waste.
- c. We can cut out the stained parts and then put the rest in the paper waste.**

## Attachment - Simple Games

# Ecomatic

1.5

**Where can we dispose heat-resistant coffee containers after use?**

- a. In plastic waste.
- b. In paper waste.
- c. **In mixed waste, as it cannot be recycled.**

**When the paper vacuum clear bag is full, where shall I put it?**

- a. In paper waste.
- b. It has to be collected separately and taken to the recycling yard.
- c. **Due to the waste and dust in it, we must put it into communal waste.**

**The orange juice container has three layers: it consists of paper, polyethylene and aluminium. Which bin shall I throw it in?**

- a. **It depends on where the service provider requires it: paper, or plastic.**
- b. Paper.
- c. In metal waste.

**Where shall we put used cooking oil?**

- a. We can put it in a plastic bag and throw it in the communal bin, it will not pollute this way as it will be incinerated.
- b. **It has to be collected and taken to a recycling point.**
- c. Pour it into the sink, as the pollutants are removed at the sewage plants.

**A child throws out the bound notebooks used last year. Where shall they put it?**

- a. **In paper waste, as the plastic binding is not a problem.**
- b. In communal waste, as it is mixed waste.
- c. In plastic waste, as paper is not a problem.

**A child accidentally broke his plastic toy. Shall he put the parts in the PET bottle container?**

- a. No, it is only for plastic bottles.
- b. If the parts are small, yes, if not, it has to be put out when there is the annual junk collection.
- c. **Of course, it is plastic.**

**The wine bottle has a metal screw-on cap. Where shall I put the cap, the flask and the paper label?**

- a. I remove the paper, wash the bottle and everything goes into a separate container.
- b. **I put the cap into the metal bin, but the bottle with the paper label can go into the bottle container.**
- c. I do not remove the paper and I throw it in the communal bin, together with the cap.

**After housepainting a little paint has been left, in a plastic bucket, with metal handle. Where can you put it?**

- a. **I will take it to a recycling point.**
- b. In metal waste.
- c. In plastic waste.

**Do you rinse the detergent bottle before you throw it away?**

- a. No.
- b. **Yes, because it can only be collected separately and recycled in this manner.**
- c. No, because it is hazardous waste.

**The net in which you buy potatoes, where can you put it?**

- a. **It is plain plastic.**
- b. It is hazardous waste.
- c. Communal waste, it is not plastic bottle.

## Attachment - Simple Games

# Ecomatic

1.5

**What happens when the compost heap dries out?**

- a. **The composting process stops.**
- b. The composting process accelerates.
- c. Microorganisms multiply.

**Which one cannot be put in the compost?**

- a. Goose feather.
- b. Dry vegetables.
- c. **The contents of the dustbag from the vacuum cleaner.**

**What is compost?**

- a. **Home-made humus.**
- b. Kitchen waste.
- c. The total of microorganisms.

**What happens when the compost soil is too wet?**

- a. The wetter it is, it is the better.
- b. **It will become rotten and stinky.**
- c. Nothing, as it needs moisture.

**What tree leaf degrades with difficulty:**

- a. Linden.
- b. Maple.
- c. **Walnut.**

**Which one cannot be put in the compost?**

- a. **Fly agaric**
- b. Snowdrop
- c. Rotten tomato

**What is the temperature of compost in the maturing phase?**

- a. It depends on the season.
- b. **It is not warming anymore, but gradually cooling down.**
- c. 30°C

**Why is compost good for the soil?**

- a. Because it is made of organic waste
- b. **It contains nutrients in a form which is easily absorbable for plants.**
- c. Because it is easy to produce.

**In which phase can we see mushroom mycelia in the compost?**

- a. In the first phase.
- b. In the maturing phase.
- c. **In the transformation phase.**



# Attachment - Complex programs

## Carbon Snake

2.1



# Attachment - Complex programs

## Carbon Snake

2.1



Attachment - Complex programs  
**Carbon Snake**

2.1



# Attachment - Complex programs




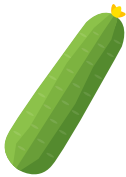










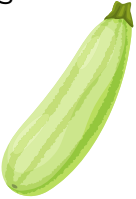
## Carbon Snake

2.1



# Dinner from 0 km

A possible list of plants and animals nearby (Hungary countryside)

- almond
- apple 
- apricot
- barley
- basil
- bean
- beetroot 
- blackberry
- boar
- broccoli
- Brussels sprouts
- cabbage
- carrot 
- cattle
- cauliflower
- celery
- cherry
- cow
- cucumber 
- daikon
- deer
- dill
- fish
- fox
- frog 
- goat
- gooseberry
- grapes
- hazelnuts
- horse chestnut
- hyssop 
- lavender
- lemongrass
- lentil
- lilac
- lily 
- lovage
- maize
- marigold
- medlar
- mint
- nettle 
- oak tree
- onion 
- oregano
- paprika
- parsley
- pattypan squash
- pea
- peach
- pear 
- pig
- pine
- plum
- potato 
- rabbit
- radish
- ragweed
- rape
- raspberry
- red-currant 
- roe
- rose
- salad
- sheep
- sorrel
- sour cherry 
- spinach
- squash
- squirrel 
- stork
- strawberry
- sunflower
- sweet chestnuts
- turnip cabbage
- walnut 
- wheat
- wild rose
- willow
- zucchini

# Ecological footprint

## AUSTRALIA 1

Ecological footprint (million gha)	277.0
Biological capacity (million gha)	313.0
Area (million ha)	1 243.4
Rate of overuse (for country)	0.5
Population (million people)	23.6
Population density (people/ha)	0.34
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	11.7
Numbers of Earth needed for this living	4.1
Length of shoe (cm)	58.7
Width of shoe (cm)	18.8

## AUSTRIA 2

Ecological footprint (million gha)	41.2
Biological capacity (million gha)	25.7
Area (million ha)	7.8
Rate of overuse (for country)	1.9
Population (million people)	8.5
Population density (people/ha)	1.1
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	4.8
Numbers of Earth needed for this living	3.5
Length of shoe (cm)	37.7
Width of shoe (cm)	12.1

## BANGLADES 3

Ecological footprint (million gha)	93.7
Biological capacity (million gha)	65.1
Area (million ha)	19.5
Rate of overuse (for country)	1.9
Population (million people)	159.1
Population density (people/ha)	8.2
HDI (Human Development Index)	0.6
Ecological footprint per capita (gha)	0.6
Numbers of Earth needed for this living	0.5
Length of shoe (cm)	13.2
Width of shoe (cm)	4.2

## BELGIUM 4

Ecological footprint (million gha)	42.8
Biological capacity (million gha)	10.5
Area (million ha)	3.4
Rate of overuse (for country)	7.1
Population (million people)	11.2
Population density (people/ha)	3.3
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	3.8
Numbers of Earth needed for this living	4.0
Length of shoe (cm)	33.5
Width of shoe (cm)	10.7

# Ecological footprint

## BULGARIA 5

Ecological footprint (million gha)	33.2
Biological capacity (million gha)	24.0
Area (million ha)	12.1
Rate of overuse (for country)	1.0
Population (million people)	7.2
Population density (people/ha)	0.6
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	4.6
Numbers of Earth needed for this living	1.9
Length of shoe (cm)	36.8
Width of shoe (cm)	11.8

## BURKINA FASO 6

Ecological footprint (million gha)	22.5
Biological capacity (million gha)	19.6
Area (million ha)	25.7
Rate of overuse (for country)	1.2
Population (million people)	17.6
Population density (people/ha)	0.7
HDI (Human Development Index)	0.4
Ecological footprint per capita (gha)	1.3
Numbers of Earth needed for this living	0.8
Length of shoe (cm)	19.4
Width of shoe (cm)	6.2

## CAMBODIA 7

Ecological footprint (million gha)	16.8
Biological capacity (million gha)	17.0
Area (million ha)	20.4
Rate of overuse (for country)	1.2
Population (million people)	15.3
Population density (people/ha)	0.8
HDI (Human Development Index)	0.6
Ecological footprint per capita (gha)	1.1
Numbers of Earth needed for this living	0.8
Length of shoe (cm)	17.9
Width of shoe (cm)	5.7

## CHINA 8

Ecological footprint (million gha)	4 945.5
Biological capacity (million gha)	1 366.0
Area (million ha)	979.0
Rate of overuse (for country)	3.8
Population (million people)	1 400.6
Population density (people/ha)	1.4
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	3.5
Numbers of Earth needed for this living	2.2
Length of shoe (cm)	32.2
Width of shoe (cm)	10.3

# Ecological footprint

## IVORY COAST 9

Ecological footprint (million gha)	31.4
Biological capacity (million gha)	43.7
Area (million ha)	35.2
Rate of overuse (for country)	0.7
Population (million people)	22.2
Population density (people/ha)	0.6
HDI (Human Development Index)	0.5
Ecological footprint per capita (gha)	1.4
Numbers of Earth needed for this living	0.8
Length of shoe (cm)	20.4
Width of shoe (cm)	6.5

## CROATIA 10

Ecological footprint (million gha)	12.5
Biological capacity (million gha)	12.7
Area (million ha)	10.0
Rate of overuse (for country)	1.2
Population (million people)	4.3
Population density (people/ha)	0.4
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	2.9
Numbers of Earth needed for this living	2.2
Length of shoe (cm)	29.4
Width of shoe (cm)	9.4

## CZECH REP. 11

Ecological footprint (million gha)	60.0
Biological capacity (million gha)	28.0
Area (million ha)	7.9
Rate of overuse (for country)	2.1
Population (million people)	10.5
Population density (people/ha)	1.3
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	5.7
Numbers of Earth needed for this living	3.3
Length of shoe (cm)	40.9
Width of shoe (cm)	13.1

## FINLAND 12

Ecological footprint (million gha)	60.9
Biological capacity (million gha)	70.5
Area (million ha)	37.4
Rate of overuse (for country)	0.5
Population (million people)	5.5
Population density (people/ha)	0.1
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	11.1
Numbers of Earth needed for this living	3.6
Length of shoe (cm)	57.1
Width of shoe (cm)	18.3



# Ecological footprint

## FRANCE 13

Ecological footprint (million gha)	247.4
Biological capacity (million gha)	174.9
Area (million ha)	69.9
Rate of overuse (for country)	1.7
Population (million people)	64.2
Population density (people/ha)	0.9
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	3.9
Numbers of Earth needed for this living	2.8
Length of shoe (cm)	33.7
Width of shoe (cm)	10.8

## GERMANY 14

Ecological footprint (million gha)	378.8
Biological capacity (million gha)	144.4
Area (million ha)	41.1
Rate of overuse (for country)	2.8
Population (million people)	80.6
Population density (people/ha)	2.0
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	4.7
Numbers of Earth needed for this living	3.0
Length of shoe (cm)	37.1
Width of shoe (cm)	11.9

## HAITI 15

Ecological footprint (million gha)	5.3
Biological capacity (million gha)	3.4
Area (million ha)	2.5
Rate of overuse (for country)	2.1
Population (million people)	10.6
Population density (people/ha)	4.2
HDI (Human Development Index)	0.5
Ecological footprint per capita (gha)	0.5
Numbers of Earth needed for this living	0.4
Length of shoe (cm)	12.1
Width of shoe (cm)	3.9

## HUNGARY 16

Ecological footprint (million gha)	37.4
Biological capacity (million gha)	26.5
Area (million ha)	9.2
Rate of overuse (for country)	1.3
Population (million people)	9.9
Population density (people/ha)	1.1
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	3.8
Numbers of Earth needed for this living	2.1
Length of shoe (cm)	33.4
Width of shoe (cm)	10.7

# Ecological footprint

## INDIA 17

Ecological footprint (million gha)	1 401.2
Biological capacity (million gha)	585.7
Area (million ha)	342.0
Rate of overuse (for country)	2.5
Population (million people)	1 295.3
Population density (people/ha)	3.8
HDI (Human Development Index)	0.6
Ecological footprint per capita (gha)	1.1
Numbers of Earth needed for this living	0.7
Length of shoe (cm)	17.8
Width of shoe (cm)	5.7

## INDONESIA 18

Ecological footprint (million gha)	438.5
Biological capacity (million gha)	323.4
Area (million ha)	335.5
Rate of overuse (for country)	1.3
Population (million people)	254.5
Population density (people/ha)	0.8
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	1.7
Numbers of Earth needed for this living	1.0
Length of shoe (cm)	22.5
Width of shoe (cm)	7.2

## IRAQ 19

Ecological footprint (million gha)	61.3
Biological capacity (million gha)	12.3
Area (million ha)	12.8
Rate of overuse (for country)	5.9
Population (million people)	35.3
Population density (people/ha)	2.8
HDI (Human Development Index)	0.6
Ecological footprint per capita (gha)	1.7
Numbers of Earth needed for this living	1.2
Length of shoe (cm)	22.6
Width of shoe (cm)	7.2

## IRELAND 20

Ecological footprint (million gha)	22.8
Biological capacity (million gha)	16.1
Area (million ha)	21.0
Rate of overuse (for country)	1.4
Population (million people)	4.7
Population density (people/ha)	0.2
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	4.9
Numbers of Earth needed for this living	2.8
Length of shoe (cm)	37.8
Width of shoe (cm)	12.1

# Ecological footprint

## MOZAMBIK 21

Ecological footprint (million gha)	18.8
Biological capacity (million gha)	51.6
Area (million ha)	118.4
Rate of overuse (for country)	0.5
Population (million people)	27.2
Population density (people/ha)	0.2
HDI (Human Development Index)	0.4
Ecological footprint per capita (gha)	0.7
Numbers of Earth needed for this living	0.5
Length of shoe (cm)	14.2
Width of shoe (cm)	4.6

## PAPUA NEW GUINEA 22

Ecological footprint (million gha)	18.3
Biological capacity (million gha)	28.6
Area (million ha)	30.5
Rate of overuse (for country)	0.5
Population (million people)	7.5
Population density (people/ha)	0.2
HDI (Human Development Index)	0.5
Ecological footprint per capita (gha)	2.4
Numbers of Earth needed for this living	1.1
Length of shoe (cm)	26.8
Width of shoe (cm)	8.6

## ROMANIA 23

Ecological footprint (million gha)	65.0
Biological capacity (million gha)	56.6
Area (million ha)	25.2
Rate of overuse (for country)	1.0
Population (million people)	19.7
Population density (people/ha)	0.8
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	3.3
Numbers of Earth needed for this living	1.7
Length of shoe (cm)	31.2
Width of shoe (cm)	10.0

## RUSSIA 24

Ecological footprint (million gha)	869.1
Biological capacity (million gha)	986.3
Area (million ha)	1 588.8
Rate of overuse (for country)	0.8
Population (million people)	143.4
Population density (people/ha)	0.1
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	6.1
Numbers of Earth needed for this living	3.3
Length of shoe (cm)	42.2
Width of shoe (cm)	13.5

# Ecological footprint

## SLOVAKIA 25

Ecological footprint (million gha)	24.1
Biological capacity (million gha)	16.2
Area (million ha)	4.9
Rate of overuse (for country)	1.4
Population (million people)	5.4
Population density (people/ha)	1.1
HDI (Human Development Index)	0.8
Ecological footprint per capita (gha)	4.4
Numbers of Earth needed for this living	2.5
Length of shoe (cm)	36.1
Width of shoe (cm)	11.6

## SLOVENIA 26

Ecological footprint (million gha)	8.6
Biological capacity (million gha)	4.7
Area (million ha)	2.0
Rate of overuse (for country)	2.1
Population (million people)	2.1
Population density (people/ha)	1.0
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	4.2
Numbers of Earth needed for this living	2.8
Length of shoe (cm)	35.0
Width of shoe (cm)	11.2

## SUDAN 27

Ecological footprint (million gha)	45.2
Biological capacity (million gha)	45.2
Area (million ha)	274.7
Rate of overuse (for country)	1.1
Population (million people)	39.4
Population density (people/ha)	0.1
HDI (Human Development Index)	0.5
Ecological footprint per capita (gha)	1.1
Numbers of Earth needed for this living	0.7
Length of shoe (cm)	18.4
Width of shoe (cm)	5.9

## THAILAND 28

Ecological footprint (million gha)	176.7
Biological capacity (million gha)	86.1
Area (million ha)	53.6
Rate of overuse (for country)	2.0
Population (million people)	67.7
Population density (people/ha)	1.3
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	2.6
Numbers of Earth needed for this living	1.5
Length of shoe (cm)	27.7
Width of shoe (cm)	8.9

# Ecological footprint

## TUNESIA 29

Ecological footprint (million gha)	17.6
Biological capacity (million gha)	8.8
Area (million ha)	18.7
Rate of overuse (for country)	2.8
Population (million people)	11.1
Population density (people/ha)	0.6
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	1.6
Numbers of Earth needed for this living	1.3
Length of shoe (cm)	21.5
Width of shoe (cm)	6.9

## UKRAINE 30

Ecological footprint (million gha)	185.7
Biological capacity (million gha)	120.0
Area (million ha)	62.7
Rate of overuse (for country)	1.1
Population (million people)	45.0
Population density (people/ha)	0.7
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	4.1
Numbers of Earth needed for this living	1.8
Length of shoe (cm)	34.8
Width of shoe (cm)	11.1

## GREAT BRITAIN 31

Ecological footprint (million gha)	207.1
Biological capacity (million gha)	77.5
Area (million ha)	75.8
Rate of overuse (for country)	4.0
Population (million people)	64.3
Population density (people/ha)	0.8
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	3.2
Numbers of Earth needed for this living	2.9
Length of shoe (cm)	30.8
Width of shoe (cm)	9.8

## U.S.A. 32

Ecological footprint (million gha)	2 663.5
Biological capacity (million gha)	1 144.8
Area (million ha)	995.9
Rate of overuse (for country)	2.3
Population (million people)	319.4
Population density (people/ha)	0.3
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	8.3
Numbers of Earth needed for this living	5.0
Length of shoe (cm)	49.5
Width of shoe (cm)	15.8

# Ecological footprint

## VIETNAM 33

Ecological footprint (million gha)	138.6
Biological capacity (million gha)	92.4
Area (million ha)	30.8
Rate of overuse (for country)	1.7
Population (million people)	92.4
Population density (people/ha)	3.0
HDI (Human Development Index)	0.7
Ecological footprint per capita (gha)	1.5
Numbers of Earth needed for this living	1.0
Length of shoe (cm)	21.0
Width of shoe (cm)	6.7

## CANADA 34

Ecological footprint (million gha)	416.5
Biological capacity (million gha)	541.1
Area (million ha)	929.0
Rate of overuse (for country)	0.5
Population (million people)	35.6
Population density (people/ha)	0.04
HDI (Human Development Index)	0.9
Ecological footprint per capita (gha)	11.7
Numbers of Earth needed for this living	4.8
Length of shoe (cm)	58.6
Width of shoe (cm)	18.8

## 1. Yes-no game

### QUESTIONS:

- Do you like going to school?
- Do you usually complain about having to get up early for school?
- Have you done any physical work yet?  
(brick-carrying, lifting heavy things, fruit-picking, water-carrying, etc.)
- Would you prefer to work instead of school?
- Do you help with housework?
- Do you have any other tasks at home besides studying?
- Do you get pocket money?

## 2. The chain brakes sometimes

### STATEMENTS:

- You spend most of your childhood playing and learning.
- Your further education depends only on your abilities and diligence.
- You're never hungry.
- You can take a bath every day.
- Your home provides security for you.
- You have everything you need. The latest electronic gadgets featured in commercials are likely to be found in your home.
- You go on holiday with your family every year.
- Should you fall ill, social security will take care of your recovery.
- Everyone in your family is paid reasonably well for the work they do.
- You spend most of your free time with family or friends.

The statements can be phrased differently if needed.

## Role cards

### JUANITO

#### AN 8-YEAR-OLD BOY

I live in Mexico City, the poorest neighborhood in the world's most populous city. I begin the tourist-visited districts, as do my 5 brothers, from early morning to late evening.

### MANVEL

#### AN 11-YEAR-OLD BOY

I live in a slum in the capital of Peru, Lima, in a house made of cardboard. There is no electricity or running water, and the sewage from the houses trickles down the middle of the street. I rummage through a nearby garbage dump to find something edible or for sale that will help my family make a living.

### JoAo

#### A 17-YEAR-OLD BOY

I live in one of the favelas (slums) of Rio De Janeiro, the dream city of tourists and the homeland of millions of poor people, where only crime is more prevalent than poverty. From the age of 12, we had no money for my schooling, I didn't even move out of the district made up of a few blocks. By the time of 15, I was a member of one of the local drug trafficking gangs.

### THABO

#### A 14-YEAR-OLD BOY

I live in the driest part of Africa with my family. The family's livelihood is taken care of by my father's income sent home: he works in a remote gold mine. My mother and I walk 8 hours a day to the nearest water source. The water is not clear, it can be a source of many diseases, and we carry the water home on foot.

### SANJANA

#### A 13-YEAR-OLD GIRL

I live in India, in a tea-growing region. My parents are members of the fair-trade cooperative society; their working hours are 8 and a half hours a day instead of the usual 13 hours. Thanks to the fair wages paid to them, I don't have to harvest tea, I can go to school. Unlike my mother, I will learn to read and write, so I will have the opportunity to find a better job.

### MARIA

#### AN 18-YEAR-OLD GIRL

I live in Rome, where my family moved from Colombia in hopes of a better life. My parents have already been granted refugee status and I work illegally for a luxury home cleaning company. I wanted to study to be a beautician, but the money I get for cleaning doesn't allow that.

### ANNE

#### A 16-YEAR-OLD GIRL

I am the daughter of a diplomat belonging to the Swedish Embassy in France. I am studying as a student at an upscale private school in Paris. In my free time, I go to ballet classes and learn to play the piano.

### JESSICA

#### A 15-YEAR-OLD GIRL

I live in Beverly Hills. My father is a cool lawyer, and my mother is a fashionable interior designer. My family is a member of the top ten thousand and everyday guests at elegant Hollywood parties. I can get everything I want or like right away.



## Role cards

**ERIC**

**A 9-YEAR-OLD BOY**

I live in the village of Tabaka (Kenya), and my father carves sculpture stones as a member of a fair-trade organization. It allows me to go to school. My parents can pay my tuition and the compulsory school uniform. My 5-year-old sister also goes to school.

**VANDANE**

**A 16-YEAR-OLD GIRL**

I am a girl from India; I help my mom with my two sisters at home. Our job is to take care of the male members of the family. I have 7 brothers; they can go to school and study. I'm in love with a boy from another caste, and he likes me too, but we can't talk to each other.

**JÁNOS**

**A 10-YEAR-OLD BOY**

I live in a small village in Borsod county, Hungary. My father is a machine operator at an injection moulding company. He found no other job within a radius of 100 km. His employer only pays the minimum wage, they do not pay overtime. My mother works as a cleaning lady, but we can still live very poorly. The only present for Christmas is food.

**LEILA**

**A 12-YEAR-OLD GIRL**

I am an Iranian child and have been working as a carpet weaver since I was 7 years old. I don't have time for school because I have to work with the carpets 10 hours a day to help my family. The carpets are bought by foreign tourists for good money, but I only see as much money out of it that just covers my livelihood.

**DOMO**

**A 14-YEAR-OLD BOY**

I live with my parents in Nagasaki, Japan, in a 30 m<sup>2</sup> apartment that is two magnetic train stops away from my father's workplace. My greatest desire is to work there as an engineer, so I dedicate all my energy to the school. We throw a big PlayStation party once a week.

**ANGÉLA**

**A 12-YEAR-OLD GIRL**

I live in a small town in Hungary. My mother is an employee of a social enterprise, making folk weaves. Her salary is enough for daily purchases, with paid overtime. She can also buy clothes every two months. Her rights are guaranteed in an employment contract, and all contributions are paid afterwards.

**SÁRA**

**A 12-YEAR-OLD GIRL**

I live in a small village in Baranya county, Hungary, with my parents, grandparents, and eight siblings. My family respects tradition. According to the customs of the Lovari Roma, the community expects me to get married and have children before finishing primary school.

# Household appliances in the past

Name of appliances	What do we use it for today?	How did people solve this in the old times?
electric whisk		
bread slicer		
gas stove		
electric oven		
clothes dryer		
vacuum cleaner		
blender		
extractor hood		
crumb vacuum cleaner		
electric shaver		
hair cutting machine		
heating pad		
battery kitchen scales		
electric peeler		
home alarm system		
air conditioning equipment		
humidifier		
dehumidifier		
battery can opener		
electric pepper mill		
Flashlight		

# Renaissance of Season

## A POSSIBLE LIST OF HUNGARIAN SEASONAL FRUITS:

FRUIT / MONTH	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Apple	x	x	x	x	x		+	+	+	+	x	x
Apricot							+	+				
Black currant						+	+					
Blackberry							+	+	+			
Blueberry							+	+	+	+		
Cherry					+	+	+					
Chestnut									+	+		
Dogwood									+			
Elderberry							+	+				
Figs								+	+	+		
Gooseberry						+	+					
Grape								+	+	+	x	x
Medlar	x	x								+	+	+
Peach						+	+	+	+			
Pear	x	x	x				+	+	+	+	x	x
Plum							+	+	+			
Quince	x	x	x							+	+	x
Raspberry						+	+	+	+			
Red currant						+	+					
Rose hips	+									+	+	+
Sour cherry						+	+					
Strawberries					+	+			+			
Sweet melon							+	+	+			
Watermelon							+	+				

x – During this period, thanks to traditional storage methods, certain fruits and vegetables can still be enjoyed (www.tudatosvasarlo.hu, Könczey, S. Nagy 1997)

# Renaissance of Season

FRUIT / MONTH	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Asparagus				+	+	+						
Beetroot	x	x	x			+	+	+	+	+	x	x
Black radish	x	x	x							+	+	x
Broccoli									+	+	+	
Brussels sprouts	x	x	x						+	+	+	+
Cabbage	x	x	x	x	+	+	+	+	+	+	x	x
Carrot	x	x	x			+	+	+	+	+	x	x
Cauliflower	x				+	+	+	+	+	+	x	x
Celery leaves			+	+	+	+	+	+	+	+		
Celery tuber	x	x	x	x	x	x	+	+	+	+	+	x
Chinese cabbage									+	+	+	+
Chives			+	+	+	+	+	+	+	+	+	
Cucumber						+	+	+	+			
Dill					+	+	+	+	+	+		
Eggplant								+	+	+	x	
Garlic	x	x	x	x	x	x	x	+	+	+	x	x
Green beans						+	+	+	+			
Green peas					+	+			+			
Green pepper						+	+	+	+	+		
Horse-radish	+	+	+	+	+	+	+	+	+	+	+	+
Jerusalem artichoke	+	+	+						+	+	+	
Kohlrabi	x	x	x		+	+	+	+	+	+	+	x

FRUIT / MONTH	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Leek	+	+	+	x	x	x	+	+	+	+	+	+
Lettuce				+	+	+			+	+		
Lovage				+	+	+	+	+	+	+		
Maize / Corn							+	+	+	+		
Monthly radish				+	+	+			+	+		
Onion	x	x	x	x	x	x	+	+	+	x	x	x
Parsley green	+	+	+	+	+	+	+	+	+	+	+	+
Parsley root	x	x	x	x	x	x	+	+	+	+	+	x
Parsnip	x	x						+	+	+	x	x
Pattypan squash							+	+	+			
Potato	x	x	x	x	+	+	+	+	+	+	x	x
Pumpkins						+	+	+	+	+	x	x
Rhubarb			+	+	+	+	+	+	+	+		
Savoy cabbage	x	x							+	+	+	x
Sorrel			+	+	+	+	+	+	+	+	+	
Spinach				+	+	+	+	+	+	+		
Spinach beet			+	+	+	+	+	+	+	+		
Spring onion				+	+							
Tomato							+	+	+	+		
Zucchini						+	+	+	+	+	x	

# Electronic devices - 1.

## THE TRUE LIFE OF ELECTRONIC DEVICES



### THE LIFE OF OUR ELECTRONIC AND IT DEVICES (SMARTPHONES, TABLETS, LAPTOPS)

- doesn't begin when we buy them or receive them as gifts,
- and doesn't end when they break or when we get bored and get new ones.



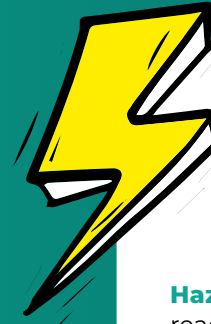
### THE BACKGROUND OF OUR ELECTRONIC DEVICES

- The **raw materials** needed for manufacturing **must be mined** (copper, gold, lithium, cobalt, tantalum, etc.).
- Their production requires a lot of energy.
- The manufacturing process creates many environmentally polluting materials
- They are frequently assembled in environments that are detrimental to health and under unfavorable working conditions.



### DEVICE SHIPPING

The raw materials, the components, and the assembled device may travel all around the globe before reaching us.



### USE

Our electronic devices use **energy**. Storing and transferring information on the internet costs huge amounts of energy: browsing Facebook for 3–4 minutes requires the same amount of energy needed as a single LED bulb does to be on for an hour.

**Hazardous chemicals** may escape from our devices and reach the environment and may even impair our health.

Thanks to advertisements and the „planned obsolescence“ of our gadgets we usually buy new ones after 1,5-2 years.

### THE AFTERLIFE OF OUR ELECTRONIC DEVICES

- After we're done, the devices are either thrown away and increase hazardous landfills,
- or they are mass-imported to Asia or Africa where their recycling is done under inhumane working conditions and in an environmentally polluting way.
- or they end up in a drawer with the used energy and raw materials wasted.



The industry is so profitable for IT companies because the **true cost** of the devices is not on the label: **Society bears the burden of the environmental and societal costs.**

# Electronic devices - 2.

## RAW MATERIALS USED FOR ELECTRONIC DEVICES

### HOUSING:

- Al** aluminium – 41,845 metric tons
- plastics** – 18,478 t\*
- Mg** magnesium – 10,329 t\*
- Fe** iron (steel) – 1,708 t\*

### PRINTED

#### CIRCUIT BOARDS:

- Au** gold - 46 t\* – 250 t\*
- Pd** palladium - 17 t\*
- Cu** copper – 29,031 metric tons
- Ag** silver - 467 metric tons

#### SOLDERING MATERIAL:

- Sn** tin – 2,305 t\*
- Ag** silver - 467 t\*

#### LITHIUM-ION BATTERIES:

- Co** cobalt – 10,572 t\*
- Li** lithium – n/a\*

### DISPLAY (TOUCHSCREEN):

- In** indium - 12 t\*
- Sn** tin – 2,305 t\*

### SPEAKERS:

- Rare-earth elements** – 250 t\*
- Cu** copper - 29,031 metric tons

### CABLES:

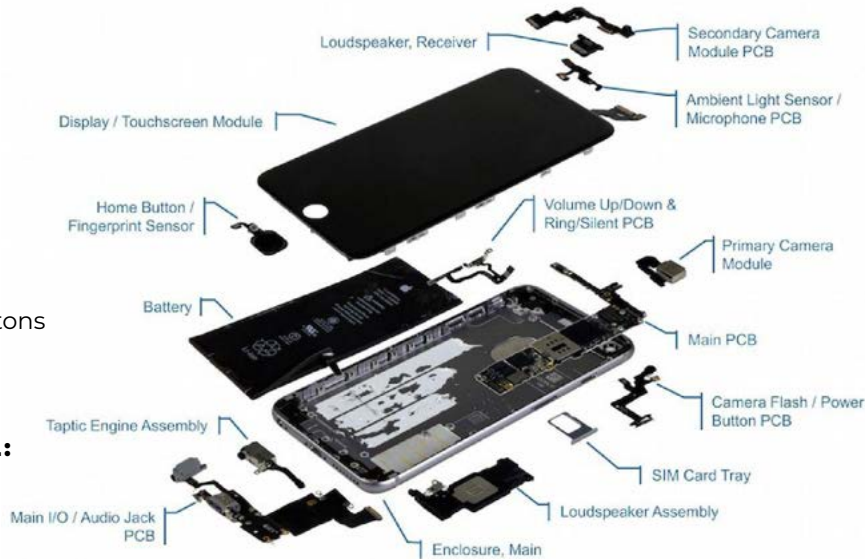
- Cu** copper – 29,031 t\*

### CAPACITORS:

- Ta** tantalum - 32 t\*

#### Keys:

- problematic materials
- conflicted minerals
- rare-earth elements



To make electronic devices (cell phones, tablets, computers, vehicle electronics, etc.) more than 700 types of materials are used, including hazardous chemicals, heavy metals, non-ferrous metals, and rare-earth elements, whose mining and processing usually involve environmentally polluting or damaging activities, and societal problems and armed conflicts can often be linked to mining.



#### Did you know?

The material called „Kryptonite” in the Superman franchise has a chemical composition similar to jadarite, a sodium-lithium-boron-silicate-hydroxide mineral found in the lithium mines near Jadar, Serbia. Our electronic devices’ batteries are primarily made of lithium.

\* Used for smartphones and tablets sold in 2014.

# Electronic devices - 3.

2.10

## PRODUCING RAW MATERIALS (mining)

### ENVIRONMENTAL AND SOCIETAL IMPACTS OF MINING AND ORE PROCESSING:

**Mining** the raw materials needed to make gadgets **requires a lot of energy**. The stones containing ores usually have a very small concentration of precious and non-ferrous metals, therefore **extensive quantities of stone need to be extracted during mining operations**.



In the mines planned to open in the Carpathian basin, the rocks contain 1-2 grams of gold and 15-20 grams of silver per metric ton.

„The making of one golden ring creates 20 metric tons of quarry waste.”



To keep costs low, nowadays the mining is **mostly done in open-pit or opencast mines**, during which whole mountains are moved.



Gold, silver, and other non-ferrous or precious metals are collected from the finely crushed stones by a process using **heavily toxic mercury, cyanide**, or other chemical solvents.



Mining and ore processing may lead to water and soil **pollution by heavy metals and chemicals**, which endangers the health of local societies and is often detrimental to the local agriculture as well.

(A tailings dam, otherwise known as a slurry pond, by a copper mine and containing heavy metals near what used to be Geamăna (Szászavic) in Transylvania – the village had to be abandoned when the dam was built.)



Establishing mines usually comes with **destroying the natural wildlife** and sometimes nearby locals must be resettled as well.

## THE DARK SIDE OF GOLD

The negative effects of gold mining can directly be felt in Europe, yet large quantities of gold are used in our electronic devices. An example of a recent disaster:

### THE CYANIDE SPILL OF BAIJA MARE

The tailings dam belonging to the Baia Mare (Nagybánya) mine of the joint Romanian-Australian mining company Aurul burst open on the **30th of January, 2000**, and **100,000 metric tons of waste containing cyanide and heavy metals** surged into the river Lăpuș (Lápos) and then into the rivers Someș (Szamos) and Tisza. It is estimated that the pollution killed 1,240 metric tons of fish on the Hungarian side of the river Tisza.



<https://www.eea.europa.eu/data-and-maps/figures/spread-of-the-cyanide-spill-from-baia-mare>



The disaster struck Hungary, Ukraine, and Serbia besides Romania due to the contamination of the rivers. The affected countries suffered a variety of losses (tourism, fishing, the cost of restoration, etc.), but the polluting company paid nothing as Aurul's successor, Transgold declared bankruptcy to escape the responsibility.

### ROȘIA MONTANĂ

The biggest open-cast mine in Europe was planned to open at Roșia Montană (Verespatak), Romania, at a proposed World Heritage Site. The hazardous technology would endanger Hungary's waters, too.

- **Cyanide technology** would be used.
- The slurry containing cyanide and heavy metals would be contained behind a **dam of 185 m in length** in the valley of Corna (Szarvaspatak).
- **Thousands of people would need to be resettled** for 225 metric tons of gold.
- Following the cooperation between civilians and green organizations, and the Romanian government's creditable decisions, **Roșia Montană became a World Heritage Site in 2021**, thus the planned mine will never open.



<https://alexandraderla.files.wordpress.com/2013/10/blog-rosia-montana-13.jpg>

and

<https://assets.change.org/photos/6/xy/el/RTxyELywajwpUdh-1600x900-noPad.jpg>



# Electronic devices - 5.

## PRODUCTION AND ASSEMBLY

### WORKING CONDITIONS

The vast majority of our electronic devices are being assembled in China, Taiwan, Vietnam, South Korea, India, and Thailand, usually under inhuman conditions. Young workers toil away at these factories for up to 15-16 hours a day, for months, without weekends or days off. Sometimes even students are forced to work there. The mindless work sometimes leads to the exploited workers committing suicide.

#### Did you know?

A recently published study found that between 2003 and 2017, 167 suicides and suicide attempts were committed in Chinese electronic factories. Most of the cases can be traced back to intolerable working conditions.

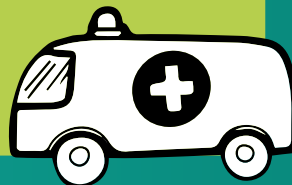


### HEALTH EFFECTS

More than 700 types of hazardous materials are used to make electronic devices. These materials take their toll on the factory workers, too, leading to serious medical conditions. Leukemia, lung cancer, brain tumors, miscarriages, and multiple sclerosis are common.

#### Did you know?

The creators of the documentary *Complicit* found that in the city hospitals of Shenzhen and Guangzhou, dozens of rooms are filled with young Chinese workers suffering from serious illnesses due to benzol and n-hexane exposure. Most used to work at Foxconn or other electronic device assembly factories, where they made phones for Apple. The cost of treating severe leukemia and other illnesses can lead to families taking on huge debts.



#### Did you know?

According to official figures from China, someone falls ill every five hours due to exposure to hazardous workplace chemicals. Benzene and n-hexane are used to clean phone screens. N-hexane can cause neurodegenerative diseases and even paralysis. Benzene is the main cause of occupational diseases. It's a proven carcinogen, especially prone to causing cancer in blood-forming organs (leukemia). Therefore, western countries, including Hungary, banned their use as solvents over 40 years ago. However, China still uses them.

#### Did you know?

A Korean advocacy group has a list of 223 Samsung employees who were diagnosed with leukemia, brain tumor, multiple sclerosis, or other diseases. 76 of them already died.

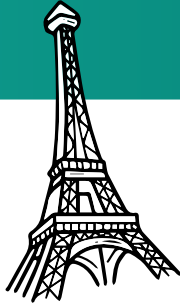


Remembering Samsung's victims (photo by: SHARPS)

# Electronic devices - 6.

## ELECTRONIC WASTE

Every year, more than 45 million metric tons of electronic waste is buried on Earth (weighing about 4,500 Eiffel Towers). In 2016, an average of 6.1 kg of electronic waste was created per person on Earth, including infants.



Sixty types of raw materials could be reused if we recycled e-waste. Nowadays we only reuse about 20%. To put this into a financial perspective: if we reused all e-waste, then 55 billion euros worth of secondary raw materials could be used again. That amounts to Hungary's annual budget.

### Did you know?

Using cyanide, you can get 2 g of gold from 1 metric ton of stone. By reprocessing the same amount of electronic waste, we can get 150 times more gold.

### THE DOWNSIDES OF REPROCESSING ELECTRONIC WASTE

Although reprocessing e-waste can lead to valuable raw materials, the method can be problematic. Reprocessing usually takes place in African and Asian countries (China, India, Pakistan, Ghana, Nigeria, and Tanzania), where the conditions are inhumane and the processes are very polluting. Most of the problems stem from the fact that e-waste contains hazardous materials (heavy metals, mercury, tin, cadmium, flame-retardants, and hydrocarbon derivatives with fluorite or chloride), which contaminate water and soil and lead to serious diseases when inhaled or ingested through food.



### Did you know?

Guiju in China is famous for reprocessing e-waste. On average, the blood of children living in nearby areas contains 54% more tin, and 80% suffer from pulmonary diseases.

Accra in Ghana also reprocesses waste under inhuman conditions.



The image is from the documentary titled *Welcome to Sodom*.

### Did you know?

The biggest e-waste site is in Accra, Ghana. The nearby area is almost constantly filled with thick black smoke that contains toxic materials. Long-term exposure to this smoke will damage the nervous system and the respiratory tract and is prone to causing cancer. The toxic air is dangerous to pregnancies and fetuses, and birth defects are common. The situation is so dire that many people don't even live long enough to reach their twenties.

# Electronic devices - 7.

## SENSIBLE USE

In Hungary, school-age children on average spend 2–3 hours on electronic devices, let that be smartphones, tablets, or laptops. This varies by age group, as the younger ones spend less time, but either way, they spend 20–25% of their waking hours in front of a screen.



Excessive reliance on electronic devices leads to children and teenagers arranging their lives around gadgets. Their societal relationships suffer and they exercise less, which may lead to coordination problems and even obesity in the younger age groups, and mental problems may occur as well. This is caused by online bullying, the need for immediate feedback, and the race for likes, followers, and subscribers, which all increase anxiety, hinder self-esteem, and in extreme cases may even induce suicidal thoughts.

### Did you know?

84% of children between 7–16 have experienced online bullying. Especially at risk are 15–16-year-olds, particularly girls.



## TIPS FOR SENSIBLE USE

**HAVE OFFLINE PERIODS EVERY DAY**  
(e.g. during family events, mealtimes, and especially at night)

Plan **PROGRAMMES** with your friends and family in „the real world“!

**ONLINE BULLYING CONSTITUTES A CRIMINAL OFFENSE.**  
If you experience bullying, ask for help!  
**Don't forget: TECHNOLOGY EXISTS TO SUIT YOU** and not the other way around!

**DON'T SHARE PERSONAL INFORMATION** about you or your peers online!

During one of our events, the children were tasked with spending 24 hours without their smartphones. **IT'S WORTH TRYING!**

### Did you know?

80% of children share their full names, 66% share pictures of themselves, and 40% share their email addresses and true age online.

# Electronic devices - 8.

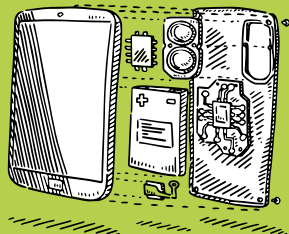
## WHAT CAN WE DO?

### TIPS FOR SENSIBLE ELECTRONIC DEVICE USE



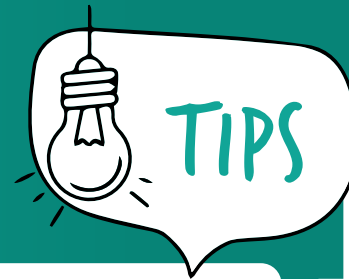
The best way to reduce the environmental and societal impact of electronic devices is to lengthen their lifespan. As long as we're using our current devices, there is no need to mine and transfer raw materials for the next ones, and we don't create demand for producing new models, therefore we don't generate the linked workplace exploitation and diseases.

We can improve the lifespan of our devices by getting them repaired, replacing broken parts, and by using them carefully. If a phone or a laptop is beyond repair, we recommend buying refurbished equipment with at least three years of warranty.



If the only way is to buy a brand-new device, then try choosing a modular phone, or devices whose manufacturing is focused predominantly on minimizing negative environmental and societal effects.

Moreover, make sure you get the old parts and raw materials reprocessed! While you're using your devices, try to reduce your energy and environmental footprint!



**IF THE DISPLAY IS DAMAGED,** or another part breaks, try to replace the damaged part and increase the device's lifespan!

#### REPAIR CAFE

Repair cafes are becoming popular in Western countries: these are communal repair shops where broken electronic devices can be fixed with professional help. Try to see if your country has some!

#### WHAT IF THE DEVICE IS BEYOND REPAIR?

Give your irreparable electronic devices to a company specializing in reusing components that still work. - All electronic devices contain components or raw materials that can be recycled, even if the devices themselves are no longer functional. Therefore, let's take them to electronic shops or recycling sites (that accept them) for proper recycling!

#### IF YOUR DEVICE BECOMES SLOW

because the battery is old, a battery replacement could fix the issue and bring the device back to life. Sometimes returning to the original factory settings also solves the issue of slowness. Just because a device is slow you don't need to buy a new one.

#### WHEN YOU LISTEN TO MUSIC...

use downloaded music instead of online music and video streaming apps, so less bandwidth is required with less infrastructure needed from the data providers, which leads to less global energy use.

#### BUYING NEW DEVICES

If the only option is to purchase a brand-new device, consider choosing one that is designed to be long-lasting and incorporates modular components. This ensures that the device can be easily repaired. Additionally, ensure that the company prioritizes the well-being of its employees by providing good working conditions and fair wages. It is important that they promote the reuse of raw materials for production and avoid sourcing resources from conflict zones. Furthermore, opt for companies that use fair trade gold in their manufacturing process.

#### LET YOUR PHONE REST!

Turn off the data on your phone during the day when you don't use it. When it's nighttime, power off your device or activate airplane mode to reduce energy consumption, extend battery life, and minimize environmental emissions.

# Electronic devices - 9.

## PLANNED OBSOLESCENCE



Everybody's heard that TVs, washing machines, or phones will stop working right after the warranty expires. Maybe they could be fixed, but that's more expensive and more complicated than buying a new device. The planned shortening of a device's lifespan used to be an urban legend. However, now even the manufacturers admit that they purposefully shorten lifespans to incentivize buying new models instead.

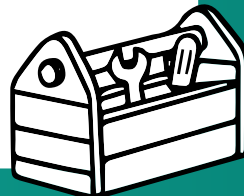
### WHAT IS PLANNED OBSOLESCENCE?

It's purposefully shortening a product's lifespan to incentivize buying new products. It may be achieved through installing deliberate errors or using non-durable materials, but the phenomenon goes beyond a device going bad. Planned obsolescence also entails someone switching to a new model if the user experience suffers, when new models are constantly being churned out and the old one becomes old-fashioned, or when fixing the broken one would be too expensive.

### WHAT CAN YOU DO AGAINST PLANNED OBSOLESCENCE?



- Sign the petition against planned obsolescence!
- Consider if you truly need something before buying!
- Use your devices for longer if they still work!
- Get your broken models fixed!
- Research buying a longer-lasting model!
- Try loaning the devices you don't use daily.
- Sell or gift the devices that still work, and buy used or refurbished products.



### The Apple Incident

After a long period of data collection, the Consumer Protection Directorate of the French Ministry of Economy initiated an official procedure regarding iPhone in January 2017. The company admitted to intentionally slowing older phones down after software updates. They claimed it was to protect battery life. Apple had denied that the slowness was intentional for a while and only admitted it once independent technicians found proof.

### The Epson incident

Official procedures against Epson were initiated in 2017, on the charges that Epson and other printing manufacturers allegedly misled customers by prompting them to replace toner cartridges prematurely, before they were actually empty.

# 2.10

### MAIN ASPECTS OF AN UNFIXABLE PHONE:

**Soft aluminum case** – will show wear and tear immediately!

**Large touchscreen** – guaranteed to crack!

**Custom screws** – make sure the average person can't fix anything!

**Special on/off button** – works perfectly for a single year!

**A new operating system** that slows down older phones

**Battery** – impossible to replace

**New design** – owners of older models will feel like a loser.



## Attachment - Complex programs

# Expedition report - Answer key - Round 1. 2.11

### Task 1

What short and long-term effects did the 2010 red mud disaster have on the environment and the population? **Maximum half a page**

**Score:** maximum 10 points

#### **Solution / Main aspects generating scores**

##### **Short term effects:**

- Caustic soda (sodium hydroxide) is a highly alkaline material. Solid or concentrated lye can cause burns, if it gets into the eyes, eye damage.
- The drying of the flooded mud is also dangerous because of the dustability, which, due to alkalinity may cause increased respiratory irritation.
- Caustic soda leaking into the soil may cause short-term (death of fauna) and long-term (pollution of groundwater) damage.
- Many domestic animals died because of the flood, however lye damages organisms by its caustic effect.
- Aquatic life was directly and severely damaged by the sodium hydroxide (caustic soda) content of the flooding red mud. Downstream from the inlet point in the water of the Torna stream which became strongly alkaline, certainly all life died.
- Waters loaded by concentrated mud obviously upset biological balance, as in the dark water photosynthesis processes halt. The mud consisting of tiny particles is also dangerous for the flora, as it may block vital organs.

##### **Long-term effects:**

- Alkali in flowing water destroys the fauna, which can only regenerate with time, however due to the continuous dissolution the caustic effect of lye decreases quickly and regeneration can begin.
- The plant communities and animal communities on land change more slowly than those in water.
- The dried red mud might turn into carbonates, which result in the salinization of the area, which is tolerated by very few plant species. It cannot be expected that the flora and the dependent fauna regenerate in the near future.
- It is likely that the agricultural areas near the mud lake were damaged so severely that even soil replacement cannot help, thus they must be left out of cultivation for a long time.

### Task 2

- Calculate how much waste is generated to mine gold sufficient for a wedding ring (5g).
- Approximately how many tons of fish died from the cyanide pollution in Baia Mare in 2000, and how many people did not have access to potable water temporarily?
- Where has been gold mining with cyanide banned besides Hungary?

**Score:** maximum 3 points

#### **Solution:**

- During the mining of 5 grams of gold 20 tons, or 20,000 kilograms, i.e. 20,000,000 grams of waste is generated.
- Approximately 1200 tons of fish died from the cyanide pollution in Baia Mare in 2000, and 2.5 million people did not have access to potable water temporarily.
- Gold mining with cyanide has been banned by Hungary, Czechia, Slovakia and two US states, Montana and Wisconsin.

### Task 3

Draw a figure and write next to it what health effects coal smoke has on the human body and the various organs. (If needed, the space can be expanded!)

**Score:** maximum 6 points

#### **Solution**

- Lungs: inflammation, severe chronic respiratory diseases (COPD), breathing difficulties, worse lung reflexes, decreased lung capacity
- Brain: brain circulation insufficiency
- Heart: changed heart functions, arrhythmia, blood supply insufficiency of the heart muscle
- Blood: changes in blood flow, quicker coagulation, peripheral thrombosis, decreased oxygen transport capacity
- Vascular system: peripheral artery disease, diseases of the cell wall, hypertension

## Attachment - Complex programs

# Expedition report - Answer key - Round 1. 2.11

### Task 4

Summarize briefly why it is not true that the desert is deserted anyway, we can mine lithium there without consequences.

**Score:** maximum 8 points

#### Solution:

- Taking out salty water from groundwater decreases the level of groundwater and changes the surface of salty plains. Therefore
- pastures and wetlands dry out, which directly threatens birds nesting and traditional shepherding.
- The transporting lorries pollute the air.
- Dust clouds with high mineral content, formed due to mining when get to the surrounding towns, pastures and nature conservation areas cause health problems, pollute the soil and the water base.
- Activities pursued in earlier untouched areas, the construction of roads, motorized vehicle traffic, the transportation of machinery and people, noise may cause the extinction of the local fauna and result in erosion.
- Local Atacama Indians are threatened by land ownership and land use problems, only jobs with low skills are available for locals, the more senior positions are filled by guest workers from abroad or other parts of the country.

### Task 5

Based on what I have seen in the tantalum mines I have to write a report to domestic news outlets about what I have seen, what I think about the situation and what the problems are. Half page news article.

**Scoring:** maximum 10 points

Here creativity was scored, and to what extent the group could place themselves in the situation and recognize the problems.

### Task 6

What chemical element causes the following symptoms of poisoning in adults: hypertension, limb numbness, headache, abdominal pains, mental symptoms, mood swings, loss of memory. Google searching is allowed this time!

**Score:** maximum 2 points

#### Solution: lead

### Task 7

Describe briefly how the life circumstances of the local stannum mine workers could be improved on the Indonesian islands.

**Score:** maximum 5 points

#### Solution: (in their own words, not copied word by word)

In 2013, environmental NGO Friends of the Earth started a campaign against stannum mining on the island of Bangka. The campaign called Apple and Samsung in a petition to reconsider stannum mining in the region. As a result of the campaign, nearly forty thousand customers contacted Samsung and Apple, asking them to check in what circumstances stannum is mined on Bangka. Samsung acknowledged that some of the stannum used for the manufacturing of their phones comes from areas where miners work in hazardous circumstances. Since then Apple, Philips and LG have committed themselves to support less harmful stannum producing methods, and a "Lead working group" was established (with the participation of the Indonesian government, the industry and civil organizations), which works on "making lead production more sustainable".

### Task 8

Calculate how many grams of stannum is used by an average family during a generation (30 years) in a household. Based on my stannum file, the average stannum content in our gadgets (tablet, mobile, similar gadgets) is the following: 2 g, laptop: 3 g, flat screen television: 5 g, car: 15 g.

## Attachment - Complex programs

# Expedition report - Answer key - Round 1. 2.11

**Score:** maximum 3 points

We scored correct calculations based on the given multipliers, and we accepted the number of items.

	Number of items	Total grams stannum
<b>Tablet, mobile, etc.</b>		
<b>Laptop</b>		
<b>TV</b>		
<b>Car</b>		
<b>Total</b>		

Li	mobile phones, batteries, car, pharmaceuticals
Sn	television, laptop, baby toys, electronic cables, wires, printing, mobiles, paint, car, tin,
Pb	television, laptop, printing, mobiles, paint, car,
Cu	television, laptop, packaging materials, cans, baby toys, electronic cables, wire, printing, jewellery, money, mobile, bowls, car, bronze statue, tin
Ta	television, laptop, electronic cables, wire, printing, pharmaceuticals, mobile, car
Au	television, laptop, electronic cables, wire, jewellery, coins, mobile (pharmaceuticals)
Cu	television, laptop, packaging materials, cans, baby toys, graphite pencil, electronic cables, wire, printing, jewellery, pharmaceuticals, mobile, battery, car
Al	television, laptop, electronic cables, wire, printing, jewellery, mobile, battery, bowls, paint, car

### Task 9

Collect where the mined chemical elements examined by our research group are used in everyday life. I listed the areas of use yesterday, I only have to connect the appropriate chemicals to them, however the Mongolian dust storm flustered my notes :(.

#### Elements

Lithium  
Tin  
Lead  
Copper  
Tantalum  
Gold  
Carbon  
Aluminum

#### Usage area

TV, Laptop  
Packaging can  
Baby toys  
Graphite pencil  
Electronic cable wires  
Printing  
Jewellery, coins  
Medicines, cosmetics  
Battery  
Bowls  
Paint (from the '70s)  
Car  
Bronze statue  
Tin  
Mobile Phone

**Score:** maximum 10 points

**Solution: the ingredients of electronic devices more punctually, in case of the other items the more important ones, maximum score if the most connections were marked correctly.**

### Task 10

I have to list cases, when the mine is funded by banks from European taxpayer money, although there are concerns about the operations of the mine. Here during our expedition there are 3 such mines, I have to write their names and the funding banks here.

**Score:** maximum 3 points

#### Solution:

C	Serbia, Kolubara lignite mine, bank: EBRD
Au and Cu mine	Mongolia, Oyu Tolgoi, bank: EBRD
Cu	Mopani, Zambia, bank: EIB

### Task 11

I should write a good definition for "raw material curse". Then, based on all the mining cases explored during our expedition I have to summarize the main (positive and negative) economic, social and environmental impacts of mines in a table. Only those affecting the lives of locals and those in the neighborhood! The impact which occurs in at least 2 places must be underlined. The number of cells can be increased as you wish, new rows can be added to the table.



## Attachment - Complex programs

# Expedition report - Answer key - Round 1. 2.11

Score: maximum 15 points

Raw material curse: approximately when a country/region in spite of its rich raw material fields is in a worse economic situation and is less stable than its peers which have less abundant raw material sources.

ECONOMIC IMPACTS	SOCIAL IMPACTS	ENVIRONMENTAL IMPACTS
The effect of the raw material curse; due to tax reliefs etc. the government has scarcely any revenues	Human health damage not only with miners, but those living nearby	Hazardous materials get into the water, soil and air
New jobs, however it is only temporary, very hard and sometimes child labor	Forced evictions, relocations or the population flees because of the mine	Dust pollution may render the lands bare, and makes people and animals sick
The mining project leads to one-sided industrial development without any other alternative; this renders the situation of the area even more disadvantaged after the mine is closed down	There is no compensation, or it is not enough for a decent living	The landscape damage of clearfelling etc., decreased biodiversity, deterioration of the microclimate etc.
EIB, EBRD etc. public funds disappear in the mine, they are used for the wrong purposes	The land and other rights of indigenous people are flouted, legal injustice and corruption	Increased transport, lorry traffic resulting in noise, dust pollution
The materials, technology and services necessary for the mining project are usually imported by the company, thus it does not boost the local economy.	Conflicts of interests in the local society due to the mine, e.g. they are dependent on the company because of the promised jobs, they are afraid for their houses, compensation only divides the population, etc.	Ground water level decreases, soil erosion, etc.

**+ FOR EXTRA POINTS**

Based on the solution of the anagram, the Hungarian researcher is at present at this location:

**Score:** plus task + 3 points

**Solution:** Ulanbataar

# Expedition report - Answer key - Round 2. 2.11

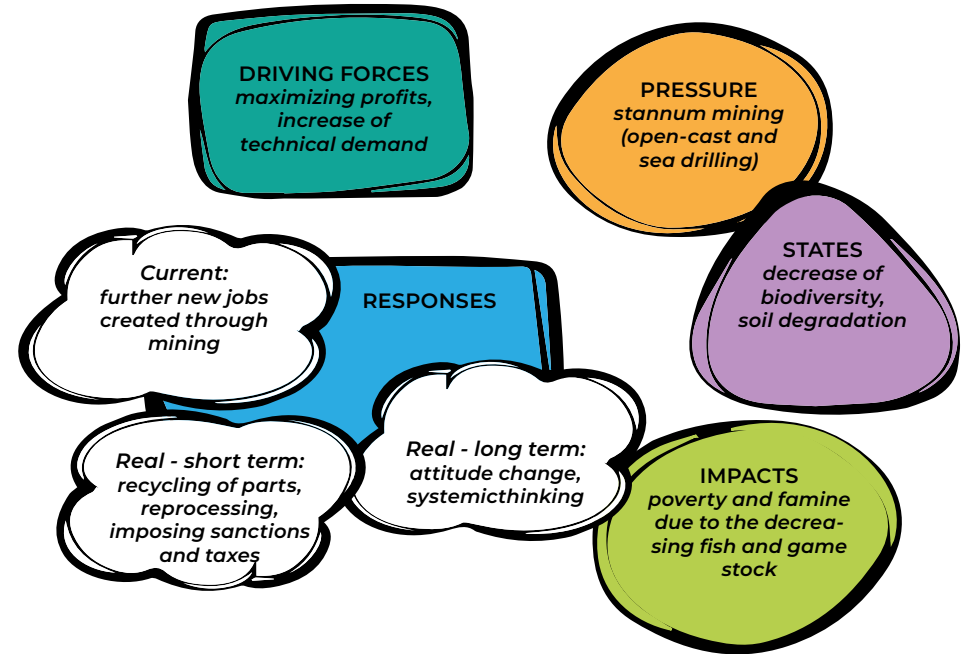
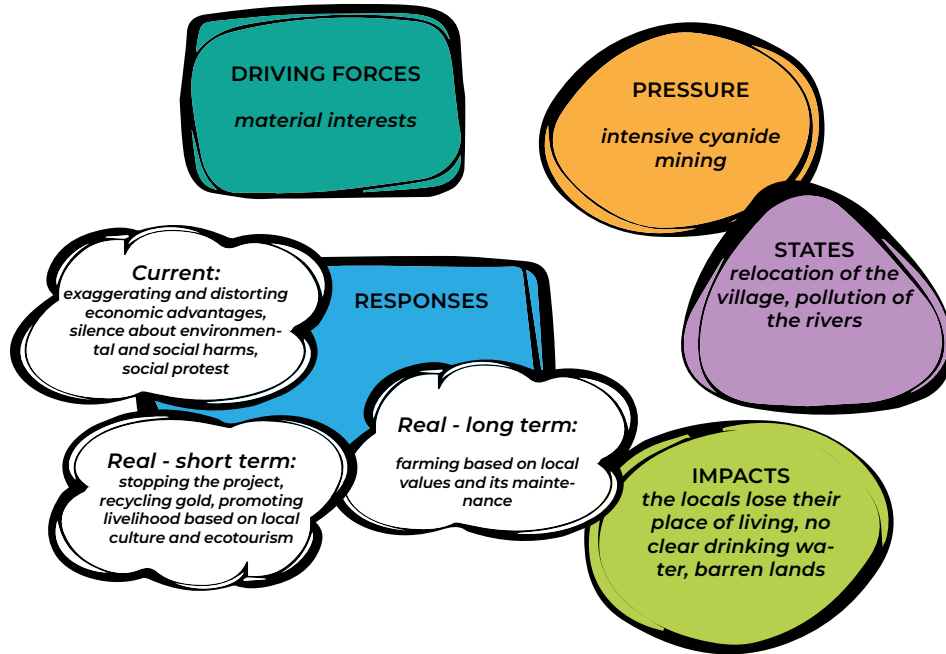
## Task 1 - My tasks for the cause-effect graph

1. a). Filling in the missing parts in the cause-effect graph concerning the Rosia Montana + drawing the arrows (the answer text can be written in the bubbles)

This file may help you: [www.mtvosz.hu/verespatak\\_akta](http://www.mtvosz.hu/verespatak_akta)

1. b). With relevance to stannum mining on the islands of Bangka and Belitung, filling in the missing parts in the cause-effect graph (arrows+ texts). In a round several answers can be given.

Fortunately this file is still available: [www.mtvosz.hu/bangka\\_akta](http://www.mtvosz.hu/bangka_akta)



## Attachment - Complex programs

# Expedition report - Answer key - Round 2. 2.11

### Task 2

What happens to the e-waste coming from mobile phones and similar devices? Maximum half a page, as an article.

**Score:** maximum 8 points

#### Solution - CRITERIA:

- In Hungary, e-waste is recycled only in 18%. Presently, from e-waste aluminium can be collected and recycled most effectively. - Unfortunately for lithium (batteries) appropriate technology is still missing for recycling (it is costly and complicated), thus most of the lithium ends up in landfills or incinerators due to the small-scale collection and the lack of regulation. Aluminium can be recycled in 100%. In Hungary, this value is 50% (Eurostat metal packaging).
- In Hungary, there is a decree governing e-waste, which is in accordance with the 2003 European Union directive. There is household (computer, printer) and business (photocopier) e-waste.
- Private persons usually treat household e-waste incorrectly, while companies are more environmentally conscious (partly because bigger corporations are required to prepare a waste management plan).
- Private persons: recycling yards for the public (13 locations in Budapest) and in retail outlets selling electric goods (when the customer buys a product with the same function, they are obliged to collect the old one - however the customer is not always obliged to buy).
- At companies, because of the bigger volumes either the retail outlet takes them back for recycling or they hire an e-waste company (needs a license, therefore prior conciliation is necessary).
- Waste management is the manufacturer's responsibility!
- Manual disassembling, machine cutting, selection.
- Hazardous waste is taken to the hazardous waste depo.

### Task 3

I have to provide the figure below with explanations about what stages a mobile phone goes through during its life cycle (from the mining of raw materials until their recycling and/or disposal), and what solutions there are at the various stages at present to make the product more environmentally friendly.

In addition I also have to propose further solutions, where I can. The lines can be extended here as well!

	Name of the stage	Present solutions to make the product more environmentally friendly	Further proposed solutions
1	Raw material exploitation/ mining	reclamation following exploitation; using environmentally friendly technologies	Decreasing exploitation
2	Processing/ industry	Designing and compiling a device with environmentally friendly technology; providing for reprocessing; efficient material use	Already when the product is designed the full life cycle must be taken into consideration for better reparability and recycling
3	Packaging	Environmentally friendly packaging or minimizing packaging; applying deposits	Recycling packaging materials, packaging material design
4	Transport	transport rather by train; coordinating transports (not one by one)	Connecting users and processors to minimize distance Local manufacturing and sales.
5	Usage	Less consumption; reusing, conscious buying	
6	Waste disposal/reuse / reprocessing	Termination of disposal; reuse, recycling, reprocessing, repair.	Development and promotion of the existing opportunities as much as possible.

## Attachment - Complex programs

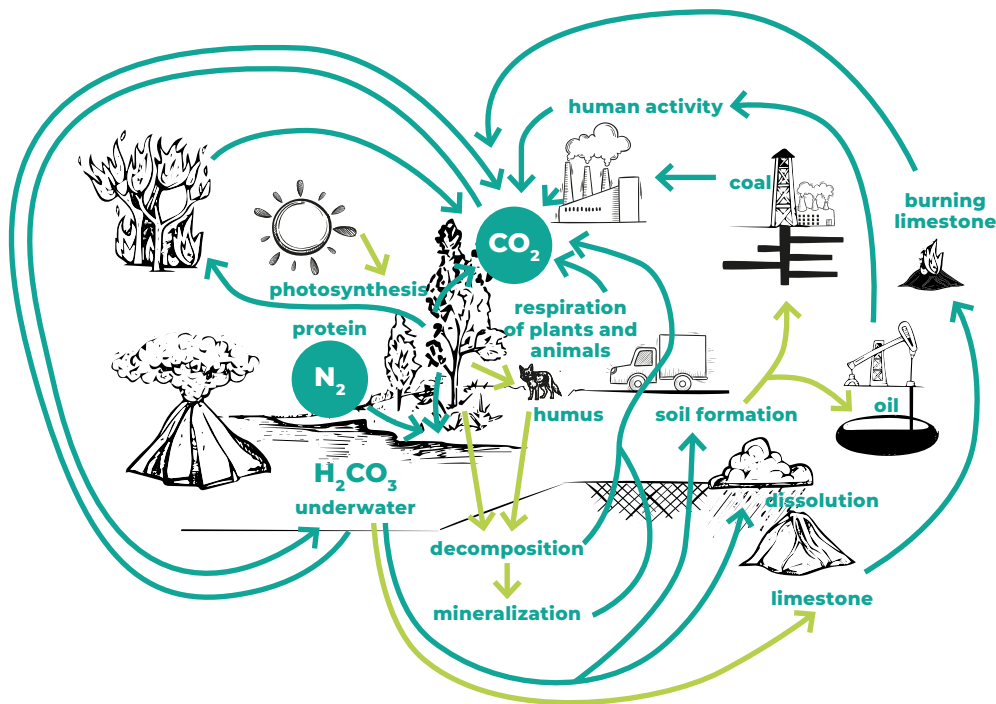
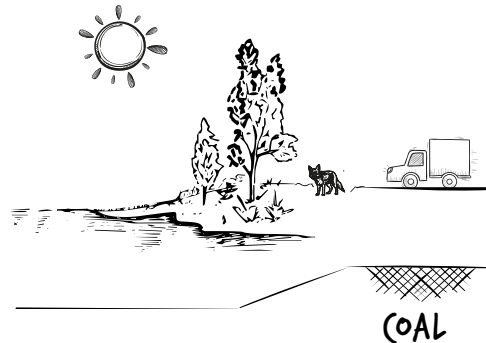
# Expedition report - Answer key - Round 2. 2.11

### Task 4

The contractor sent me the following carbon cycle figure by fax, I have to complete it with the missing elements, text, arrows.

**Score:** maximum 10 points

**Solution:** Scores were given based on the elements of the figures above, and we also took imagination into consideration.



### Task 5

Describe briefly that based on what you have heard so far, what are the pros and cons of buying a used mobile phone.

**Score:** plus task + 5 points

**Solution:** The following solution shows the solution of the "Economists".

- There is less waste, less material has to be disposed of.
- Due to the decreased need for raw materials, mining is also decreased, together with its harmful effects on the environment and health.
- As not so many new phones must be manufactured, packaged, transported, thus energy needs and the impact on the environment both plummet.
- Regarding its function, a used phone is sufficient to make contact.
- It is cheaper!

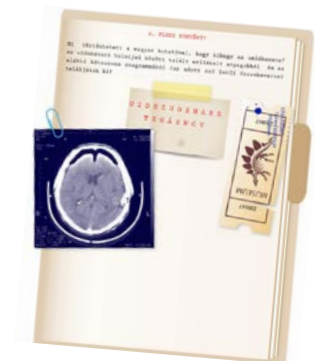
### Task 6 - For extra points:

What might have happened to the lead expert of the expedition that leads to temporary memory problems? Find it out based on his travel stuff found in Ulaanbaatar and on this anagram:

VIDSONAR LONE KEST

**Score:** plus task + 2 points

**Solution:** A *dinosaur skeleton* fell on the scientist's head in the Museum of Natural Sciences of Ulanbataar, and he suffered amnesia.



## GOLD FILE

### WHAT IS GOLD USED FOR?

Gold is a precious metal that possesses exceptional resistance to corrosion. Its remarkable malleability allows for cold forging, making it an ideal material for crafting jewelry and minting coins since ancient times.

Furthermore, it exhibits remarkable resistance to highly concentrated acids, such as hydrochloric acid and sulfuric acid. Gold-containing products continue to be utilized in the treatment of arthritic disorders.

When beaten into incredibly thin sheets, known as gold leaves, it finds application in adorning structures, statues, and other ornamental purposes. Additionally, gold plays a significant role in the electronics industry, being utilized in the production of circuits and surgical instruments. The price of gold is determined in the global market, and its trading takes place on stock exchanges. Moreover, most countries maintain a gold reserve.

It is estimated that approximately 165 thousand metric tonnes of gold have been extracted from prehistoric times until the end of 2014. The color of gold is determined by the composition of its alloy.

### HOW IS GOLD OBTAINED?

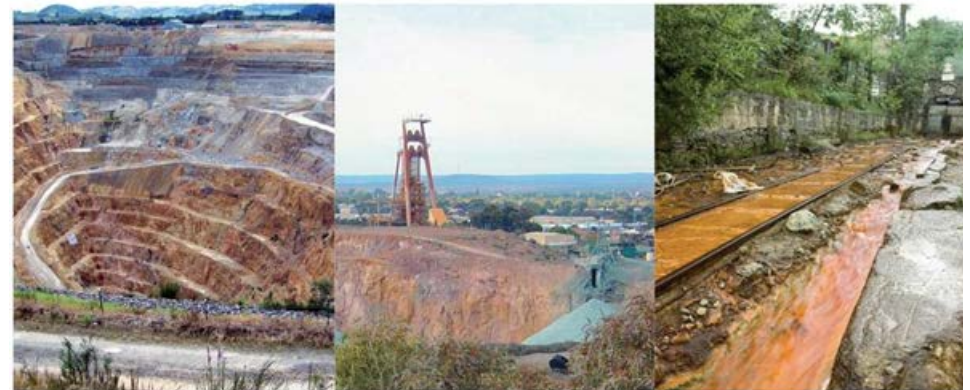
Gold can be obtained through various methods. In its natural state, gold occurs as native gold or within ores, exhibiting an exceptionally high density. Throughout history, people have capitalized on this characteristic of the metal. The process of gold panning involved swirling water, causing gold grains to settle faster (see: gold panning).

From low-grade ores and waste rocks, gold extraction involves grinding them with cyanides in an alkaline medium. The addition of zinc allows gold to dissolve

from the compound. The cyanide process is widely employed in gold production due to its affordability and ability to dissolve gold even from ores with significantly low gold content. The leftover rock material is deposited in spoil tips, while the used cyanide-containing solution, known as toxic tailings, is stored in tailing ponds or dams until the mining operations conclude. Astonishingly, the production of a mere gram of gold generates approximately 4 metric tonnes of waste.

Gold mining involving the use of cyanide is prohibited by law in several countries, including Hungary, the Czech Republic, Slovakia, and two states in the USA, namely Montana and Wisconsin.

The world's most severe cyanide spill occurred in 2000 in Baia Mare, Romania. A tailing dam ruptured during severe flooding, resulting in the destruction of 1200 metric tonnes of fish in the Tisza river and its tributaries. Furthermore, around 2.5 million people were temporarily left without access to drinking water.



### 1. GOLD MINE - ROȘIA MONTANĂ, ROMANIA

According to the plans formulated by the Roșia Montană Gold Corporation (RMGC) in the early 2000s, the multinational company intended to pulverize four mountains into fine rock dust and subsequently leach them with cyanide to ext-

ract gold. This process would generate 215 million metric tonnes of slurry tailings containing sulphuric acid, heavy metals, and cyanide compounds, which would be confined within a valley by a 185-meter-high stone dam without any insulation. There exists a significant risk of approximately a thousand metric tonnes of lead, zinc, arsenic, and other toxic heavy metals seeping into the environment through leakage from this tailing dam. These pollutants could then flow through the Arieș, the Mureș, the Tisza, and eventually reach the Danube. Furthermore, within the mining area, a substantial amount of heavy metal-laden dust may enter the air and, when carried by the wind, could contaminate the soil. Such heavy metals, if accumulated in organisms, have the potential to cause metabolic disorders, cancer, and even birth defects. Astonishingly, the mine plans to utilize 13 thousand metric tonnes of sodium cyanide, a process that produces hydrogen cyanide, a colorless gas considered a chemical weapon. Even a minuscule quantity of 50-60 milligrams of this gas is lethal.

Currently, a settlement exists on the prospective territory of the tailings dam, putting its inhabitants at risk of eviction. Roșia Montană stands as one of the oldest settlements in Transylvania, where Hungarians, Germans, and Romanians have coexisted. It proudly showcases a unique history that dates back to the Roman Age, abundant archaeological discoveries, rare monuments, distinctive settlement patterns, and a rich cultural heritage.

While the mining project would offer employment to approximately 100 people during peak production periods, it would devastate 22 thousand jobs in agriculture, tourism, furniture manufacturing, and the traditional craft sector. Moreover, the principal shareholder of the company has no prior experience in mining, and no one has been willing to provide financial insurance for the project. Consequently, holding anyone accountable or compelling them to pay for damages, if necessary, would prove challenging. The government is expected to bear the economic burdens caused by pollution or accidents.

Despite fifteen years of persistent efforts by RMGC to obtain authorizations, they have been unsuccessful thus far. The Roșia Montană Bill, aimed at facilitating the mining project by removing all legal and administrative obstacles, was permanently rejected by the Romanian Chamber of Deputies. Currently, the mining project is still undergoing the authorization procedure. Local civil societies, as well as international and Hungarian social movements such as the Save Roșia Montană! movement, have played a crucial role in supporting the

locals' advocacy efforts and halting the project. As a result, the use of cyanide mining technologies has been banned in Hungary since 2010.

## 2. OYU TOLGOI COPPER AND GOLD MINE, MONGOLIA (OYU TOLGOI= "TURQUOISE HILL")

Mongolia's economy is rapidly developing due to its abundant mineral and ore reserves. However, despite this progress, one-third of the population still lives in poverty. The country risks becoming an example of sudden wealth accumulation while its inhabitants remain impoverished, a characteristic often referred to as the „resource curse.” As the mining industry grows, agriculture and the craft sector experience decline.



Oyu Tolgoi is one of the largest copper and gold mines, but it remains incomplete. The European Bank for Reconstruction and Development (EBRD), funded by both the World Bank and European taxpayers, intends to grant loans to this mining project situated in the heart of the Gobi Desert. The revenue generated by this endeavor could reach billions for the country. However, the project currently poses significant environmental pollution and renders the lives of local nomads impossible. Mining and transportation vehicles contribute to substantial vibrations, dust, and noise pollution. Furthermore, the mine's extensive water requirements could endanger the local water supply, while also posing risks to the flora and fauna of two nearby reserves. Additionally, it could disrupt the husbandry practices of the local nomads and their migratory animals.



The source of the materials and pictures: verespatak.ro, bancyanide.eu, bankwatch.org, MTVSZ: Aranybánya a fiókunkban (Gold Mine in Our Drawer)

## TIN FILE

### WHAT IS TIN USED FOR?

Tin, a silvery-colored, easily malleable, and ductile heavy metal, finds application in various industries. It is commonly used for soldering in the electronics industry and for tin plating sheet iron, known as tinplate.

Tin plays a significant role in the production of tablets, laptops, mobile phones, TVs, and vehicles within the electronics industry. In nature, tin is most frequently found in the form of a mineral called cassiterite.

### TIN MINING – BANGKA BELITUNG ISLANDS, INDONESIA

With the rapid growth of the electronics industry, the demand for tin has increased significantly. Almost half of the global supply is sourced from the Bangka Belitung Islands in the Indonesian Archipelago. During the mining process, vegetation is destroyed to access tin deposits near the surface. Excavators turn the topsoil, which is then washed down along with the tin-bearing rocks. Unlike open-pit mines that utilize mechanical devices, workers in this region rely on buckets, pickaxes, and even their bare hands. Tin is also extracted from the seabed surrounding the Bangka Islands using ships and drills.

The island of Bangka, located near Sumatra, is home to over one million people. More than half of the population depends on fishing and tin mining for their livelihoods. However, mining activities have resulted in bleak landscapes in many areas. Attempts by mining companies to initiate tree-planting projects have failed due to the acidic pH value of the soil. Several locations suffer from shortages of drinking water and fertile soil. Malaria parasites have even emerged in the abandoned waters of former mining sites. As a result, some inhabitants have moved to neighboring islands or joined the mining industry. In pursuit of better income, many have resorted to amateur tin mining, although this practice is extremely dangerous, with a fatality rate of one person per week. Additionally, there are mines that employ children.

Extracting tin from the seabed also carries severe consequences. The stirring of sandy seabeds by ships and drills destroys coral reefs, which are natural habitats for marine life. Consequently, many local fishers have been forced to close their businesses and seek employment on mining ships, further boosting tin production. The residues, known as slag, also pollute the vibrant biodiversity of mangrove forests.

Major technology companies such as Apple, Sony, Panasonic, Samsung, LG Electronics, and Chinese manufacturers source their tin supply from these islands. In 2013, the Friends of the Earth, an international network of environmental organizations, initiated protests against tin production in the Bangka Islands. They called on Apple and Samsung to investigate the conditions of tin mining in the region. The campaign garnered support from nearly forty thousand customers who urged Samsung and Apple to scrutinize the practices of Bangka tin mines. Samsung admitted to purchasing tin from mines with hazardous conditions. Since then, Apple, Philips, and LG have pledged their commitment to support less harmful methods of tin extraction. Additionally, a „Tin Working Group” involving the Indonesian government, industry, and civilians has been established to promote responsible tin mining.

## LITHIUM FILE

### WHAT IS LITHIUM USED FOR?

Lithium, the least dense and one of the rarest metals on Earth, possesses a global reserve estimated at 13 million metric tonnes. Its primary deposits are found in Bolivia, Argentina, and Chile, forming what is known as the „Lithium Triangle.”

The development of lithium-ion batteries has led to a significant increase in demand for lithium. These batteries are lighter and more long-lasting compared to traditional ones, making them ideal for applications in electric cars, cameras, portable computers, and mobile phones. Lithium is primarily found in salty groundwater and lakes.

### LITHIUM MINING – SALAR DE ATACAMA, CHILE, SOUTH AMERICA

To extract lithium from mineral-rich, salty groundwater, miners pump water into evaporation ponds. Through multiple evaporation phases, the desired concentration of lithium carbonate is achieved, which is then used in subsequent processes.

Two prominent Chilean companies dominate lithium extraction, accounting for 58 percent of the world’s lithium production. Mining activities occur in the northern part of Chile, specifically at Salar de Atacama. The Atacama Desert is one of the driest regions on Earth, with certain areas experiencing as little as 1 millimeter of rain every 5-20 years.





Mining exerts significant pressure on the environment, leading to various detrimental effects. One such effect is the extraction of salty water from the groundwater, which not only decreases groundwater levels but also alters the surface of the salt flats. Unfortunately, the miners allow this water to evaporate from the evaporation ponds without considering the possibility of recycling it. Consequently, pastures and wetlands dry up, posing a direct threat to nesting birds and traditional livestock rearing. Additionally, the use of lorries for transportation contributes to air pollution. Furthermore, if the clouds of rock dust generated during the mining processes reach nearby towns, pastures, or nature reserves, they can cause health problems, pollute the soil, and contaminate water supplies. Moreover, the involvement of previously pristine areas, such as the construction of roads, vehicle traffic, transportation of machinery and workers, and noise pollution, can lead to the extinction of the local biosphere and soil erosion.

While lithium mines provide job opportunities and generate revenue for the economy, it is unfortunate that the locals are limited to low-skilled positions. Skilled jobs are often occupied by foreigners or migrant workers from other parts of the country. This situation hinders the locals from fully benefiting from the economic opportunities presented by the mining industry.

Mining also raises concerns regarding land property and land use. The territory originally belonged to the Atacama nation, and the Atacama Indians consider themselves an integral part of the ecosystem. In their perspective, the territory, as a public good, should not be divided or allocated. The preservation of Salar de Atacama's biodiversity and rich culture owes much to the awareness of the local population. However, it is important to acknowledge that these valuable assets remain in danger despite their resilience.



## LEAD FILE

### WHAT IS LEAD USED FOR?

Lead, one of the earliest known metals, has been utilized in various ways since ancient times.

It served as a fundamental component in numerous paints until the late 1970s. Additionally, it was employed in petrol-based fuels as an anti-knock compound, a practice that still persists in developing countries. Lead finds its applications in batteries, accumulators, pipelines, ceramics, roof cladding materials, and even cosmetics. Despite being banned, traces of lead can still be found in certain toys, such as lead soldiers.

### LEAD MINING – KABWE, ZAMBIA

People affected in lead mining and production: 255 thousand

Kabwe is Zambia's second-largest town. It is one of the six former, prospering industrial centres. In 1902, an exceptionally abundant lead deposit was discovered, leading to continuous extractions until 1994. However, the mines operated without any form of supervision, leaving behind a severely polluted area where lead powder contaminates the soil and water with various heavy metals. Within a 20-kilometer radius of the town, the soil is polluted with lead, cadmium, copper, and zinc. During the operation of the mine, waste was transported through a pipeline to an active smelter.

Presently, due to lenient regulations on water use, many local children swim in the drains, unaware of the contamination. Not only is the water contaminated, but the soil surrounding the town is also polluted with lead powder, which is inhaled by the town's inhabitants. Shockingly, the level of lead in the blood of children living in Kabwe is 5-10 times higher than the health-based limit.

## COPPER FILE

### WHAT IS COPPER USED FOR?

Copper stands out as the most efficient conductor of electricity and heat among industrial base metals. Its prevalence in our lives has increased with the advancement of electronics and information technology, where it serves as a crucial component in copper wires, chips, and various other applications.

Copper plays a significant role in high-efficiency engines, transformers, and copper pipes that transport water into our homes, thanks to its anti-biofouling and anti-microbial traits (e.g., copper sulfate used as a fungicide). Cooks find delight in heat-conducting copper dishes, ensuring consistent heat distribution. Copper's resistance to corrosion, malleability, and recyclability make it a valuable metal. Additionally, when exposed to the elements, copper oxidizes over time, forming a green patina known as verdigris. Currently, 40 percent of the copper demand is fulfilled through recycling, as metals and alloys are identified, sorted, and processed for remelting and utilization in new products.

### FACTS ABOUT COPPER:

Archaeologists have recovered a portion of a water plumbing system from the Pyramid of Cheops in Egypt. The copper pipe was still usable even after more than five thousand years.

The Statue of Liberty in New York is coated with over 80 metric tonnes of copper, extracted from Norway and skillfully crafted by French craftsmen. While copper ore deposits can be found across several countries on all seven continents, the unique case of the Zambian mine necessitated its inclusion in this file.



### COPPER MINES – MOPANI, ZAMBIA

Zambia is one of the poorest countries in the world. Shockingly, one in every three Zambian children does not have access to primary education, and a staggering 68 percent of the 14.5-million population live on less than USD 1 a day. However, despite the dire economic conditions, Zambia possesses abundant mineral resources, and its large-scale mining industry dates back to the late 19th century. Unfortunately, Zambia's heavy reliance on mineral exports has become burdensome. The sharp decline in copper prices during the 1970s resulted in a significant loss of revenue for the country, leading to the accumulation of enormous loans from foreign countries. Subsequently, multinational mining companies stepped in and privatized the mines.

The majority of these mines now belong to Glencore, a mining company notorious for its evasion of mineral royalty taxes and artificial inflation of prices to

# Dig deep - Background material

minimize tax payments. As a result, the Zambian government, along with its population, suffers an annual loss of EUR 88 million due to these illicit practices. In fact, Glencore was awarded the Public Eye Award in 2008, recognizing it as the most irresponsible multinational company of the year.



### THE MINES' IMPACT ON THE LOCALS' LIFE AND NATURE:

- A new extraction method was introduced in the mines. In a nutshell, a sulphuric acid solution is pumped underground to dissolve copper, and then the solution bearing the dissolved copper content is pumped to the surface, where the copper gets extracted. However, this method is not at all harmless, posing significant risks of groundwater pollution, especially considering the proximity of Mofulira's water resources to the mine.
- Thick smoke billows from the chimneys of the copper smelter in Mofulira, with emissions of various pollutants such as sulphur dioxide, arsenic, and lead frequently exceeding the limits set by the World Health Organization. Respiratory diseases are prevalent in the area, and locals describe the air as heavy and metallic. Sulphur dioxide emissions often result in acid rain, which damages crops, soil, and even the walls of houses.

- Numerous accidents have occurred since the mines started to operate, but the most severe incident took place in January 2008 when nearly 800 people had to be hospitalized after consuming and bathing in water contaminated with sulphuric acid, causing months-long skin irritation.
- The production of 1 kilogram of copper generates a staggering 110 kilograms of waste or slag, which is stored in open slag pits near the town. During the rainy seasons, inadequately purified and contaminated water seeps into nearby rivers through underground pipelines from these pits.
- The local population has not benefitted financially from the mine. Dilapidating houses, impaired roads due to heavy mining truck traffic, and hazardous clouds of dust are just a few of the negative impacts. However, the company established a farm for retired miners and implemented health programs targeting malaria and HIV. Despite these efforts, many individuals still struggle with the high costs of education and healthcare.
- Based on the aforementioned reasons, the relationship between the local residents and the mining company is fraught with tension. Residents claim the jobs provided by the mines are "temporary, dangerous and poorly paid."

### BANK AID

The European Investment Bank (EIB), owned by the member states of the European Union and funded by European taxpayers, invested USD 500 million in the Mopani copper mines in 2005. Despite protests from local civil society organizations, the EIB failed to conduct a thorough risk assessment of the project before committing to the funding.

It was only when European civil society organizations joined the protest that the Bank finally ceased its support for the mining company. Furthermore, due to the company's tax evasion practices, the bank no longer provides financing for its more recent mining projects. Even the European Ombudsman has urged investigations into the matter.

## TANTALUM FILE

### WHAT IS TANTALUM AND WHAT IS IT USED FOR?

It is a greyish-white, shining, and easily malleable metal. It is not naturally found in its elemental state, but rather in minerals, with tantalite and coltan being the most important ones.

The following articles offer a fascinating overview of tantalum's applications and the coltan mining industry in the Democratic Republic of the Congo:

<http://cegem.com/index.php/environmental-threats-and-respiratory-health-in-kivu/>

<https://reliefweb.int/report/democratic-republic-congo/coltan-and-conflict-drc>

<https://www.aspistrategist.org.au/the-conflict-mineral-coltan-mining-in-dr-congo-and-australia/>



The source of the lead picture: Harwood, Wright and Yokokoji: Tantalum Memorial, 2008 – in memory of the victims of the coltan wars in the Congo The other pictures: RSN, www.sourcingnetwork.org

## ALUMINIUM FILE

### WHAT IS TANTALUM USED FOR?

Aluminium, the third most prevalent chemical element and the most abundant metal in the Earth's crust (8.13% by mass), is primarily found in small amounts within organisms.

Aluminium is widely recognized as the most commonly used light-weight metal. It possesses qualities such as lightness, shape retention, excellent electrical and heat conductivity, corrosion resistance, and ductility. These characteristics make it highly suitable for various applications. In the construction industry, aluminium's weatherproof attributes make it a popular choice. It is also extensively utilized in aircraft and vehicles. Additionally, aluminium serves as a prevalent material for packaging purposes. It can be found in products such as cookware with aluminium coatings, deodorants, lotions, cosmetics, food additives, and medicines.

### HOW IS ALUMINIUM OBTAINED?

<https://aluminiuminsider.com/red-mud-addressing-the-problem/>

<https://hu.euronews.com/2020/10/04/10-eve-tortent-a-vorosizzap-katasztra-fa-de-a-hatasai-meg-velunk-elnek>



## CARBON FILE

### WHAT IS CARBON USED FOR?

Carbon serves as the fundamental building block of all known forms of life, making it a ubiquitous element found in every organism. Fossilized vegetation or organic matter gives rise to coal, brown coal, and lignite. Carbon finds its primary application in energy production, notably in the generation of electric power through coal-fired power plants, as well as in blast furnaces. Currently, the annual extraction of coal amounts to 5 billion metric tonnes. Other intriguing uses of carbon include radiocarbon age determination, the utilization of graphite for pencil leads, the production of exceptionally hard industrial diamonds for drills, cutters, and abrasives, the common use of charcoal tablets for alleviating stomach discomfort, and the application of carbon, under the name E153, as a food additive.

### HOW IS CARBON OBTAINED? EXTRACTION

Open-pit mining represents the predominant method for coal extraction, although underground mines are also prevalent. Additionally, the removal of mountaintops can expose carbon deposits through the process of mountaintop removal mining. Water is utilized to eliminate non-combustible materials from coal, enhancing its quality through a process known as coal-washing. However, this process generates a significant amount of hazardous waste called coal slurry. This waste is typically stored in impoundment ponds or discharged into water courses following certain purification procedures. Data indicates that mining carbon has adverse effects on human health, as miners often experience occupational diseases that necessitate relatively early retirement. Moreover, the management of waste at mining sites requires thousands of hectares of land, which could otherwise be utilized for agricultural purposes.



### LIGNITE MINE – KOLUBARA, SERBIA

The lignite reserve of Kolubara is estimated to be 540 million metric tonnes, and if all of it were burned, approximately 500 million metric tonnes of carbon dioxide would be released into the atmosphere. Situated just 60 kilometres away from Belgrade, the mine covers an expansive area of 600 square kilometres and plays a crucial role in Serbia's energy supply, as the power plants burning the extracted lignite generate a significant portion of the country's energy. In support of the lignite mine's further development, the European Bank for Reconstruction and Development (EBRD) has agreed to grant EUR 80 million.

The mine holds great significance in the lives of local residents, as a majority of the village's inhabitants are employed either at the mine or the nearby power plant. However, the large mining equipment and transportation vehicles used for coal and dirt hauling contribute to dust and noise pollution, causing structural damage to several houses and disruptions in water and electricity supply. The mining industry has also led to a decline in groundwater levels in the area. Moreover, due to future expansion plans, many locals will be forced to relocate, yet many of them have not received any form of assistance or compensation.

thus far. Pulmonary diseases are prevalent among the residents, and the wastewater from coal washing is often released into the Kolubara river without adequate purification, rendering the groundwater unfit for consumption. The mine has experienced various accidents in the past, including spontaneous coal ignitions that resulted in the release of sulfur dioxide and other hazardous compounds into the air. Additionally, the devastating floods that struck Serbia in 2014, the most severe in a millennium, led to a complete flooding of the mine, necessitating a temporary cessation of operations and causing disruptions in the electricity supply.



### COAL SMOKE CAN HAVE ADVERSE EFFECTS ON HEALTH, INCLUDING:

**Lungs:** pneumonia, chronic obstructive pulmonary disease (COPD), breathing difficulties, impaired lung reflexes, and decreased lung compliance.

**Brain:** reduced blood circulation to the brain.

**Heart:** altered heart function, arrhythmia, and inadequate blood supply to the heart muscle.

**Blood:** altered blood flow, increased blood clotting, peripheral thrombosis, and reduced oxygen-carrying capacity.

**Vascular system:** atherosclerosis, vascular wall diseases, and high blood pressure.

### ROŞIA MONTANA FILE

In Romania, the mining industry operates within the framework of the EU institutional regulations, and the policy instruments are in place. However, there are significant deficiencies when it comes to enforcing regulations and imposing sanctions. The authorities lack the necessary skills, and the insufficient financial resources and lack of environmental awareness pose additional challenges.

The project plan proposed by the Rosia Montana Gold Corporation (RMGC) raises numerous concerns regarding environmental protection, heritage preservation, and the legal, economic, and ethical implications it entails.



### ENVIRONMENTAL EFFECTS

- The company's plan involves grinding up four mountains into fine rock dust and leaching them with cyanide (adding 50-80 mg per liter of water) to extract gold. The resulting waste, 215 metric tonnes of slurry tailings containing sulphuric acid, heavy metals, and cyanide compounds, would be contained within a valley by a 185-meter-high stone dam without any insulation. There is a risk of a thousand metric tonnes of lead, zinc, arsenic, and other toxic heavy metals leaking into the surrounding environment from this tailing dam. Cyanide has the ability to dissolve other heavy metals from the ore, resulting in the creation of toxic compounds.
- Within the mining area, a significant amount of dust containing heavy metals could enter the air, which, when carried by the wind, may contaminate the soil.
- The construction of future mining installations and dams could pose a danger if their construction is flawed, particularly considering the poor track record of the Romanian authorities in terms of inspection, supervision, and reliability.
- Due to the high costs involved, there are doubts about the feasibility of RMGC's proposed solutions, such as the cyanide neutralization station and water recycling plant. Even if they can be built, it is uncertain whether they would effectively improve the situation.
- Mining requires a significant amount of energy.
- In the case of open-pit mining, trees must be cleared from the site. Mining activities can also result in changes to groundwater levels.
- The high risk of air and soil pollution, as well as water contamination, could lead to the deterioration of natural habitats and landscapes.
- Furthermore, if the land is not properly rehabilitated after the mine is closed, there is a risk of soil erosion.



### SOCIAL AND HEALTH EFFECTS

- Heavy metals can penetrate the cells of various organisms, and if they accumulate, they can result in metabolic disorders, cancer, and birth defects. The mine intends to utilize 13 thousand metric tonnes of sodium cyanide annually, during which the creation of deadly hydrogen cyanide gas occurs.
- The expansion of the mine would directly impact 1800 people through forced evictions and relocations. Roșia Montană boasts a unique history dating back to the Roman Age, with numerous archaeological discoveries, rare monuments, distinctive settlement patterns, and a rich cultural heritage, including „protected historical sites.” It stands as one of the oldest communities in Transylvania, where Hungarians, Germans, and Romanians have coexisted.

# Dig deep - Background material

- The residents remain uncertain as they heavily rely on the promised jobs by RMGC, yet they do not support the relocation and fear the environmental consequences. Offering false hope to the residents creates conflicts of interest.
- The valley produces crops that sustain 750 families. If they were to relocate to the suggested areas by the company, their livelihood would be threatened due to inferior land quality. There would be limited space for animal husbandry and agriculture.
- RMGC plans to provide 200 square meter detached houses to those willing to vacate the area. However, it is unlikely that the unemployed or retired individuals would be able to afford the high maintenance costs.



- Presumably, the company will import the necessary materials, technology, and services, which would not contribute to the local economy.
- Most job opportunities at the mine are temporary and come with harsh working conditions.
- The mining project promotes one-sided industrial growth without considering alternative paths. After the mine's closure, the region will face even more disadvantages. Similar to other former mining sites, Roșia Montană will experience severe environmental, cultural, economic, and infrastructural deterioration, as well as widespread job losses and cultural isolation.
- The company lacks prior mining experience and was specifically established to carry out the mining plan at Roșia Montană. Any economic damage caused by pollution or accidents is expected to be borne by the governments of the affected countries.
- Despite fifteen years of attempts to obtain authorizations, RMGC has not been successful due to the mining plan's non-compliance with several laws.

### SOURCES:

[www.verespatak.ro](http://www.verespatak.ro)

[http://www.kincseslada.hu/gaia/e107\\_files/public/verespataki\\_aranybnya\\_egy\\_megjsolhat\\_katasztrfa.pdf](http://www.kincseslada.hu/gaia/e107_files/public/verespataki_aranybnya_egy_megjsolhat_katasztrfa.pdf)

The photo in the middle: Szabolcs Szőke, 2014 (Hay Festival)

### ECONOMIC EFFECTS

- Since the Romanian government provides financial support and exemptions to the mining project, the investment's benefits to the country's economy are limited. The state receives a mere 2 percent of the mine's revenue, while the company has retained 90 percent of it over the past 10-15 years of operation.