... and Activate for Climate

METHODOLOGICAL GUIDE FOR SCHOOLS

CLIMATE CHANGE LIVING LAB

Iceland Liechtenstein Norway grants

Norway grants

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Project “Climate change and environment education centre in Dropie“ supported for additional demonstration measures and educational programmes received a financial contributions 1 200 000 € from Iceland, Liechtenstein and Norway through EEA Grants. The project is co-financed from the state budget of Slovak Republic in the amount of 180,000 €. The aim of the project is to create a demonstration Eco centre in Dropie with implemented adaptation and mitigation measures which will serve the general public.
To find out more about programmes and projects funded by the EEA Grants in Slovakia, you are welcome to visit site:
www.eeagrants.sk or www.norwaygrants.sk

Project partners:

TRONDHEIM MUNICIPALITY

Bjerknes Centre for Climate Research
BCDC Bjerknes Climate Data Centre

SAŽP SLOVENSKÁ AGENTÚRA ŽIVOTNÉHO PROSTREDIA
SLOVAK ENVIRONMENT AGENCY

LIVING LAB DROPIE

CONTENT

METHODOLOGICAL INSTRUCTIONS FOR THE MANUAL

Dear teachers and coordinators of environmental education, this manual was created in connection with the Zatoč s odpadom campaign, which took place in the school years 2021/2022 and 2022/2023. We, therefore, decided to continue in the same style, and this time we are focused on a very hot and current topic - climate. The change of climate has been with us for several years and yet it seems to be distant. Our goal is to make everyone aware that climate change is here and now. Every day we influence it and it has a lot of influence on us, it touches our emotions and calls for action!

Let's believe that the thoughts included in this publication will not only remain in the drawers of cabinets and classrooms, but will get a new meaning through your interpretation, and will reach the students, and also their parents, relatives or friends.

THE STRUCTURE OF THE METHODOLOGICAL MANUAL

The manual consists of 10 topics, arranged from September to June. The topics are purposefully selected according to the important environmental days (IED), that you can implement within different individual activities (Table 1). At the same time, the topics are organized from the general to the specific ones. We focused on the importance of connection between the climate change and our everyday life - from early morning until we go to sleep in the evening. The teacher has the opportunity to customise the activities to the school educational program, to the mentioned significant days or combine them according to their own needs.

Table 1

Overview of topics and important environmental days by months

MONTH	THE NAME OF THE TOPIC AND ITS FOCUS	IED	ICON
September	**Will the air conditioner cool the climate?** • weather, natural greenhouse effect, carbon cycle, importance of trees	World Clean Air and Blue Sky Day (September 7), International Day for the Protection of the Earth's Ozone Layer (September 16)	
October	**ANTHROPOscene** • causes and consequences of climate change, solutions	World Food Day (October 16), International Tree Day (October 20), Native Apple Varieties Day (October 21)	
November	**From the Tatras to the Danube** • situation in Slovakia, consequences of climate change in Slovakia	World Urban Planning Day (November 8)	
December	**Morning will light me up** • water cycle, energy consumption, its connection to climate change and energy saving		

January	**Let‘s mobilise** • transport and its impact on climate change, sustainable mobility		
February	**I‘m COOL at work** • energy consumption at workplace/school and its connection to climate change		
March	**I don‘t shop to feed the bin** • shopping, waste and its connection to climate change	World Consumer Rights Day (March 15), World Recycling Day (March 18)	
April	**I Eat What I Know** • food, food waste, food carbon footprint	World Health Day (April 7), World Earth Day (April 22)	
May	**I Create Islands of Life** • biodiversity and its importance in climate change, pollination, biodiversity in cities and in the countryside	International Day of Biodiversity (May 22)	
June	**I Will Enjoy Today** • how we spend our free time in connection to climate change, travel-ling, shopping, using mobile phones	Day for the Right Decision (June 1), World Environment Day (June 5)	

Each topic about climate contains: 1st a general part and 2nd suggestions for activities.
The general part provides both theoretical and practical information and is structured this way:

You need to know
Key information about the topic and character of the problem.

More on this topic
Sources of used information, as well as links to useful websites, videos, documents, etc.

Let´s go!
A practical challenge that you can implement with the students and thus contribute to solving the given problem.

2030 Climate Target
Key environmental objectives related to the given topic and resulting from strategic documents.

What´s the hold-up?
Searching for reasons why we can’t reach a given goal, and what is the individual’s role in this effort.

The Challenge
The challenge is designed as a sequence of steps. By implementing it, each of us can contribute to solving the problem of climate change. It can be carried out as an additional activity, a homework assignment, a project, or a group challenge for a class or school.
The challenge is suitable for an important environmental day, on the occasion of which you can carry out the challenge and suggested activities together with the students.

Suggestions for activities are divided according to school grades and are indicated by a color code:

- kindergartens - light green
- elementary schools 1st grade - purple
- middle schools 2nd grade - dark green
- high schools – khaki

When creating them, we relied on five key principles of climate education. Inspired by the publication Climate is changing - what about us? Why and how to learn about climate change (MZP CR, 2021):

1. **Be critical** – develop critical and system thinking, dig deeper, see how the iceberg looks like under water, don´t give the only possible solution
2. **Be close and touchable** – study and explore problems in your immediate vicinity, in your neighborhood, town or school
3. **Be visionary** – develop creativity, encourage imagination and vision making
4. **Be active** – take your own part, we don´t need everybody to do everything, but we need each individual to do something easy and practical
5. **Be positive** – work with emotions, strengthen positive feelings and belief in our abilities to be successful

Each activity is processed on a separate sheet that contains:

Worksheet title:

A common name for a set of mutually dependent activities for a given level of school. The activities are designed in terms of the three-phase learning model (evocation - awareness - reflection) and SAZP's own didactic initiatives.

Objectives

The goals of non-formal environmental education and awareness are formulated as key competences, which are filled with activities, and the goals of climate education from the publication Climate is changing - what about us?

Think & Feel (Evocation)

With the activities in this part, we motivate, develop critical and creative thinking, emotional relationship to our environment, empathy, motivation for the environment and its local problems.

Know & Explore (Awareness)

Through the activities in this part, we gain knowledge, form understanding of environmental processes and problems, support the search and research of various solutions and strategies, the ability to express one's opinion and attitude, offer alternatives and positive examples of good practice and get inspiration from nature.

Act & Change (Reflection)

Through the activities in this part, we develop the ability to use the acquired knowledge in everyday life, we focus on the development of communication skills and cooperation, the awareness of one's own strength and the ability to be the actor of change, change and influence one's surroundings.

Handouts:

Various types of aids that are needed to implement the activities (e.g. poems, discussion questions, secretaries, theoretical materials for the teacher, quizzes or worksheets for students). They are described on separate sheets.

LIST OF TOPICS

SEPTEMBER

WILL THE AIR CONDITIONER COOL THE CLIMATE?

Will the air conditioner cool the climate?

You need to know

Our Earth is the planet that enables life as we know it.

Each territory of our planet has its characteristic climate. It is a long-term characteristic weather regime conditioned by several factors, such as air flow, the earth's surface properties (distribution of continents and oceans, surface segmentation, vegetation), and also human activity (deforestation, construction of water reservoirs). Based on the size of the events that create the climate or its spatial extent, we distinguished macroclimate, mesoclimate and microclimate, or local climate. (Encyklopaedia Beliana, Slovak Academy of Science)

We know that the climate of our planet is warming up. We can feel this warming almost every day. As humans, we have a wide selection of ways to cool down. We have a cold drink, an ice cream, take a refreshing cold bath, hide in the shade of a tree, take off our clothes, or turn on the air conditioning which consumes energy. However, our planet cannot just turn on the air conditioning as we do. How does it cool down? It has its own natural regulatory mechanisms that literally work the same as air conditioning. They can lower or raise the temperature. What are these mechanisms?

1. The natural greenhouse effectis related to the absorption of heat radiation by the Earth's atmosphere. We owe this to the presence of greenhouse gases, which prevent the heat escaping back into space and without which the Earth's surface temperature would be about -18 °C and not the current global average of 14 °C.

2. Carbon cycle. Carbon can be found in living and non-living nature. We can mainly find it in minerals, in the marine animals' shells in the ocean. It is bound in mineral resources (oil, coal, natural gas) and in the atmosphere it is represented in the form of CO_2. Green plants (photosynthesis and respiration) play an important role in its cycle. The ocean is also an important factor in carbon sequestration: atmospheric carbon dioxide dissolves at sea level (the colder the water, the more CO_2 it can absorb). On the sea floor it is bound by bacteria. In the upper layers of the ocean it is bound by phytoplankton (algae, cyanobacteria) storing carbon dioxide in its tissues and shells.

3. Forests cover approximately 31% of the total land area of our planet. The tropical rainforests, also called the „lungs of the Earth", can effectively capture CO_2. Unfortunately, disproportionate deforestation to make way for new agricultural land and climate change are causing tropical forests to lose their ability to capture carbon dioxide. Compared to 1990, the Amazon rainforest can absorb only one-third of harmful substances. The rainforests cease to function as the Earth's lungs.

The life of plants and animals and the functioning of the overall ecosystem depends on the climate. And it has changed over millions of years and is still changing. There is a change in the climate - warmer seasons alternate with colder ones and drier ones with wet ones.

However, humans stepped into these long-term processes. As a result of human activity, concentrations of greenhouse gases in the atmosphere have increased, which trap more heat, warming the earth's surface and causing global warming.

Climate change is a change caused directly or indirectly by human activity that alters the composition of the world's atmosphere and that is also observed, in contrast to natural climate changes over a comparable time period. Today, it represents one of the biggest environmental, social and economic threats. John Kerry (US Special Envoy for Climate) said in Jakarta in 2014 that climate change could be the worst „weapon of mass destruction".

No modern invention or gigantic air conditioner can cool the climate of our planet. But we humans do. Through our daily actions, awareness and lifestyle changes.

More on this topic

- ***Czech Television*** – a video with an experiment on the effect of CO_2 on the climate.
- ***Globe*** – interesting activities about the carbon cycle.
- ***Klimatizácia Levice*** – article about the history of air conditioning.
- ***Ministry of the Environment*** – overview of adopted strategic documents on climate change, information on the European Green Deal, mitigation and adaptation measures.
- ***Young reporters*** – an overview of concepts and strategy papers on the climate crisis.
- ***Youth4Climate*** – explanation of the greenhouse effect.

Let‘s go!

2030 Climate Target

To increase the adaptability of forests to ongoing and expected climate change through a comprehensive and holistic approach (Action plan for the implementation of the Slovak Republic Climate Change Adaptation Strategy).

What‘s the hold-up?

Trees are among the most effective helpers in the fight against climate change. They serve many functions. In addition to the aesthetic function, they influence the local microclimate, absorb carbon dioxide (an adult tree can absorb up to 150 kg of CO_2 per year), filter pollutants in the air, provide shade, retain water in the ground, strengthen the soil, etc. Yet we treat them as enemies. We prioritize our economic interests when forests must give way to agricultural land or construction. We do not take care of the trees, we do not treat them, and unauthorized felling or unprofessional interventions resulting in damage or extinction of trees are also frequent.

THE CHALLENGE

Adopt a tree

Each of us has a tree nearby that is close to our heart. A tree that we could stand up for and protect in the event of damage or felling. Trees are our silent friends who give us more than we give them. We must protect them.

1. Choose any tree in your neighborhood. Determine what spcies it is.
2. Adopt it and think about how you will take care of it (beautifying its surroundings, picking up trash around the tree, removing dry branches, placing a birdhouse...).
3. You can also adopt a tree remotely. You can find tips on adopting trees on the Internet.
4. Share your experience about the provided care on ***www.ewobox.sk***.

Envirospektrum, Peter Hazlinger, Tri zdroje života

About the seasons

Objectives:
- Identify the elements of weather.
- Be aware of the changes in nature throughout the year.

Kindergarten

THINK & FEEL

(Evocation)

Together with the children, sit down in a circle on the carpet. Ask them what season it is right now. What other seasons do they know? On the carpet, gradually place pictures of different weather in each season: snow, gale, sun, rain, drought, fog, dew, hoarfrost and others. Gradually ask the children what is in the pictures and whether they have experienced any of those types of weather. Children give answers (yes, no, similar to the picture). Invite the children to sort the pictures into four piles according to the seasons (each in a different corner of the classroom) and evaluate the activity.

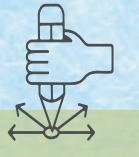
You can go through the correct clothing for the seasons. Watch an animated video about night and day sequence.

KNOW & EXPLORE

(Awareness)

Print the pictures in the **Weather Events** worksheet (in Teaching material) and cut them into cards. Make a board layout of them and play a memory game with the children. For each pair you find, talk about what season it belongs to. Focus on autumn and ask the children what kind of weather is typical for autumn.

Do an experiment on how rain is created. On a 5-litre pickle jar draw together: on the bottom in 1/3 of the glass WATER (which symbolizes a lake, river or sea), then on the top of the glass CLOUDS and SUN. Between water and sun THREE ARROWS upwards and between clouds and water THREE ROWS OF DROPS downwards. Fill the jar with water to the height you marked as water. Cover the glass with a plastic bag and tape it as tightly as possible. Place the jar to sit in the sun. Observe the process of evaporation of water (transformation into gas – water vapour) and its re-liquefaction and falling in the form of drops back into the water.



ACT & CHANGE

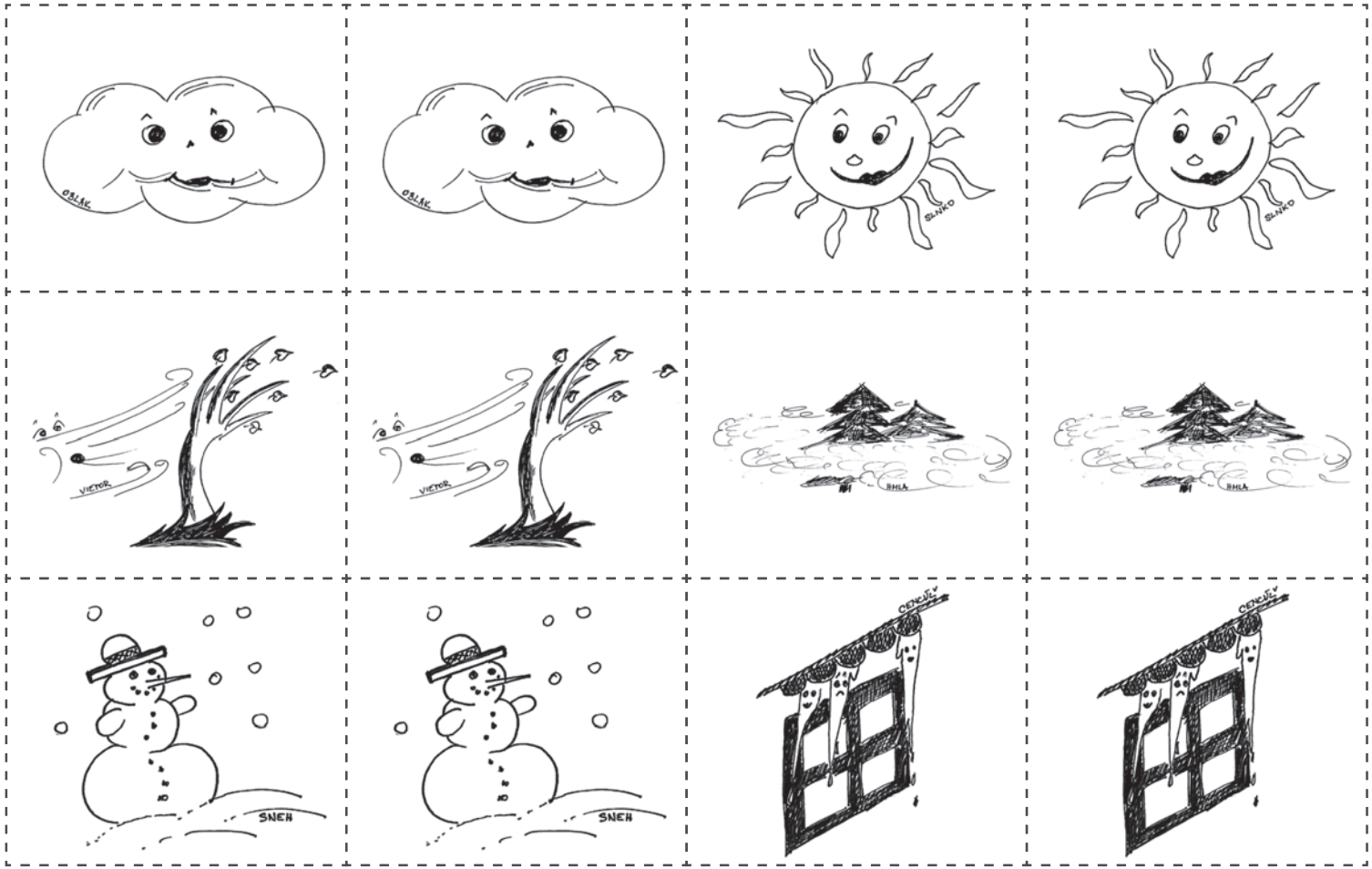
(Reflection)

Craft trees in different seasons. with the children. A roll of toilet paper cut in half and glued to the paper will serve as the tree trunk. Glue pieces of cotton wool for the tree crown and let the children colour it with the appropriate colours according to the seasons.

Have the children colour and cut out the pictures of plants and animals from the **Life Through the Year** worksheet. Talk about which season they would match them to and why. After identifying the correct season, they can stick the pictures to the corresponding tree.

Weather events

Cut out the cards, spread them on the ground and play a memory game.



Life Through the Year

Colour and cut out pictures of plants and animals. Match them with the seasons in which you can find them.

Health and importance of trees

Objectives:

- Know the basic functions of the forest.
- Understand the impact of trees on the planet's climate.
- Sensitivity and respect for nature.

Elementary school

Think & Feel

(Evocation)

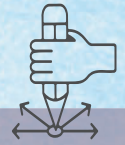
Prepare olfactory and tactile bags containing individual parts of trees (olfactory – cones, needles, leaves, and tactile – branches, leaves, chestnuts, beechnuts, roots). Have students guess what is inside them. Ask them what these items had in common and find out what they know about trees and forests.

Draw a chalk mock-up of a tree in the school yard. The task for students will be to use natural materials to complete the individual parts of the tree (roots, trunk, branches, twigs, leaves) and talk about their functions.

Know & Explore

(Awareness)

Print out the **Tree Functions** pictures from the Handouts, cut them out (without the function name) and hide them somewhere in the school yard area. The students are to find and name them. They can then assign the images to the part of the tree that the given function refers to.
Tell the students that you are going to play the game 'Tree Doctor'. Their task will be to make a "scan" of the trunk of the selected tree using crayons and A4 paper. Then they look around for what they can find under the tree and its immediate surroundings. They are looking for evidence of the health status of the tree. Is it healthy or sick? Does it have any injury? Afterwards, the patient (tree) is examined by sight, touch and smell. Obtained results are written in the **Tree's Health Card** according to the instructions in the Aids and determine the resulting diagnosis.



Act & Change

(Reflection)

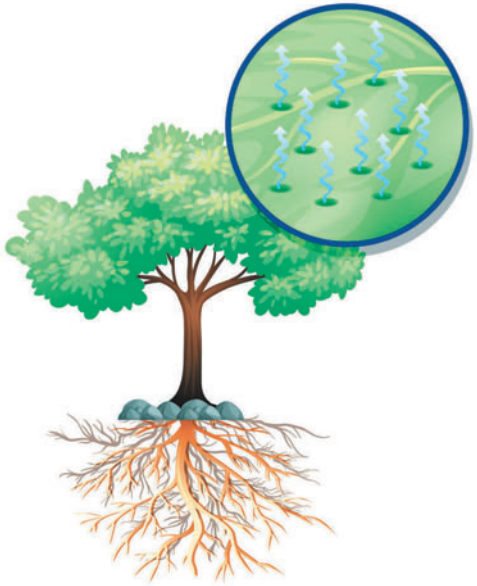
Have students complete the **My Friend Tree** worksheet. Talk to them about how we can heal and protect trees. Don't forget to discuss the word "climate" they deciphered in the crosswords. What does it mean and what does it have to do with trees? Which functions of trees are related to climate?

Tree Functions

Providing shade

Biodiversity boost

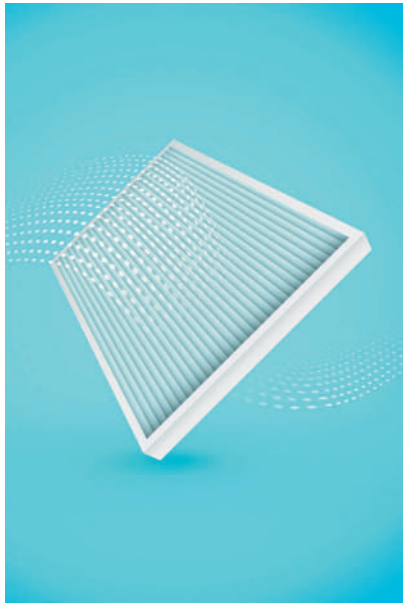
Oxygen production



Improvement of climate

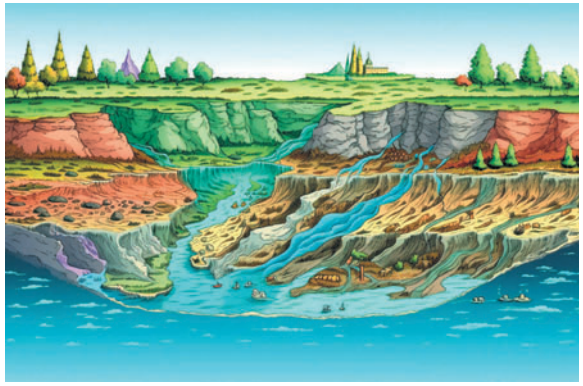
Image source: www.freepik.com

Handouts



Absorbtion of impurities, filtration

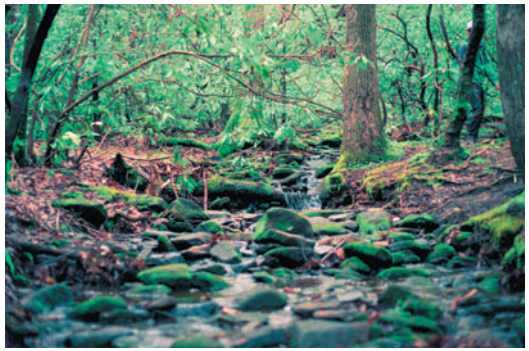
CO_2 absorbtion



Absorbtion of water in landscape

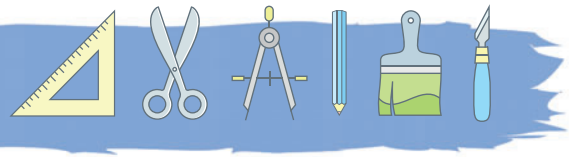
Soil erosion prevention

Soil creation



Improvement of water cleanness

Image source: www.freepik.com



Tree's Health Card

Fill out a health card for your patient – your tree. Underline the evidence found, write the symptoms and establish the final diagnosis.

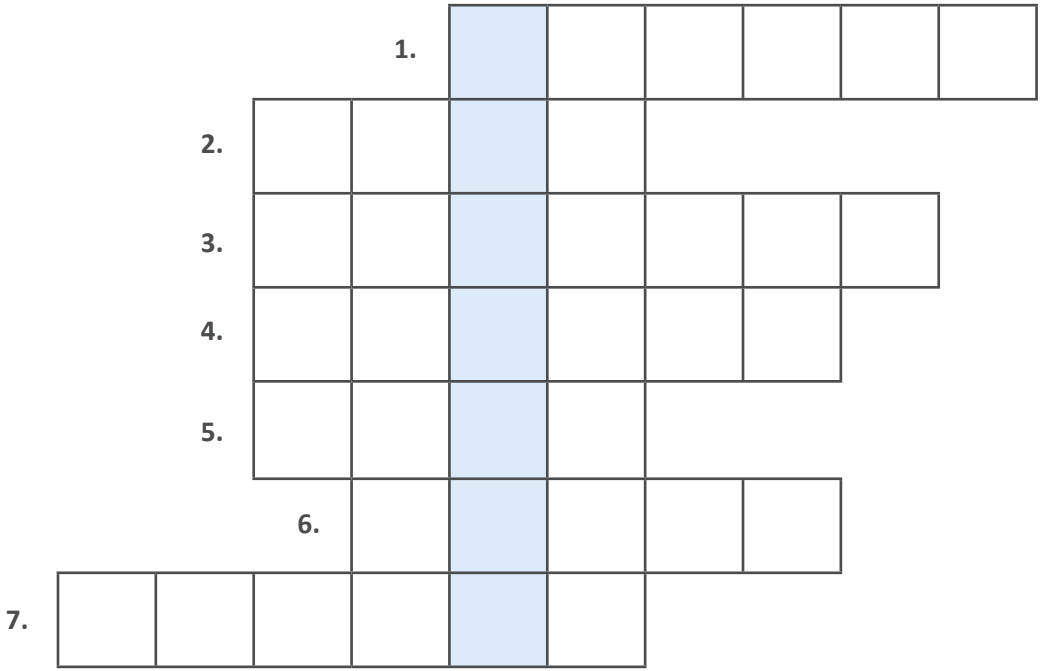
Patient Name: ..... **Tree type:** ..... **Established diagnosis:** .....

Method of examination	Part of a tree	Evidence	Symptoms	Diagnosis
1. Visual check	trunk	cavities with animals (beetles, larvae, worms, centipedes), visible wounds		The tree is old/lightning struck it and created a hollow.
	branches	dry branches, broken branches		The soil around the tree is not very nutritious for the tree, it is not sufficiently aerated due to compaction/ dry weather.
2. Sound check	trunk	cavities, hollow places		The tree is old/lightning struck it and created a hollow.
3. Visual and tactile check	trunk, branches, crown	moss, lichens		The tree is old.
	bark	peeling or missing bark, rotting bark		The tree is old.
	trunk, branches	wounds, oozing resin (sap)		Someone cut the tree manually/the bark cracked because the tree is old/the tree is dried.
	leaves	dry leaves, yellowed leaves, fallen leaves, leaves infected by pests		The tree is healthy / it is infected by pests because it has been weakened / it is getting ready for winter sleep / it is sleeping and drawing strength.
	twigs	fallen, broken branches on the ground		The wind damaged the tree/the tree is dry/it is old.
4. Taste and tactile check	fruits - nuts, apples, pears...	fallen, damaged, rotten fruits on the tree		The tree is infected by pests because it is weakened/old.

My friend tree

Complete the sentences about the weather and make a secret from the words. How is the word from crossword related to trees?

1. Today it´s cloudy and therefore there are many ..... .
2. It I is freezing I´m very ..... .
3. There is always a colourful ..... after the rain.
4. The hottest time of the year is ..... .
5. The air conditioner not only cools, but can also ..... .
6. It rained a lot, there was a ..... all night.
7. The snowflake is a symbol of ..... .



Even trees need a doctor. Write or draw in the box below how would you take care of a sick tree.

Prove the greenhouse effect!

Objectives:

- Clarify the impact of the greenhouse effect on the planet.
- Explain the difference between climate changes now and in the past.
- Understand that my own life has an impact on climate change.

THINK & FEEL

(Evocation)

Talk to the students about the greenhouse effect. Do they know how it impacts life on the planet? Does it harm or help us? Prepare about 10 blankets (or sheets) and form a group of about five volunteers who participate in an animation about global warming. Then place the selected students next to each other and ask them the following questions: Do you have radiators at home? Does your family have a car? Do you travel by bus? Do you use hot water? Do you go shopping? Do you dispose of waste? Do you eat food? Do you wear clothes? Do you have a fridge at home? Do you wash clothes? Do you watch TV? Do you use a computer (and other electrical appliances – iron, washing machine, kettle, microwave, PlayStation)?

For each positive answer, spread one blanket over the group of students. The temperature under the blankets will gradually rise, similar to when we cover the Earth with a layer of greenhouse gases. After all the layers have been placed, ask the students how they feel inside. Release the group from under the warm blankets and talk together about the phenomenon you have demonstrated. The individual blankets represent layers of greenhouse gases that enter the atmosphere mainly through the combustion of fossil fuels – coal, oil and natural gas. Therefore, everything that uses energy from these fuels wraps the planet Earth with another translucent blanket of greenhouse gases and contributes to climate change.

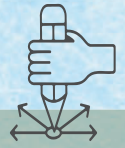
KNOW & EXPLORE

(Awareness)

Conduct a greenhouse effect experiment with the students to demonstrate how the greenhouse effect overheats the Earth. Divide the students into groups. For each group, prepare two thermometers, a glass container large enough to cover one thermometer (e.g. a glass mason jar), a lamp with a high-brightness light bulb, stop-watch, grass sod (a grassy surface with soil). The container will represent the gases and clouds in the Earth's atmosphere, the lamp is the Sun and the grass is the Earth's surface.

Turn the glass container upside down, place it on a grassy surface and insert one thermometer into it. Shine a lamp in close proximity to the container. After a certain period of time, measure the internal temperature in the container and the external temperature outside it using a second thermometer. Repeat the measurement several times in a row and compare the temperatures. What conclusions can be drawn from this experiment? Is the greenhouse effect good or bad? Why? Emphasize to students the difference between natural and anthropogenic greenhouse effects caused by human activity.

(Source: https://stromzivota.sk/)



ACT & CHANGE

(Reflection)

For revision, watch some of the short videos on YouTube - The Greenhouse Effect od U.S. Environmental Protection Agency.

Have them complete the **Natural Greenhouse Effect** worksheet and evaluate it. Ask each student to share one idea of how they can contribute to reducing the production of greenhouse gases and thus mitigating climate change.

Natural Greenhouse Effect

Add the processes taking place within the natural greenhouse effect to the boxes.

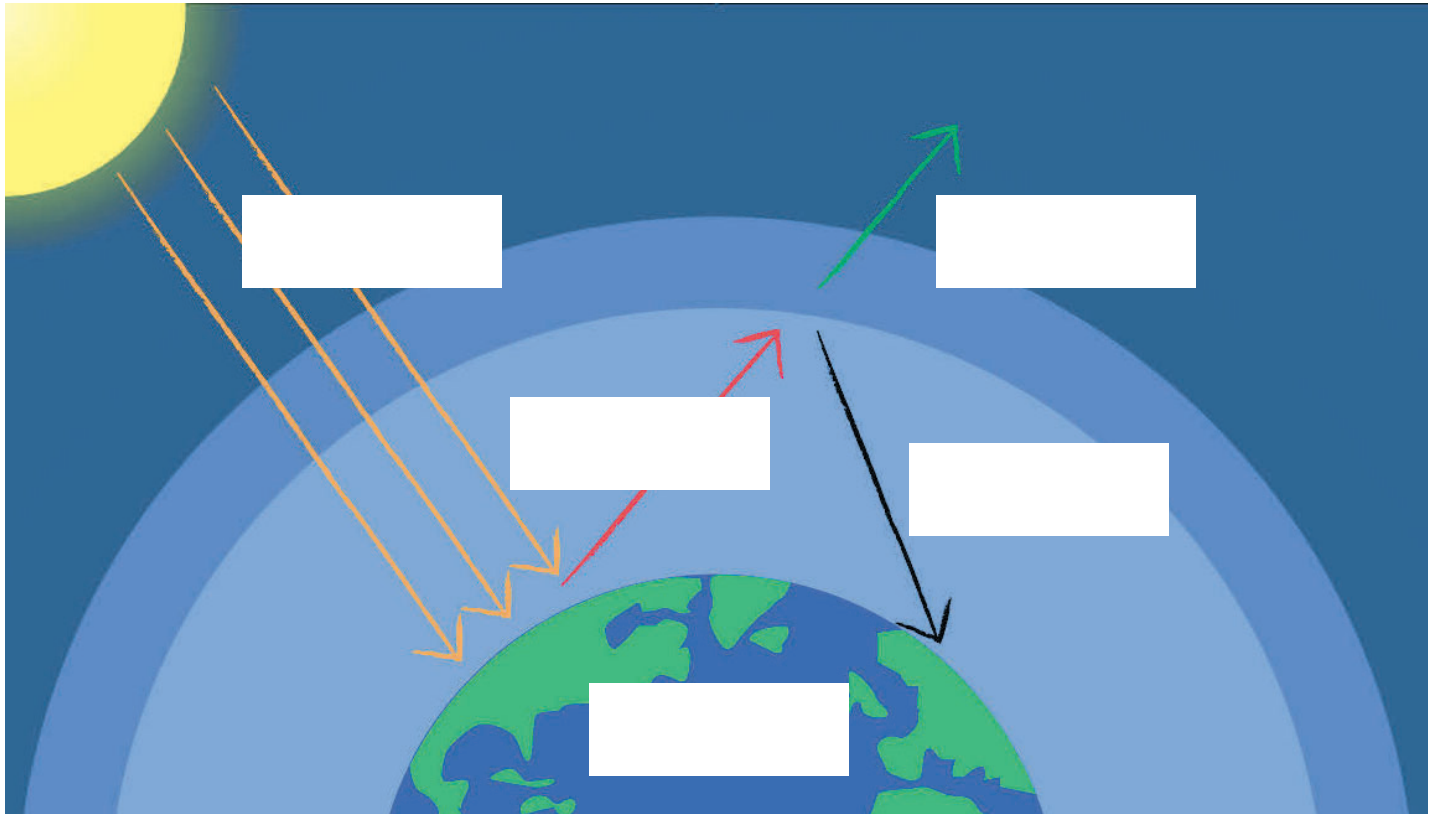


Image source: storyboardthat.com

The sun's rays enter the atmosphere and heat the Earth

Some of the heat is absorbed by greenhouse gases and remains in the atmosphere.

Some of the heat reflects from the Earth's surface.

Some of the heat escapes back into space.

As a result, our planet is warming.

Carbon Detective

Objectives:

- Understand local and global ecological phenomena and their role in everyday human life.
- Know what measures mitigate climate change.

THINK & FEEL

(Evocation)

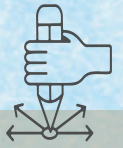
Divide the students into groups. Ask them what makes up the basic building block of all organic compounds *(Carbon)*. The student groups are to write as many names of compounds with carbon as possible in 5 minutes. Each group then reads their list. Together, check the answers and identify the compounds that cause climate change *(methane, carbon dioxide)*.

KNOW & EXPLORE

(Awareness)

Watch with the students the Carbon cycle video. Divide the students into groups again, giving each a poster and flashcards from the **Carbon Cycle** worksheet (in Handouts). Their task will be to correctly fill in the individual parts of the carbon cycle (cards) in the empty fields on the poster. What is the significance of carbon cycle for humans?

Afterwards, each group will creatively design the carbon cycle according to the following (or a similar) assignment: 1. Sketch your own cycle or concept map. 2. Create engaging advertising/anti-advertising. 3. Compose seven quiz questions (each with three choices); 4. Create a poem, story, song or rap. After the time limit, the groups will present their cycle designs.

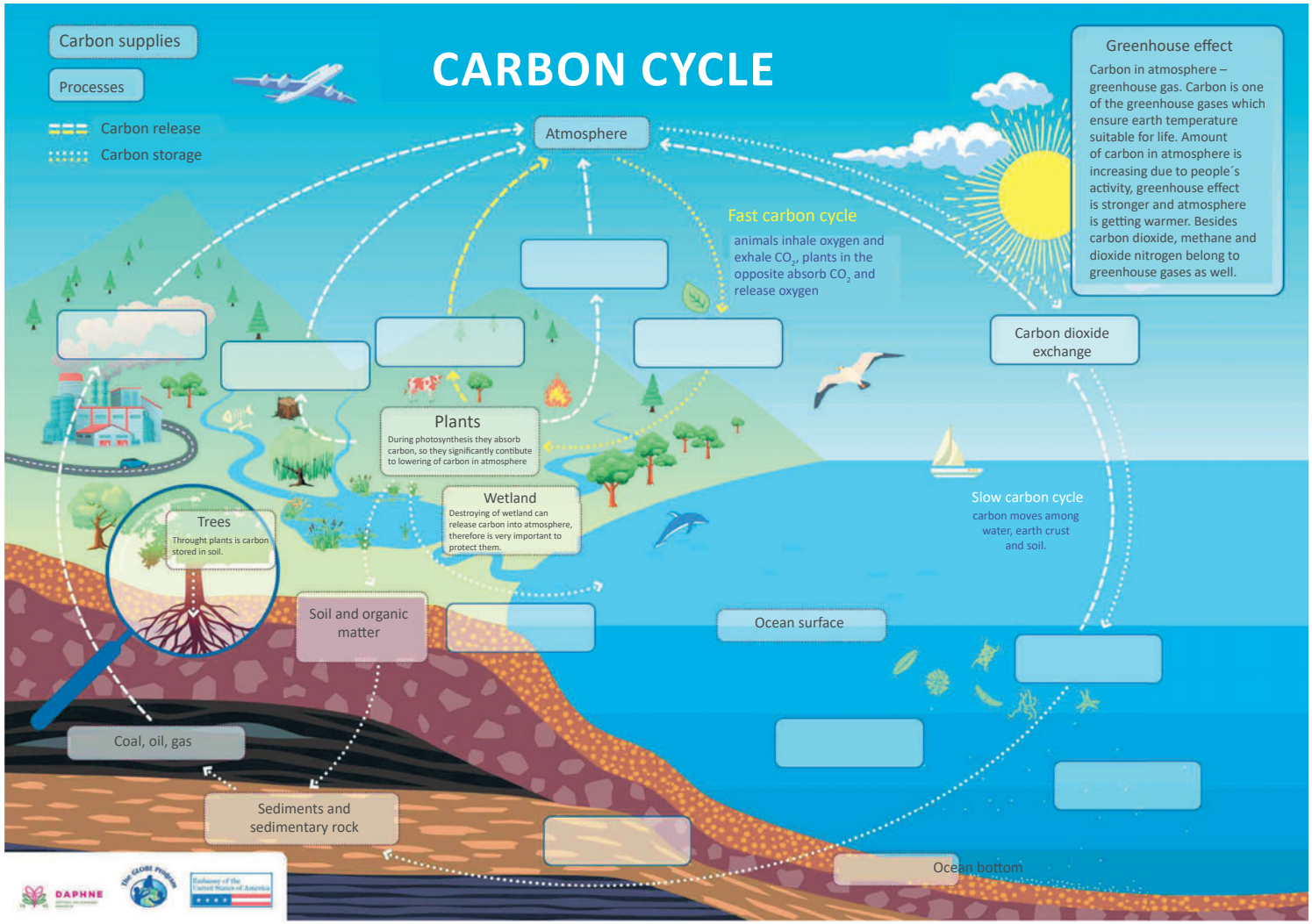


ACT & CHANGE

(Reflection)

Play NASA's How the Earth Breathes - animation showing the students the correlation between seasonal vegetation cycles and the concentration of carbon dioxide in the atmosphere. What conclusions can the students draw from the animation? Discuss the links between the carbon cycle and climate change.

is sequestration. Let the students find out the possibilities of removing carbon from the atmosphere and depositing it in the soil (afforestation, forest restoration, protection of primaeval forests and wetlands, planting of biodiverse meadows, grassing of arable land or so-called *carbon farming*).



Source: projekt Globe, Daphne Bratislava

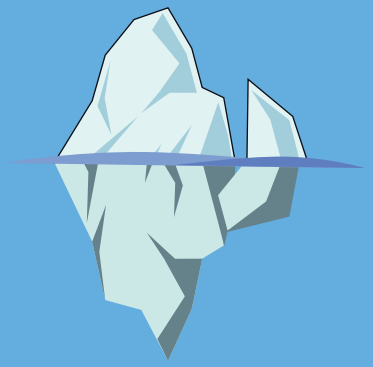
Carbon cycle

Complete the individual parts of the carbon cycle.

- Burning
- Burning fossil fuels
- Respiration
- Photosynthesis
- Decay
- Weathering and run off
- Phytoplankton
- Deep circulation
- Sinking sediment
- Rock formation

OKTOBER

ANTHROPOSCENE



ANTHROPOscene

You need to know

The geochronological period in which humanity lives today is informally called Anthropocene. "It is the age of humans and a new geological epoch in which human activity has become the dominant force shaping the planet." (Source: UNDP 2020)

The Anthropocene way of life has many characteristics, such as industrial activity and technology development, urbanization, deforestation, land degradation, water pollution, air pollution, climate change, and species extinction. Human activities and their effects comprehensively affect the biosphere and ecological balance and cause many environmental problems and threats.

The Anthropocene is characterized by two phenomena, firstly, the trend of exponential civilization growth (population growth from 1 billion to 8 billion in less than 200 years), and secondly, the so-called human-caused environmental transformation on a global scale disrupting planetary biogeochemical cycles and excess greenhouse gases destabilize the Earth's naturally regulating climate.

The consequences of this destabilization are manifested everywhere in the world in extreme weather events (floods, torrential rains, hail, tornadoes, rising sea levels due to melting glaciers, rising sea temperatures, extreme drought and heat inland, forest fires, etc.). More and more settlements do not have access to drinking water and land degradation reduces their ability to grow food. Huge numbers of people forced to leave their homes due to climate change are mobilizing.

Globally, 60% of people live in cities. Settlements, with their concrete surfaces, factories, transport, utility networks, incinerators, heating plants, and consumers, form a network of heat storages. Supply, an additional infrastructure, is connected to this network through which cities are supplied with the necessary resources and means for their insatiable growth.

Cities are growing vertically and horizontally. New road networks and infrastructures are constantly being built and expanded. Greenness and biodiversity are decreasing worldwide. We transform surfaces outside settlements (we cut down forests, create unimaginably large plantations and farms for food production, extract minerals and precious metals, drain the landscape with flow regulations) and push other organisms often to the brink of extinction. The situation we are heading towards is similar to the Boiled frog syndrome in gradually heating water.

Changes we make in the Anthropocene to flora and fauna are on a global scale. Non-indigenous species of plants and animals are expanding, and with climate change pests occure whose negative consequences are becoming more and more intense (e.g. walnut husk fly, European spruce bark beetle, Asian tiger mosquito, Asian Lady Beetle, etc.).

"We are the first people to live in an age, in which dominant risk to our survival is ourselves." (Source: UNDP 2020)

In the Anthropocene, we are rushing to find the correct procedures and solutions for cooling the planet. Using the implementation i.e. mitigation and adaptation measures, we are provided with various forms and procedures to mitigate climate consequences or to adapt to them at the international, national, and individual levels. International efforts (e.g.: The United Nations Framework Convention on Climate Change, the Conference of the Parties to the United Nations Framework Convention on Climate Change, the Conference of the Parties to the Kyoto Protocol and the Conference of the Parties Serving as the Meeting of the Parties to the Paris Agreement) assist member states in developing and implementing national strategies and programs for the implementation of such measures.

Various modern technologies and directions are created through joined research and development. One of them is CCS technology (Carbon Capture Storage) for capturing and storing carbon from the air, alternative fuels such as biofuels, the transition to a circular economy and others.

Various projects supporting civic activism (Envirorekord 2017 – "Trees to the Landscape" (Slovak: Stromy do krajiny), "Slovakia Cleanup" (Slovak: Upracme Slovensko) encourage social responsibility, restoring people's relationship with their immediate surroundings but also the local community. These projects do not generate profit, but they create values of a non-monetary nature beneficial to our community - for example, planting trees or meadow strips in the city create better living conditions. It is a slow but effective way of adapting to climate change and its negative effects.

Nature selflessly provides us with its services. Voluntary activities can serve as a space to implement corrective measures. Every effort we make (adaptation or mitigation) today or tomorrow will probably bring its fruits only for the following generations. However, every day, every deed and every decision counts.

"The courage does not arise from words but from the right choices." Antoine de Saint-Exupéry

More on this topic

- Anthropocene or How to Return to Earth – an article (in Slovak) in the Mloki online magazine
- American Museum of Natural History – a video about the evolution of human population
- Enviroportal – information on the UN Framework Convention on Climate Change
- When The World Gets 1°C Hotter – a short video about climate change
- Human Development and the Anthropocene – EWOBOX article on Human Development Report 2020 - Next Frontier: Human Development and the Anthropocene
- Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050 – measures by individual sectors
- Oneearth – a database of successful projects around the world implemented by local communities
- Populationmatters – counter of the current state of the world population
- Sagarika Sriram – Dubai activist and her video for youth engagement
- Startlab – project financing from public voluntary donors

Let's go!

2030 Climate Target

Strengthen food self-sufficiency by linking to the preference for local foods, which often have a smaller emission footprint, mainly as a result of transport (Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050).

What's the hold-up?

Around 15,000 varieties of apple trees are bred worldwide. We have approximately 300 of them in Slovakia. However, we only find a few types in stores and most of them are imported from abroad. People prefer to buy a shiny foreign apple rather than a Slovak one. Paradoxically, this is often due to a lower price, imperfect appearance or people's reluctance to find out information about the origin of food.

THE CHALLENGE:

Choose locally

Choosing the perfect apple is not easy. They differ in smell, taste, and appearance, but mainly in the carbon footprint they create during transport. Many varieties of apples are bred for a specific purpose - for example, for direct consumption, production of drinks or concentrates, or storage for the winter months. What are your favourite apples?

1. Take a photo of your favourite apple.

2. Find out where it comes from. Who grew it and in which nursery? Is it from a domestic grower? Who brought it to Slovakia? How far did it travel to get here? What is the growing history of your favourite apple?

3. The next time you go shopping, pick a locally grown apple, go to the market or buy from local growers.

4. Share story of your favourite apple on www.ewobox.sk

Envirospektrum: Senja Trungelová, Odraz prírodnej krásy

In the City

OBJECTIVES:

- Acquire the abilities and skills needed to explore nature and the environment.
- Understand the difference between natural and synthetic things right on our doorstep.

THINK & FEEL

(Evocation)

Prepare examples of natural objects (leaves, grass, lichen, stones, etc.) and artificial objects (plastic bottles, books, mugs, etc.). Select a few volunteers. Blindfold each person and put in their hands one natural thing first, and then one artificial object. Their task is to describe the properties of the object they are holding. When everyone has taken turns, sit in a circle. Together, try to figure out the differences between the things being studied and name them (*natural versus man-made things*).

KNOW & EXPLORE

(Awareness)

Divide the students into groups. Give each group a different type of construction kit (e.g. wooden or foam blocks, Lego). The task of each group will be to build a city and include everything they think should be in it. When all the groups have introduced their cities, ask them the following questions: Do you have a place in your city where you can hide, sleep, and rest? Where do you get food and water from? Are there roads in it and if so for what means of transport? What is artificial (man-made) and what is natural in your city? What natural elements should the city have or would children like to have? Discuss the importance of natural elements to city life.

ACT & CHANGE

(Reflection)

Go for a walk with the children to the kindergarten grounds or its surroundings. Gradually task them with distinguishing between natural and man-made objects, for example: Grab something red and artificial. Bring a natural part of some plant. What is the tallest natural thing you can see? Describe one natural and one artificial sound you can hear.

Together, identify all artificial and natural elements around your kindergarten. Which ones did we find more of? Talk to the children about whether they would like to add more natural elements to the area and which ones in particular.

Let the children complete and evaluate the **My City** worksheet.

My City

Connect the lines and build your own city. Then draw the natural elements that you would like to have in your city and colour them.

Tomato battle

OBJECTIVES:

- Consider consumer decisions and their impact on the climate when shopping.
- Know how to defend sustainable consumer behaviour.

THINK & FEEL

(Evocation)

Ask the students this puzzle: On top of my head is a green hat. My cheeks are bright red and I go with bread. My friend is a potato, but I am a... (tomato). (Source: FB Farma Kameničany)

Cut different types of tomatoes (from Slovakia, Spain, Hungary, home-grown tomatoes) and let the students taste them. Cut out pictures of **tomatoes** from the Handouts and together try to guess where these tomatoes come from (*Happy Tomato (Slovak: Veselá paradajka) – from Slovakia, Torro – from Spanish Almeria, "Čípoš" – from Hungary and Couch Tomato (Slovak: Domasedka) – grown at home*). The students' task will then be to match the pictures to the corresponding tomatoes. Did they know where the tomato comes from by taste? Which tomato did they like best and why? Does the taste of a tomato have anything to do with the country in which it was grown? What kind of face would the students draw for the Couch Tomato?

KNOW & EXPLORE

(Awareness)

Take the students for market exploring. Your task will be to find out where the tomato varieties sold come from. How many countries do tomatoes come from? How many varieties were there from Spain, Slovakia or neighbouring countries? Buy one piece/pack of each variety and mark them (for example, with the state flag).

Divide the students into groups and give each one a picture of **the Garden of Europe** cut into pieces (in Handouts). The task is to assemble the whole picture from the cut parts and guess what is on it. It is the "plastic garden" of Europe in the Spanish town of El Ejido , where tomatoes, cucumbers, peppers, lettuce and other types of fruits and vegetables are grown in plastic greenhouses. Bring up Google Maps on the interactive board and explore the area closely with the students. How is it possible they can grow tomatoes in the desert? What does growing tomatoes under plastic cover have to do with the local climate? *(According to NASA data plastic greenhouses changed the local climate. While the world, including Spain, is warming overall, the peninsula near Almeria has cooled by one degree since the 1970s, as the plastic greenhouses reflect sunlight. What negative consequences does such a method of growing vegetables and fruits bring? (In a place with low rainfall = increased water consumption, import of vegetables from the area = increased emissions, use of artificial fertilizers = change in soil functions to capture water and carbon.)*

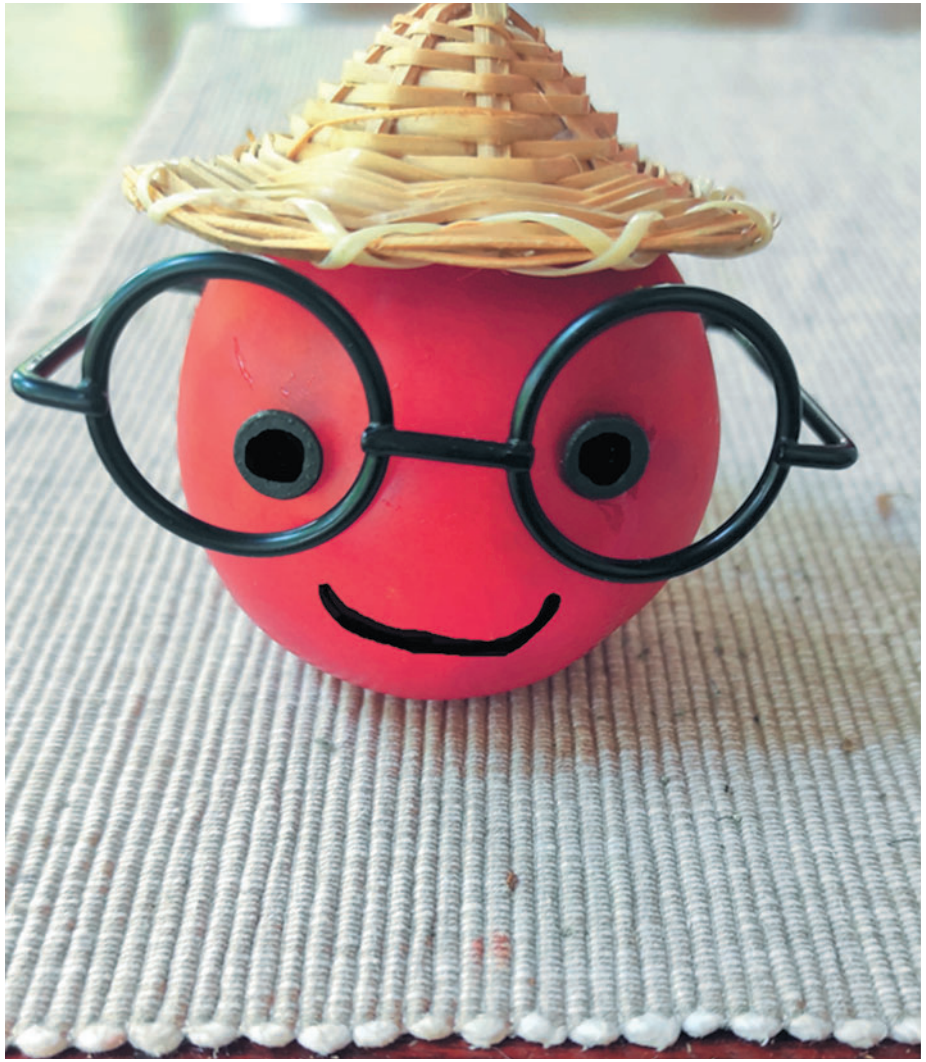
ACT & CHANGE

(Reflection)

Experiment with tomato varieties from different countries based on the Tomato Slice to Seeding Time Lapse video. Cut two slices from each tomato. Put one in a plastic bag and the other in a glass container with garden substrate and water it. Leave the tomatoes in a dry place, not in direct sunlight, and watch what happens. Are there any differences between tomatoes by country of origin?

If the students were to give shopping advice to their parents, which tomatoes would they recommend and how would they justify it? Encourage them to speak about it at home.

Tomatoes



Happy Tomato

Torro Tomato

Images by: Veronika Pogányová, SEV Dropie

Tomatoes

Čípoš

Couch Tomato

Images by: Veronika Pogányová, SEV Dropie

Garden of Europe

Source: https://lepsiageografia.sk/rubriky/plastova-zahrada-europy/

Climate Heroes of the Anthropocene

OBJECTIVES:

- Describe the impacts of climate change on ecosystems and human life at local and global levels.
- Be able to express your emotions related to climate change.
- Ability to lead by example, inspire and motivate to protect the environment and solve SD problems.

THINK & FEEL

(Evocation)

Write the word Anthropocene on the board. Ask the students if they know what it is and explain the concept to them. Have them think of a word related to the Anthropocene and climate change for each letter of the word.

Have the students complete the **Timeline** worksheet, evaluate it, and discuss the most significant events in our history that changed the Earth. You can find the sheet and the correct answers in the Handouts.

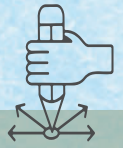
KNOW & EXPLORE

(Awareness)

Play the World Conference on the **Impacts of Climate Change** role play. Print out a role and the task chart for each student. You can find the materials in the Handouts. The students will make a name tag with the name of their character and put it on their chest. Give them space to go over their role and get into it. They can close their eyes and imagine where they live. What does their typical day look like? What problems do they have? Props for individual characters will also add variety to the game.

After studying their roles, everyone meets at the conference. Everyone finds a partner and shares their story (they should embrace their character and talk in the first person). They gradually get to know more and more people at the conference and at the same time fill in a table in which they write down the names and stories of the people they met at the conference for individual tasks.

After the allotted time, ask the students to form a line - there will be the people negatively affected by climate change at one end of the line, and at the other end there will be those who benefit from climate change. Talk about why they lined up in such order, how they felt during the role play, and what they realized.



ACT & CHANGE

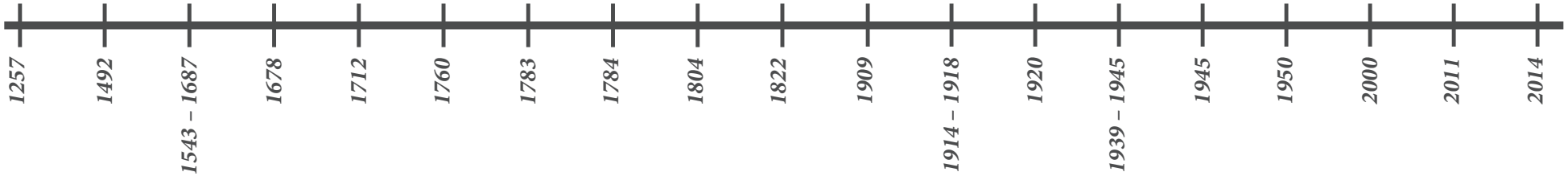
(Reflection)

Talk to the students about the term 'Climate Hero'. How do they imagine such heroes look like? Are they humans, artificial intelligence, bacteria or plants? Did they live in the past, do they live in our time, or are they from the future? Do they have any special powers? According to the students, what does such a Climate Hero know and what can he do? What are his characteristics? Which character from the game do they think is the real hero?

Have the students finish the **Consequences and Solutions** worksheet using the information from the game. Evaluate it together.

Timeline

Match the years with important events related to Earth's transformation and the Anthropocene.



"Scientific Revolution" – Development of modern science (discoveries in mathematics, physics, chemistry, biology, astronomy) that changed the view of nature and society

Discovery of America and colonization

Eruption of Gunung Samalas volcano (Lombok, Indonesia) – beginning of the Little Ice Age.

Invention of the first commercial steam engine (Thomas Newcomen)

The beginning of the Atomic Age – the first test explosion of a plutonium nuclear weapon, the detonation of the first nuclear bomb (the "Trinity Test")

Industrial Revolution

Use of coal as the main source of energy

The eruption of the Laki volcano in Iceland caused one of the largest climate catastrophes of the last millennium

American chemist Thomas Midgely and his colleagues created various chemical compounds, including freons – chlorofluorocarbons (CFCs).

Improvements to the steam engine (James Watt)

Great acceleration due to post-war industrialization, exacerbated by deforestation and road construction

The world population reaches 1 billion

Invention of the Haber-Bosch synthesis (artificial nitrogen fixation process – basis for the industrial production of ammonia and fertilizers)

World population reaches 7 billion

First World War

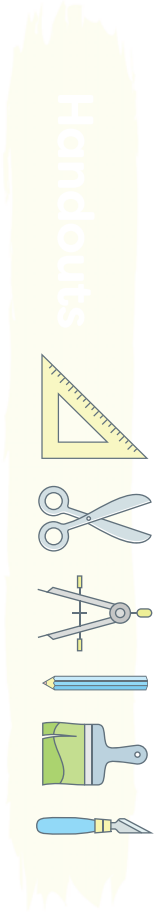
Second World War

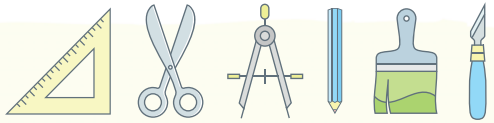
Invention of the electric motor (Michael Faraday)

Paul Crutzen and Eugene Stoermer published an article arguing that we live in the Anthropocene

The CO_2 content in the atmosphere reaches 400 ppm

1257	Eruption of Gunung Samalas volcano (Lombok, Indonesia) – beginning of the Little Ice Age.
1492	Discovery of America and colonization
1543 – 1687	"Scientific Revolution" – Development of modern science (discoveries in mathematics, physics, chemistry, biology, astronomy) that changed the view of nature and society
1678	Use of coal as the main source of energy
1712	Invention of the first commercial steam engine (Thomas Newcomen)
1760	Industrial Revolution
1783	The eruption of the Laki volcano in Iceland caused one of the largest climate catastrophes of the last millennium
1784	Improvements to the steam engine (James Watt)
1804	The world population reaches 1 billion
1822	Invention of the electric motor (Michael Faraday)
1909	Invention of the Haber-Bosch synthesis (artificial nitrogen fixation process – basis for the industrial production of ammonia and fertilizers)
1914 – 1918	First World War
1920	American chemist Thomas Midgely and his colleagues created various chemical compounds, including freons – chlorofluorocarbons (CFCs).
1939 – 1945	Second World War
1945	The beginning of the Atomic Age – the first test explosion of a plutonium nuclear weapon, the detonation of the first nuclear bomb (the "Trinity Test")
1950	Great acceleration due to post-war industrialization, exacerbated by deforestation and road construction
2000	Paul Crutzen and Eugene Stoermer published an article arguing that we live in the Anthropocene
2011	World population reaches 7 billion
2014	The CO_2 content in the atmosphere reaches 400 ppm





World Conference on the Impacts of Climate Change

Wangari Maathai

Green Belt Movement, Kenya

Africa is the continent that will be hit the hardest by global warming. Unpredictable rains and floods, prolonged drought, crop failures, and fertile lands turned into deserts have already begun to change the face of Africa. The continent's poor and vulnerable will be hit the hardest. Already, some places in Africa are seeing temperatures rising twice as fast as world averages.
Wealthy countries will be affected, too. But for us, this is a matter of life and death. What makes this so outrageous is that our output of greenhouse gases is tiny when compared to the industrialized world's output. So the industrialized nations need to raise steady and reliable funds for the main victims of the climate crisis: the poor throughout the world.
We have mobilized millions of individual citizens in every country to plant trees, prevent soil loss, harvest rainwater, and practice less destructive forms of agriculture. We must protect the trees from the logging that is turning our continent into a desert. Our goal is to plant a billion trees. We will do our part to save the planet, but it is the rich countries that are the most responsible.

Chris Loken

Apple grower, Hudson Valley, New York

Everybody is saying awful things about global warming, and I know that it's bad for a lot of people. But recently Fox News did a report on climate change "winners" and they came to talk to me. As they said in their report, "There are some upsides to global warming." That's true. Frankly, I saw this coming. I knew that things were going to get warmer and you know what they say about a crisis: It's also an opportunity.
I live in a beautiful place. Rolling hills. Good for apple trees. But I decided to diversify. Right next to the apples, I planted peach, apricot, and plum trees. Five years ago. As I say, I saw this coming. These trees wouldn't have survived the winters of the old pre-global warming days. But our winters are getting milder, and I'm betting my trees will do just fine. As I told the Fox News people: "This farm here has been set up for the future." It's not easy running a farm these days, and if the weather decides to cooperate a little bit, who am I to argue? I'm sorry for those folks who are hurt by all this, but I've got to think of my family.

Enele Sopoaga

Prime Minister, Tuvalu

Most people have never heard of my little island that is 650 kilometres from Fiji in the South Pacific. Tuvalu has 10,000 people in a place that averages just six feet above sea level. My people live on fish and fruit; everyone knows their neighbours and people don't even lock their doors.
Rising sea levels, caused by global warming, threatens the very existence of my land and people. Beginning in 2000, at high tide the water began covering places on the island that had never before been covered in the memory of even the oldest residents. In August 2002, the entire island flooded and the increased salinity [salt] has forced families to grow their root crops in metal buckets instead of in the ground. Many people believe that if current trends continue, there will be no more Tuvalu in less than 20 years.
The former prime minister of Australia said that if Tuvalu disappears, people should be relocated elsewhere. What incredible selfishness. How can anyone say that people in Tuvalu should suffer so that people in the so-called developed world can continue to fill our atmosphere with carbon dioxide by driving their big cars and buying stuff made halfway around the world? This is sick. That is why I have been speaking out.

Roman Abramovich

Sibneft Oil Co., Russia

Nowadays, I try to distance myself from Russia, but almost all of my wealth comes from Russia. Recently, I've seen a lot of articles asking whether global warming will be "good for Russia." This is a dumb question. Like anything, it will be good for some people and bad for some people. But I am doing everything I can to make sure that I am one of the people who benefits from global warming.
It's simple: As temperatures rise every year, ice will melt and huge new areas will be open for oil and gas exploration in the Arctic. And as one of Russia's wealthiest men, and head of a large oil and gas company, this is the chance of a lifetime. Researchers tell us that one quarter of the Earth's untapped fossil fuels, including 375 billion barrels of oil, lie beneath the Arctic. In the industry, we're talking about this opportunity as the new "black gold rush." Already our competitors in Norway—Statoil—are working on project Snow White, which will generate an estimated $70 billion in liquefied natural gas over the next 30 years. I'm not going to sit back and let the Norwegians or anyone else beat me out of this new business opportunity.
I'm sure that global warming is bad for a lot of people, but I'll leave that to the politicians and scientists. I'm a good businessman—a good oil businessman—so it's time to get to work.

World Conference on the Impacts of Climate Change

Oszkár Világi

Master of Energy & Lord of Rye Island

I was born in Dunajská Streda. I am a lawyer, business owner, manager, post-November politician and participant in the Velvet Revolution. In November 1989 I was a co-founder of the Hungarian Independent Initiative party. I work in the energy, agriculture and food industries. I have been CEO of Slovnaft since 2006 and own the DAC and Győri ETO football clubs. And I also founded Kukkónia – a successful brand of "local" products. Bread and games. I know exactly what people need. I am close to politicians not only in Slovakia and I can use them for my own interests.

I say we cannot avoid the global energy crisis. Over the last 50 years, the world population has doubled from 3.03 to 7.84 billion. And we live longer lives. We use three times more energy than half a century ago. The question is where this energy comes from. I know climate change will change many people's lives. But we need energy. And these problems should be solved by politicians in world forums. I work on developing the region in which I live and in which I own a large area of land, businesses, and services, not to mention politicians or municipalities.

All I am saying about this is that 82 percent of energy still comes from fossil sources and Russian oil is the cheapest. I would like to reject claims that Slovnaft has "cheated" someone into something The current wording of the embargo means that after 18 months we will no longer be able to export anything from Slovakia. However, Slovnaft's capacity is three times larger than that of the Slovak market. So we have to import non-Russian oil through the Adriatic pipeline. By mixing other oil with Russian oil, we can export at least some of our products. Because, our employees are also important. And so that they don't lose their jobs, we must produce. We must sell.

Anisur Rahman

Mayor of Antarpara, Bangladesh

I am the mayor of Antarpara, a village in Bangladesh. Antarpara is on the Brahmaputra River that flows from the Himalaya Mountains in India. We are in the lowlands, and our village floods every year. We are used to it, and, in fact, the flooding is good because it leaves our land more fertile. But now the floods are much worse. Now the floods are huge and each year they destroy our homes and carry off the land underneath them. My village used to have 239 families. Now we are 38 families. But where can we go when our homes are gone? Our country has 150 million people—the most densely populated in the world. I have an 18-month-old child. By the time she is grown, this village won't be here. Where are we supposed to go? Do we all get tickets to America?

Rinchen Wangchuk

Snow Leopard Conservancy, Ladakh, India

When I was a boy, after school ended for the summer, I remember slipping down the glacier that stretched far down the mountains near my village in the Nubra Valley—in Ladakh, the far northern part of India. Today, that glacier is almost gone. And I am watching the glaciers of the Karakoram Mountains disappear a little more every year. One study found that each year, the glaciers lost between 49 and 66 meters, and another found that since the 1960s, more than 20 percent of the glaciers have disappeared. And as global warming increases, the glaciers will begin to melt faster and faster.

Glaciers are ice that has built up over thousands of years. Because it rains only two centimetres a year in Ladakh, we depend on the glaciers for 90 percent of our water. Farmers depend on this water to irrigate fields, and everyone depends on it for drinking. Ladakhis in the villages have worked out a cooperative system to share the water, but what will happen if the glaciers disappear? How will we survive?

In the rural areas of Ladakh, we have almost no cars. We pollute very little and release almost no greenhouse gases. It is unfair that the rich countries that produce so much carbon dioxide should be destroying the glaciers we depend on.

Moi Enomenga

Huaorani Indian, Eastern Ecuador

For years, the oil companies have invaded my people's lands and the lands of neighbouring peoples—the Shuar, the Cofan, the Sequoya—in the rainforests of eastern Ecuador. First was Texaco. They left thousands of open pits that poisoned our rivers. Oil companies have spilled millions of gallons of crude oil and they continue to dump toxic chemicals into our rivers and streams. And oil development has also led to deforestation. When the oil companies build the roads, other "settlers" move in and chop down our forests and scare away our game.

With oil comes destruction. And now we learn that not only our rainforests is oil development destroying, it is destroying the world, through carbon dioxide pollution that leads to global warming. Oil kills the Huaorani through pollution and kills everyone through global warming. We say, "Leave the oil in the ground." Why do rich countries come here?

People from the richest and most populated countries come to the poorest to take our resources, to live their life better, and leave us even poorer. But we are richer than they because we have the resources and the forest, and our calm life is better than their life in the city. We must all be concerned because this is the heart of the world and here we can breathe. So we, as Huaorani, ask those city people: Why do you want oil? We don't want oil. We want a clean land.

World Conference on the Impacts of Climate Change

Pavel Tykač

Czech republic

I graduated from the Czech Technical University. At first, I traded in computer technology and I invested in buying shares of Česká sporiteľna. Later I focused on the energy sector.
At the beginning of the century, I bought the company Mostecká uhoľná, which I transformed into today's international group Sev.en Energy – a company with an annual income of more than 750 million Euros, which is almost 19 billion Czech crowns. Sev.en Energy is based in Cyprus, so I don't have to pay that much taxes. I only pay 3% of the mining to the state, which officially owns the coal.
The Sev.en group owns two surface brown coal mines in northern Bohemia. We have been operating Chvaletice – our own brown coal power plant since 2013. At the beginning of 2021, I also bought the Počerady power plant – the largest Czech producer of greenhouse gas emissions. I do business with coal not only in the Czech Republic. As of last year, together with two Chinese companies, we also own five coal and gas power plants in Australia and Great Britain and, most recently, two coal companies in the USA.
I am a great businessman. I am one of the ten richest Czechs.

Mustafa Abdul Hamid

From Azaz, Syria — now living in Kara Tepe Refugee Camp, Lesbos, Greece

My life in Syria used to be good. It all changed beginning with the winter of 2006. That was when the drought began—a drought that continued through 2010. It was the worst drought in Syria's history. Before the drought, my family and I farmed three hectares (almost seven and a half acres) of beautiful, rich top soil. We grew wheat, fava beans, tomatoes, and potatoes. Before the drought we harvested almost a ton of wheat per hectare. But then there was no more rain. All I needed was water, and I didn't have water. So things got very bad. The government wouldn't allow us to drill for water. You'd go to prison. The drought lasted for years, and no one said anything against the government. Then, in 2011, we'd had enough. We decided to make a revolution. It was water and land that began this revolution. But the government started killing us. The violence was terrible. I could no longer make a living for my family. There was no work. So I decided to flee Syria. Now I live in the Kara Tepe refugee camp, the main camp for Syrians on the Greek island of Lesbos, near Turkey.
Some people say that we are refugees from the war. Some people say that we are climate refugees, because climate change is creating drought everywhere. But for me, the war and the drought, they are the same thing. Climate change means war.

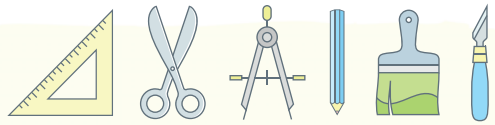
Balázs Tóth

farmer, Zlatná na ostrove, Slovakia

I think people are starting to realize that replacing plastic bags with cloth bags, sorting trash honestly, turning off hallway lights, or buying food from local farmers won't reverse the climate crisis. I think people suspect this problem is much bigger and that they alone are not enough to solve it. They know it is necessary for the power players to do something about it. The last years brought a lot of changes. People already perceive climate change as a really big problem. They see the forest behind their house. They see their neighbour's well that is almost out of water. It's just that people have not yet taken steps to enforce the Constitution right to a quality environment for all of us.

I see it all around me. My wife and I are trying to start growing vegetables organically. We do it on a small scale so far, but we have plans to expand. It's a bit like a suicide mission when I see how the climate is changing. Last few years were dry as crazy. Once we have already adapted to this in recent years and implemented various methods of how to grow in drought and heat, and how to use precious water sparingly, then there comes a terribly rainy year and everything is upside down. Tomatoes mould before they can even ripen. But it is great for salads. But who can tell in advance?! The worst part is probably the unpredictability. You can't just count on the weather to be getting only warmer and drier.

In addition to cleaning your own nest and starting to behave ecologically, it is also necessary to put our politicians under pressure. Because they do not care. They are not interested in the well-being of citizens, let alone the citizens who will live here after us. Their interests lie elsewhere. And that's bad. It is necessary for people to stand up against this and start becoming ecologically active.
Ecological activism is a part of my life. It is a fight against the injustice done to nature, usually for rich men's benefit. So the rich can become even richer. If this continues, the nature, planet and humanity will go from bad to worse. After all, we only want the best for our children, right? We buy them nice things. We try to make them happy. We dress them well. And that's why we should also try to provide a nice environment for them to live in, right?



World Conference on the Impacts of Climate Change

Steve Tritch

President and CEO, Westinghouse Electric

Before I became the head of Westinghouse I was senior vice president for Nuclear Fuel, providing nuclear fuel products and services to nuclear power plants throughout the world. And before that, in 1991, I became manager of the Nuclear Safety Department, and later was appointed general manager of Westinghouse's Engineering Technology. Today, I belong to the American Nuclear Society and serve on the Nuclear Energy Institute's board of directors. I guess you could call me Mr. Nuke.

You might say that I'm a man on the hot seat these days. Not only are we running out of easy-to-find oil, but oil is also blamed for global warming. Coal is an abundant source of power, but it produces even larger amounts of greenhouse gases than oil—or natural gas. People are looking to my company, Westinghouse, for solutions. The solution is obvious: nuclear power. As I tell my employees, "What's good for the planet is good for Westinghouse."

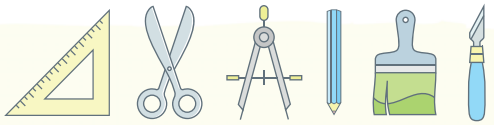
Sure, the accident at the Fukushima nuclear plants in Japan was serious, and people were hurt. But the whole industry has learned from this accident, and even Japan still knows that nuclear power is the best way to go. The real threat is global warming. Global warming could destroy much of life on Earth. But nuclear power produces no greenhouse gases. They say nuclear power has dangers. Well, last year 5,200 Chinese coal miners died in accidents—and that's a lot more than have ever been hurt in a nuclear power accident. I see hope for the planet and Westinghouse is here to play our part.

Paulette Richards

Miami, Florida, USA

I live in Liberty City, a mostly low-income and African American neighbourhood in Miami, Florida. I love this neighbourhood. Just walk down the street and you can smell that wonderful Haitian fried pork and plantains coming out of people's houses. I bought my home back in 2001 for USD 90,000. Recently, I've struggled to make mortgage payments because without health insurance my cancer treatments left me with a lot of debt. Somehow, the real estate people must have heard that I was short of money, because I have been getting phone calls every day from people wanting to buy my home.

It's the rising seas, caused by climate change. That's why the rich white folks want my house. For years, those people wanted to live down near the water. They still do, but now they are starting to see that with climate change, it's risky to live near the ocean. The city of Miami says that by 2060, the sea level will rise anywhere from 14 to 34 centimetres. For years and years, because of segregation and racism, banks wouldn't lend to people of colour, and we were only allowed to live in the less desirable high ground — the coral ridge, stretching from north Miami-Dade County to the upper Florida Keys. That's why suddenly, all the real estate people and developers are trying to buy our places and sell them for lots more money. Community activists in my neighbourhood call it "climate gentrification" (note: a set of local socio-cultural changes resulting from wealthier people buying real estate for housing in hitherto less prosperous communities). And as housing prices go up, so do the taxes. People who rent homes or businesses are seeing their rents skyrocket. What are they supposed to do? But I didn't buy a house for investment. I bought this to live in, to die in. It's my legacy, my home, my worth. I have nothing else. The good news is that this community is organizing and fighting back — people are talking about rent control and freezing taxes, and forcing developers to build affordable housing, if they want to do business here. This is my community; I'm not going anywhere.



World Conference on the Impacts of Climate Change

Natália Zikmundová

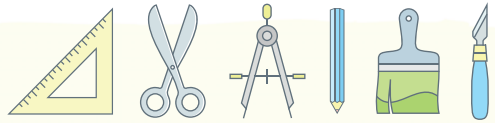
Student Council of Banská Bystrica, Slovakia

Let's change the system, not the climate. My generation is a generation living in fear.
Sitting in a café with friends, we talk about what our future will probably look like. But instead of sharing joyful ideas, visions and dream jobs, we share our fears. Fear that there is no future for us. Fear of drought and hunger, of floods and fires. Fear that our generation has been forgotten. The scenarios for the possible development of the climate crisis are quite catastrophic and do not leave us much or any time.
The climate crisis should be the number one topic, but most of the time it doesn't even make it into the footnotes. Instead of nature, we live in a world of money. Instead of cooperation, we compete for the highest profit. And the frustrated voices of students and scientists are not being taken seriously. Or as they say: "This country is not for young people."
I am often asked why I am concerned with environmental problems at the age of 18. I think it's actually natural. We all come from the nature and at the same time we are a part of it. The nature is our home. And yet it is natural that you want to protect your home. The destruction of the environment is a central issue of the future. And that is my future. I will not trade joy and freedom with my friends for coal, hopelessness and injustice. It may sound like my motivation comes from simple frustration and fear. That's not true. My motivation comes from the conviction that a better world is possible and it's worth fighting for. I believe more in the power and justice of organized people than in the endless pursuit of profit. But without honest climate policy, we will not be able to stop most of the causes of global warming. I hope policymakers confront climate injustice and implement radical systemic solutions. Without new solutions, the increase in the global average temperature of 1.5 degrees Celsius cannot be prevented. I believe that our protests will also contribute to this change.

Moi Enomenga

Huaorani Indian, Eastern Ecuador

For years, the oil companies have invaded my people's lands and the lands of neighbouring peoples—the Shuar, the Cofan, the Sequoya—in the rainforests of eastern Ecuador. First was Texaco. They left thousands of open pits that poisoned our rivers. Oil companies have spilled millions of gallons of crude oil and they continue to dump toxic chemicals into our rivers and streams. And oil development has also led to deforestation. When the oil companies build the roads, other "settlers" move in and chop down our forests and scare away our game.
With oil comes destruction. And now we learn that not only our rainforests is oil development destroying, it is destroying the world, through carbon dioxide pollution that leads to global warming. Oil kills the Huaorani through pollution and kills everyone through global warming. We say, "Leave the oil in the ground." Why do rich countries come here?
People from the richest and most populated countries come to the poorest to take our resources, to live their life better, and leave us even poorer. But we are richer than they because we have the resources and the forest, and our calm life is better than their life in the city. We must all be concerned because this is the heart of the world and here we can breathe. So we, as Huaorani, ask those city people: Why do you want oil? We don't want oil. We want a clean land.



World Conference on the Impacts of Climate Change

James Hansen

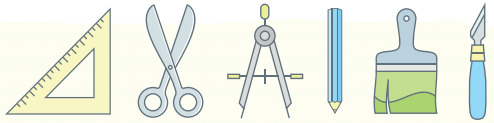
Former director, Goddard Institute for Space Studies, National Aeronautics and Space Administration (NASA), New York City, USA

I am a scientist, but I am also a grandfather. So that makes me especially interested in the future.
Recently, I was arrested at the White House in Washington, D.C., protesting the construction of the 1,700- mile Keystone XL Pipeline to send oil from the Tar Sands of Alberta, Canada, to Texas.
Why would a scientist and a grandfather commit civil disobedience and get arrested? That's simple. If this pipeline is built and they continue to take this especially dirty and polluting oil from the Canadian Tar Sands, it makes it very unlikely that we will be able to stabilize the climate and avoid the disastrous effects that we are already beginning to see. As I've said, this pipeline is the fuse to the biggest carbon bomb on the planet.
Many years ago, I was one of the first scientists to warn that as we burn more fossil fuels—coal, oil, natural gas—the carbon dioxide created will heat the Earth to dangerous levels, with terrible, terrible consequences. I thought people would respond to scientists' rational arguments that we needed to end our addiction to fossil fuels. Now I know we need to take more drastic action.
So I volunteered to be arrested with 1,200 other people to draw attention to the importance of stopping this deadly pipeline from being built. I am more than 70 years old, but if needed, I will keep getting arrested.

Tomáš Kušík

Chairman of BROZ – He returns water back to the branches of the Danube River, Slovakia

I am the chairman of the Regional Association for Nature Conservation and Sustainable Development in Bratislava (BROZ). We are a team of professional conservationists committed to the practical protection and restoration of forests, meadows and wetlands in Natura 2000 areas. Our organization has existed for 23 years. Although we have achieved a lot, the landscape certainly does not look the same as it did a hundred years ago and there is still much to do. However, we managed to divert some branches of the Danube, protect several valuable forests from deforestation and preserve life in some areas.
I really like the alluvial forests around the Danube, especially in Petržalka and Rusovce. These are the places where I grew up. I'm glad we managed to save them from deforestation. Twenty years ago, foresters were of the opinion that these were overgrown trees that needed to be destroyed. Today we have beautiful nature reserves there instead. The area around the Danube is a very interesting and valuable environment and originally very diverse. There used to be a truly mixed composition of alluvial forests, bodies of water, wetlands, various islands and swamps. A diverse range of plants and animals lived in this diverse environment.
Our nature conservation activities can be seen not only in the Danube area but throughout all of Slovakia. People are coming to help us. We are now raising money to save the 40-hectare Čiližská wetland. In order to buy it and carry out conservation measures, we need to raise 100,000 Euro. We have already managed to collect half of the amount.



World Conference on the Impacts of Climate Change

Elon Musk

Entrepreneur and investor

Climate change is the biggest threat that humanity faces this century. That's why I co-founded Tesla – a company that makes not only electric vehicles but also solar panels and batteries to store renewable electricity that needs to replace all fossil fuels. Thanks to the great interest in electromobility, Tesla has become the largest car company in the world in terms of market value. Currently, its market value is almost $550 billion and I am the third richest man in the world. I invest my money in SpaceX, which operates in the aerospace industry. My main goal is to reduce the cost of space travel. When something terrible happens on Earth, whether by humans or nature, we want life insurance for life itself.

My vision is to use my Starship fleet to create living conditions for a million people on Mars within 40 to 100 years. Thanks to terraforming, i.e. converting the entire planet to Earth-like conditions, I would like to create an atmosphere in which it is possible to function without a spacesuit, ideally without an aid breathing apparatus. I hope to conduct the first unmanned cargo flight to the planet within this decade.

It's not for the faint of heart. And neither for the poor, of course. Honestly, a lot of people will probably die in the beginning. But it will be a wonderful adventure and an amazing experience.

Richard H. Anderson

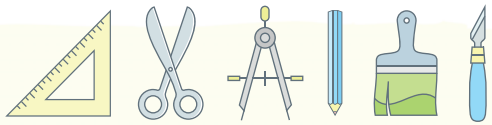
CEO, Delta Airlines, Atlanta, USA

I am CEO of Delta Airlines, and live in Atlanta. I'm a businessman and a lawyer, and have been in the airline business for more than 20 years. My job is to oversee Delta's long-term goals. Ultimately, I need to keep the company profitable for our investors and a secure and fulfilling place to work for our 80,000 employees.

I've been reading that air travel is bad for global warming. People say our jets produce a huge amount of carbon dioxide and other greenhouse gases that increase global warming. An article I read recently said, "Flying is one of the most destructive things we can do." That's true. This researcher concluded that "the only ethical option is greatly to reduce the number of flights we take."

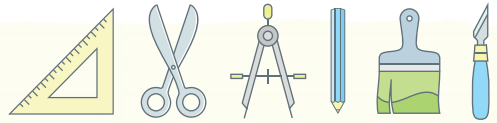
But ethics are complicated: Don't I have an ethical responsibility to my employees and stockholders – and to the 160 million customers who fly Delta every year, on more than 15,000 flights each day? And that means expanding air travel, advertising low fares, and trying to get people to take vacations to faraway places like Japan and China, to keep Delta profitable. Sure, we will try to pollute less, but we'll leave global warming to the politicians and scientists to figure out. I'm a businessman.

Activity source: OZ Na Zemi



Role-play Chart

Find someone harmed by climate change.	Find someone who could benefit from or contribute significantly to climate change.	Find someone who has been or will be forced to move due to climate change.
Find someone who is affected by climate change just like you. How is your situation similar?	Find someone who has an idea to solve climate change. What‘s their idea?	Find someone with whom you can take action against climate change.



Consequences and Solutions

Complete the following tasks in connection with the role play.

1. Write down all the consequences of climate change that you noticed during the role play:

2. Sort these consequences into the specified categories and supplement them with your own suggested solutions:

Consequences for:	Solutions
Biodiversity	
Water	
Soil	
Atmosphere	
People	

3. Write down 5 things that you can change in your life to be more climate friendly or also become a climate hero:

1.

2.

3.

4.

5.

Shards of the Future

OBJECTIVES:

- Knowledge of climate change mitigation measures and what communities can do to prepare for them better.
- Discover and discuss the deep social causes of the climate crisis.
- Compare different views on mitigation and adaptation measures.
- Formulate your opinion on solving the problem of climate change.

High school

THINK & FEEL

(Evocation)

Ask the students if they have ever come across any future theory predicting how the world will change in their lifetime (i.e. by about 2070). Let them briefly share what they think of such visions or how realistic they see them to become actually true.

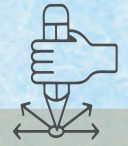
Show the students the **Futuropolis** poster you can find in Handouts. Ask them these questions: What is the main topic of the poster? Do you see a connection between the image and our reality? What part of the picture do you see yourself in now and what part do you see yourself in the future? Do you know any influencers or celebrities who share their opinion about our future?

KNOW & EXPLORE

(Awareness)

Divide the students into groups. Have everyone complete the **Three Columns** worksheet. Your task is to classify expressions and words into three categories (causes, consequences, and solutions to climate change). Each group then presents their conclusions. Evaluate the results.

Have a discussion with the students about what solutions we can use to mitigate climate change. Have everyone choose a solution from their worksheet or suggest a solution that´s not there. As homework, they will develop a project (focusing on the advantages and disadvantages of this solution) and will present it to the class. You can also hold a school-wide event called “Market of the Future!”, where students from all classes present their suggestions and solutions to each other.

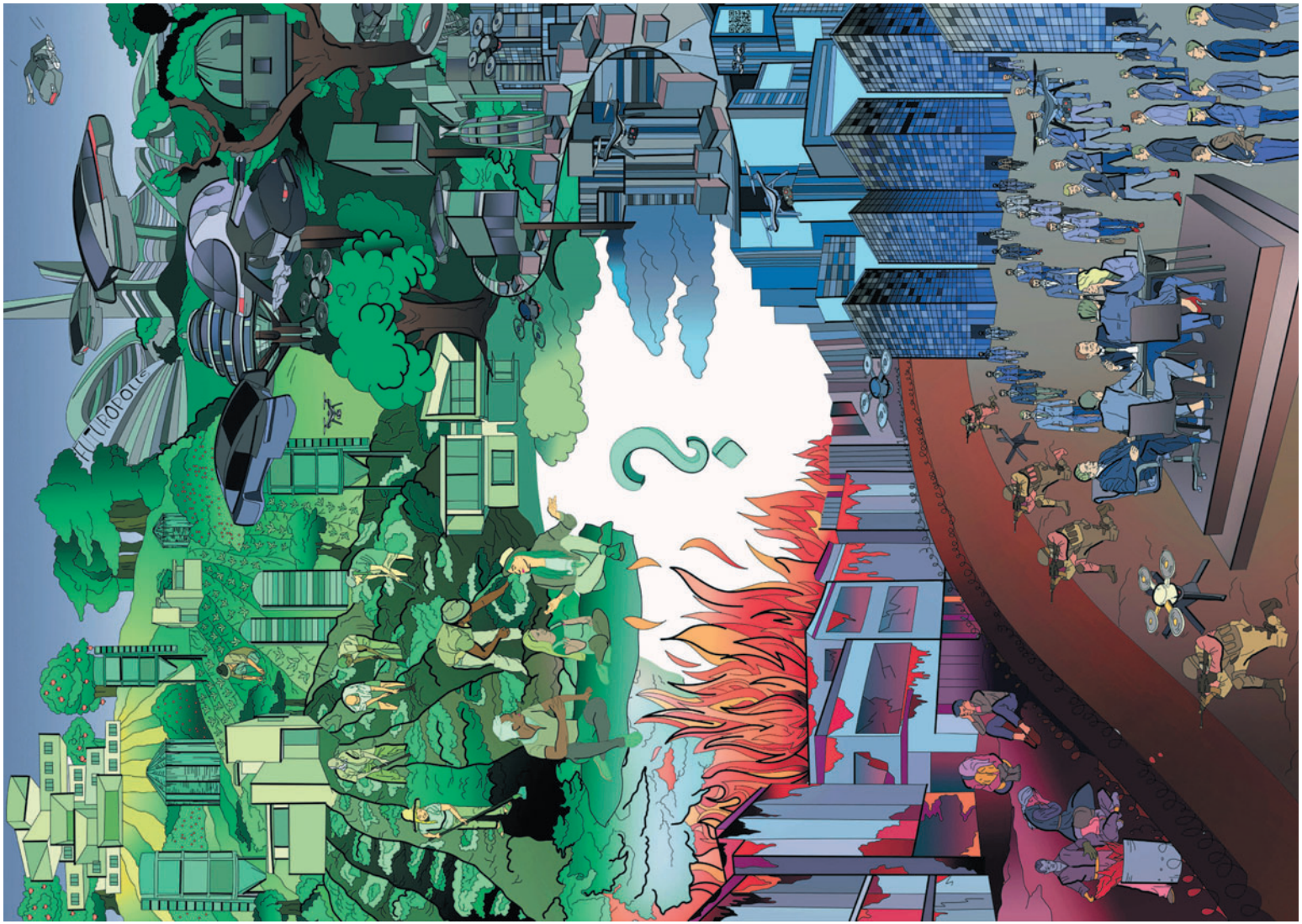


ACT & CHANGE

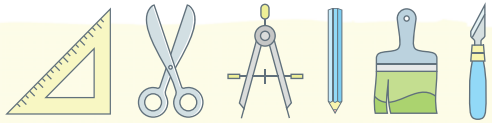
(Reflection)

After listening to all the presentations, divide students into groups. Give everyone the **TOP Solutions List** worksheet. The task is to evaluate the listed solutions based on the specified criteria and to adjust them at 1st, 2nd and 3rd place. Which solutions came with the best results? Discuss their decisions and their personal suggestions for solving this problem.

Futuropolis



Source: https://futuropolis.cz/wp-content/uploads/2022/09/KLIMA-1.jpg



Three Columns

Sort the words and phrases below the table into three categories (columns) depending on whether they relate to causes, consequences, or solutions to slowing or mitigating climate change:

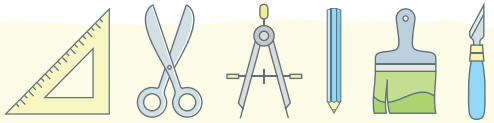
Reasons	Consequences	Solutions

Citizen activism
Deforestation
Increasing livestock farming
Use of fluorinated gases
Transport (mainly air)
Low carbon strategy
Voluntary modesty
Carbon sequestration
International conventions and obligations
Global warming
Fossil infrastructure blockages

Loss of biodiversity
Human migrations
Rising sea and ocean levels
Spread of diseases
Unemployment
Floods
Drought
Desertification
Soil erosion
Lack of water
Species extinction

CSA – Community supported agriculture
Transition Towns
National currency
Social entrepreneurship
Natural farming
Replacing fossil fuels with biofuels
Shared Economy
Renewable energy sources
Energy cooperatives
Use of fertilizers containing nitrogen
No growth economics

Burning coal, oil and natural gas
Shorter working hours
Melting of the glaciers
Maximum salary
Environmentally friendly buildings
BAT technologies
Electromobility



TOP Solutions List

Discuss individual solutions to mitigate climate change with a group of classmates. Within each criterion, the solution is ranked from 1st to 3rd place (where 1st place = the largest contribution and 3rd place = the smallest contribution with regard to the specified criterion).

	Criteria					
Solution	**Climate change mitigation**	**Contribution to society**	**Benefit to te local economy and community**	**Motivation to act**	**Personal development**	**New "green" jobs**
Community supported agriculture						
Transition Towns						
Local currency						
Socially beneficial business						
Agriculture close to nature						
Electromobility						
Replacing fossil fuels with biofuels						
Shared economy						
Renewable energy sources						
Blockade of fossil infrastructure						
Energy cooperatives						
Civic activism						
No growth economy						
Low carbon strategy						
Shorter working hours						
Voluntary modesty						
Carbon sequestration						
International conventions and obligations						
Maximum wage						
BAT technologies						
Environmentally friendly buildings						

Which solutions came with the best results?

NOVEMBER

FROM THE TATRAS TO THE DANUBE

From the Tatras to the Danube

You need to know

Climate change is a global phenomenon that affects the whole world, **including Slovakia.** The temperature on our planet is gradually increasing, which has a significant impact on the environment and human activity. The average annual temperature in Slovakia has increased by **1.1 degrees Celsius** over the last hundred years. From the Tatras to the Danube, climate change is primarily expressed in **periods of rain, drought and extreme climatic events** such as floods and strong storms. Atmospheric precipitation fell by an average of 5.6 %. The southern and northern parts of the territory exhibit regional differences. In the south of Slovakia, this decrease was 10 %, while in the north and north-east it was 5 %. These changes affect agriculture, forestry, water resources, etc. (Source: https://www.shmu.sk/)

From the Institute of Environmental Policy (IEP) Vedúci! Horia obce! (2023) analysing the degree of climate change threat at the community level, it emerges that the southern part of Slovakia (the districts of Nové Zámky, Komárno, Dunajská Streda and Bratislava) is most at risk of extreme heat. The report says it is "largely deforested due to agricultural activities, adding to the vulnerability". However, the consequences of the drought also threaten forests at higher altitudes and damage coniferous forests in the centre and north of Slovakia. The impact will be on the entire Slovak economy. Because of the drought, the harvest will be smaller and extreme weather events will also have a negative impact on the health of the population. (Source: IEP)

The consequences of climate change vary in frequency and intensity in different regions. A solution that aims to prevent further deterioration and minimize risks is an appropriate combination of so-called adaptation and mitigation measures.

Adaptation measures represent options for how natural and socioeconomic systems can adapt to ongoing or expected climate change. In cities and communities, these include, for example, the construction of rain gardens and green roofs, vertical gardens and green walls, use of lawn paving, and planting greenery.

Mitigation measures are currently being intensively implemented in Slovakia. They represent solutions that should lead to the containment of climate change. They aim to reduce emissions or increase the absorption of greenhouse gases. These include limiting the combustion of fossil fuels and increasing the proportion of renewable energy sources, sensible soil cultivation, avoiding waste, efficient use of energy on the production and consumption side, building energy-efficient buildings and promoting sustainable mobility. Great attention is paid to protecting nature – preventing deforestation, restoring meadows, wetlands and forests and creating new forest stands are necessary to preserve biodiversity and sequester carbon from the air.

Although trees mitigate the negative effects of climate change, logging in cities is often done recklessly and outside of the dormancy of vegetation. A pilot survey on Lower Rye Island, which examined the environmental sensitivity of the population, pointed out two facts. Firstly, only a handful of people between the ages of 45 and 60 plant trees. And secondly, people believe that technology will solve our problems. (Source: SEV Dropie)

The transition to a **low-carbon economy** is a great opportunity for Slovakia, a challenge for greater energy independence, the creation of new jobs and the development of science and research. The so-called Carbon farming will become an ecological business model – land managers will be rewarded for adopting land management practices that increase carbon sequestration from the atmosphere (e.g. planting hedges or trees, growing legumes, using catch crops and cover crops).

It should be emphasized that climate change is one of the most serious environmental challenges Slovakia faces. We are feeling the consequences today and will also affect our future and the future of our children. It's so easy to take action now. Each of us can contribute to reduce the carbon footprint of our lifestyle and support biodiversity.

More on this topic

- Slovak Hydrometeorological Institute – article: "Manifestations of climate change on a global scale and in Slovakia"
- Ministry of Environment – information on adaptation and mitigation, climate change law, Low-Carbon Development Strategy of the Slovak Republic, Slovak strategy of adaptation to climate change, etc.
- Vedúci! Horia obce? - determination of the extent of the threat of climate change at municipal level in Slovakia.

Let‘s go!

2030 Climate Target

Support solutions for natural adaptation to climate change (Building a climate-resilient Europe - New EU strategy for adapting to climate change).

What’s the hold-up?

Climate change has been with us for several years. There is no doubt that we need to adapt to it, reduce the negative effects on our health and use it to our advantage. There are many adaptation measures, but many people do not yet know what they can change about their environment. They think that these must be complex technological solutions. Or that they themselves do not have the necessary reach or influence over it. However, anyone can create a species-rich meadow or rain garden.

THE CHALLENGE

Be involved

Climate change is a global problem, but adapting to it is a local matter. Some adaptation measures require no investment of time, money, or maintenance. You can implement these quickly and independently in your immediate environment. Be interested in what is already being done in this direction and what you can do to contribute.

1. Find out what adaptation measures have been implemented in your city, village, workplace or school.

2. Share your findings on www.ewobox.sk.

3. Even a negative finding is a finding. In this case, write to us about which measure you would like to implement yourself.

Dažďová záhrada, Lilla Szabóová, SEV Dropie.

I'm a little Ladybugologist

OBJECTIVES:

- Form mindsets, values, attitudes and emotional connections to your local environment.
- Create knowledge about your surroundings.
- Sensitivity and respect for nature.

Kindergarten

THINK & FEEL

(Evocation)

Watch a short film about ladybugs Minuscule - The wing case / Sans élytres (Season 2)

Then talk to the children about what was real in the story and they could see in real world, and vice versa, what was possible only in the story. Have they ever seen ladybugs with their own eyes? Show them the developmental stages of a ladybug (*egg – larva – pupa – adult bug*).

KNOW & EXPLORE

(Awareness)

Print out the **Ladybug model** from the Handouts and prepare a stack of chestnuts to represent the dots on the ladybug's wings. Alternatively, you can make the dots together with the children, for example from Play-Doh. Sit in a circle. The children's task is to roll the dice and place the corresponding number of dots (chestnuts) on the model of the ladybug.

Find out if the children know how many spots a ladybug usually has on its "dress" and if they have noticed other ladybugs in the garden or on house walls. Show them cut-out pictures of different species of ladybugs and read about the adventurous Asian Lady Beetle on the **Ladybug** worksheet. Talk about why this adventurous lady came to us and why she is doing so well here.

Spread the legume mixture on the table (ideally a handful of several varieties). Match the individual legumes to the ladybug images according to their similarity (an example can be found in the **Handouts**). The largest legume will be Asian Lady Beetle, the so-called harlequin. First, the children sort out the harlequin, then all the other species (e.g. with the help of skewers). Become "Ladybugologists" and try to find ladybugs hidden on windows or in the corners of classrooms.

ACT & CHANGE

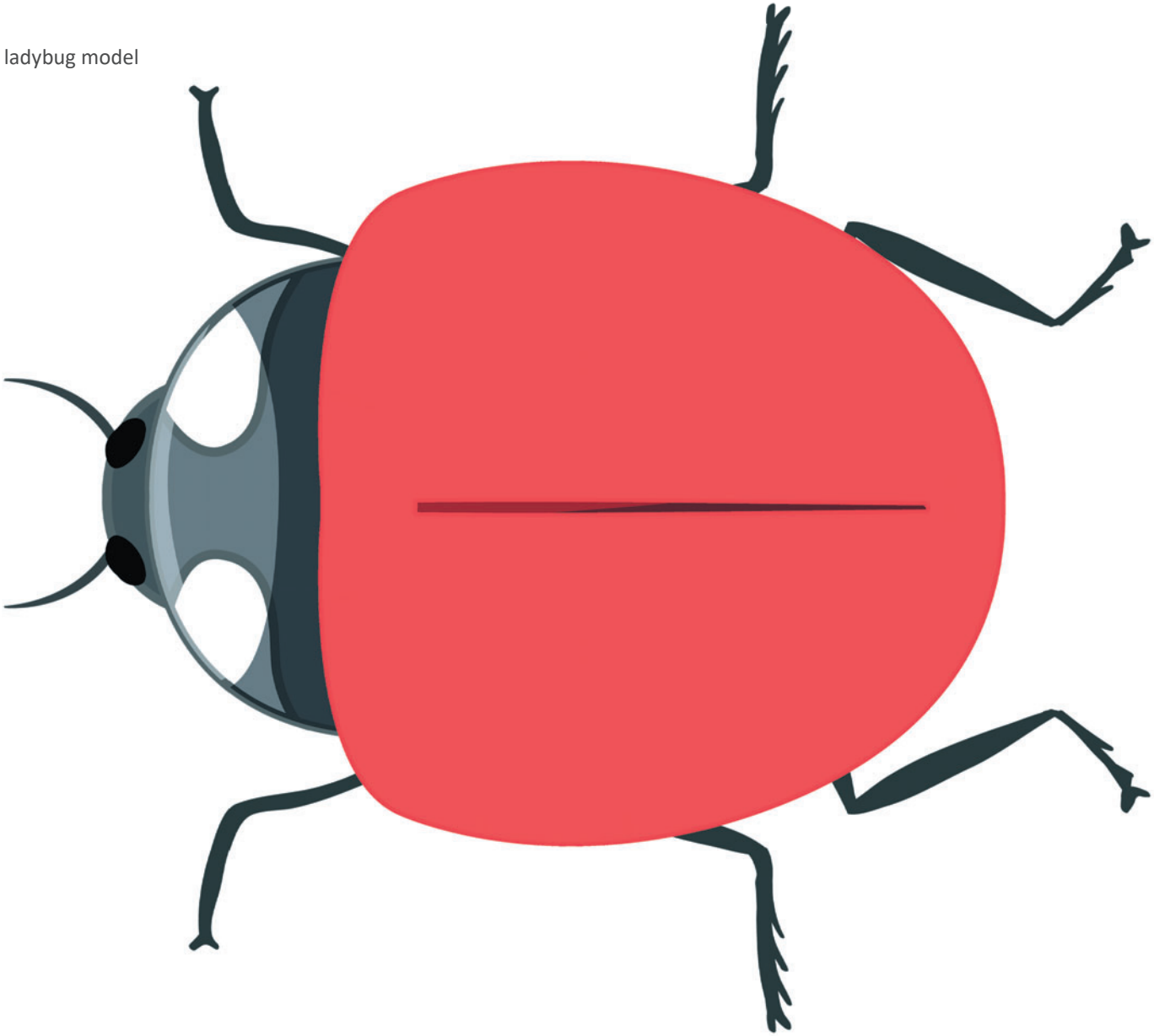
(Reflection)

Organize the construction of a large insect hotel. In autumn, a lot of "waste" is generated from the garden, such as dry grass, reeds, cones, wood and other materials that you can store in the insect hotel. You can fit a lot in there, so prepare a lot of material. Use 3-4 wooden pallets that you gradually fill with the collected material, layer by layer. Once you have filled all the floors, build the roof. For example, you can saw off a piece of a pallet and place some roofing scraps on it. Finally, attach the rabbit mesh with nails around the entire hotel so that the material does not fall off even in bad weather. You can later create a guest log describing all the guests living in your hotel. Don't forget the useful aphids – earwigs and ladybugs. From terracotta pots create houses for them, which children can colour.

Print out the **Who lives there?** worksheet and pin it to your wall. Throughout the year, observe your insect hotel and circle the species that have inhabited it (Honey bee, Wasp, Earwig, Ladybug, Chrysopa and Small tortoiseshell). If you spot another species, print its image from the Internet and paste it among the others. Learn interesting information about your hotel residents' lives.

Ladybug model

Place the dots on the ladybug model



Ladybug

Seven-spot ladybird
(Coccinella septempuncata)

Larch ladybug
(Aphidecta obliterata)

Five-spot ladybird
(Coccinella quinquepuncata)

Kidney-spot ladybird
(Chilocorus renipustulatus)

22-spot ladybird
(Psyllobora vigintiduopuncata)

Asian lady beetle
(Harmonia axyridis)

Cream spot ladybird
(Calvia quatuordecimguttata)

Source: Internet

Ladybugs

Asian Lady Beetle (Harmonia axyridis or harlequin) is non native, it is poisonous and kills our ladybugs. It breeds fast (13 times faster than our native ladybud). Be aware, it stinks and bites! If our native ladybug eats harlequin larva, it dies. If harlequin eats our native ladybug, it is food for it. Originally it was imported here to fight the noxious animals, but it went out of control. It is a pitty, because it eats aphides a lot.

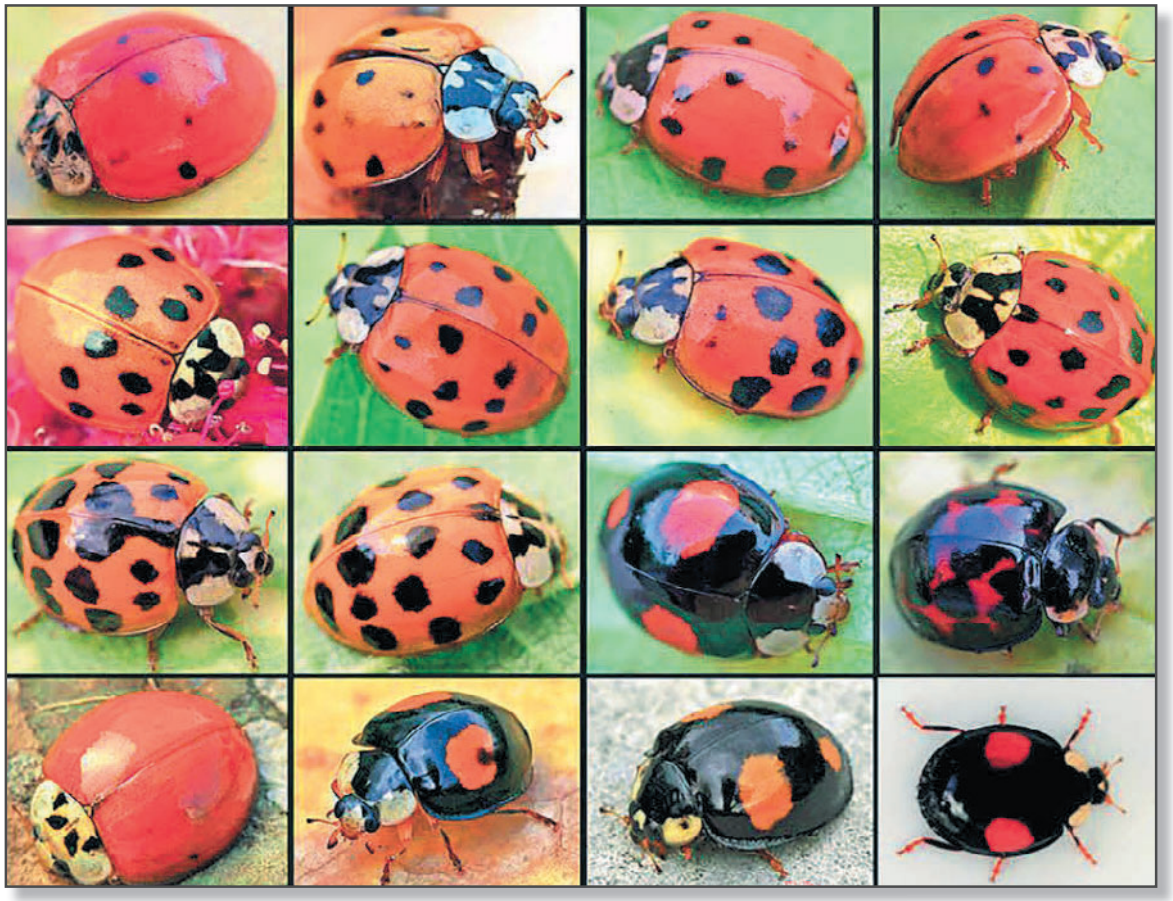


Image source: https://www.prezahradu.sk/otazky

Image source: Veronika Pogyánová, SEV Dropie

Who lives there?

Circle the inhabitants of your insect house and learn to recognize them. Enter the species missing in the picture and find out interesting facts about their lives.

Young Zoologists

OBJECTIVES:

- Understand ecological events and laws at the local level.
- Express your feelings about the damage to nature caused by climate change.
- Know how to behave for the good of the environment.

THINK & FEEL

(Evocation)

Play an animal game with your students. Name the animals that live in the world and in Slovakia. The students' task is to clap once for an animal that lives in Slovakia. For an animal living outside Slovakia, twice. Practice it first and then name the animals faster. Anyone who makes a mistake is out.

KNOW & EXPLORE

(Awareness)

Print out the **Landscape and its Inhabitants** worksheet from the Handouts. The landscape poster shows different ecosystems (*wetland, forest, meadow, lake*). Cut out the pictures of plants and animals and give each student one species. Their task is to colour the picture and invent a base for the animal or plant to stand on.

Sit in a circle with students and place the picture of the country in the centre. One by one, each student places their picture onto the landscape type (ecosystem) on the poster in which they believe the species lives. Talk about why each plant and animal lives there and what they need to survive.

Find out if students know what global warming and climate change are and spend some time talking about them. Show them step-by-step different scenarios that can occur in this context: 1. There was a severe drought and the wetland dried up, 2. The water in the lake warmed up and cyanobacteria multiplied, 3. A strong wind blew and broke the trees in the forest, 4. Torrential rains started and part of the meadow flooded. After each scenario, ask students what happens to the plants and animals and how they would feel in their place. They can move them to another part of the landscape. Talk about how climate change affects plants, animals, but also us humans. How do they feel about it?

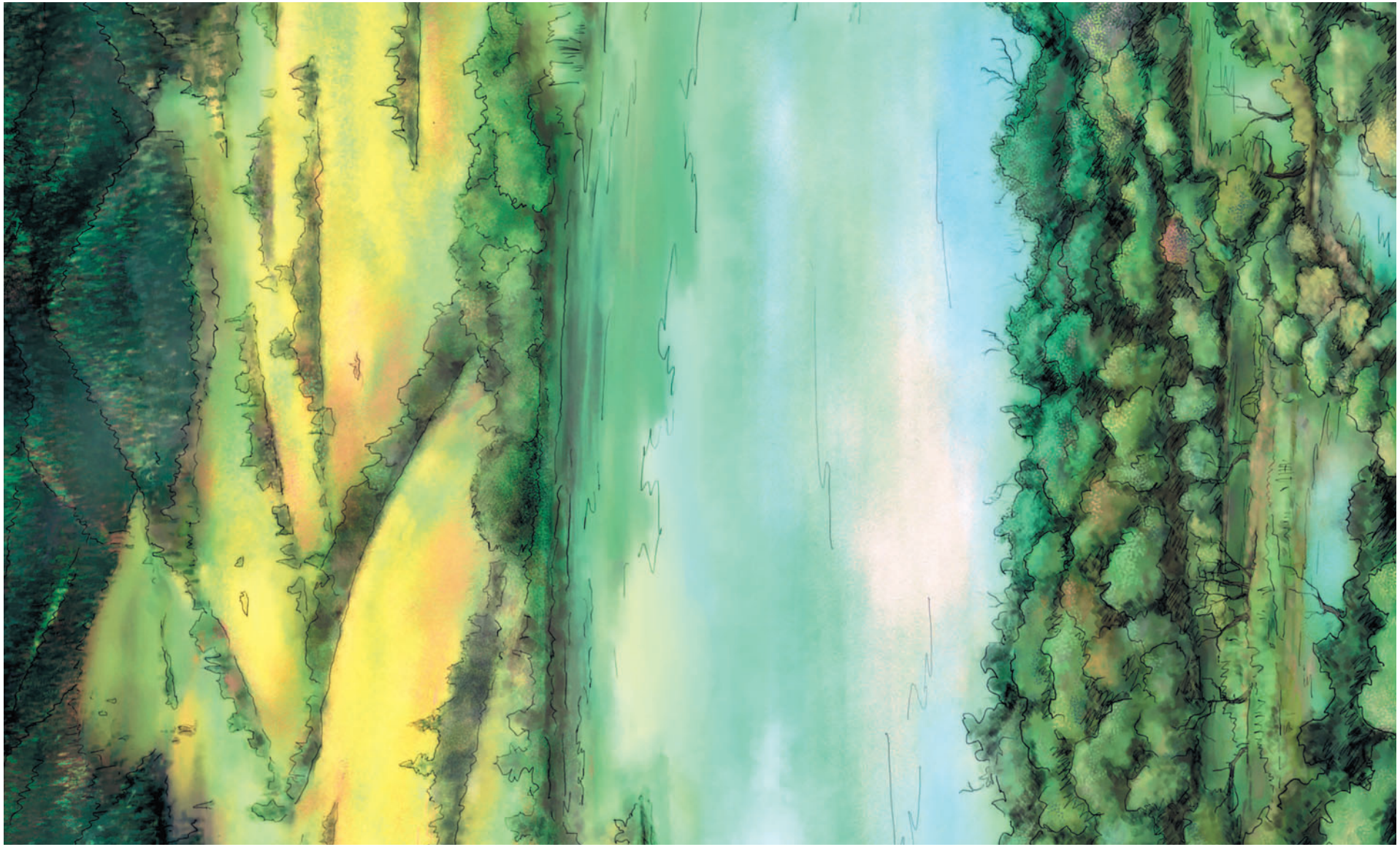
ACT & CHANGE

(Reflection)

Help the students think about how you can help plants and animals deal with the problems associated with climate change. Using interactive board, gradually show them the so-called Island of Life and discuss each moment: What is this island? How is it related to climate change? How can it help plants or animals?

You can also make selected "islands" by yourself. We will be happy if you present your creations on the environmental education portal www.ewobox.sk.

Landscape and its Inhabitants



Landscape and its Inhabitants

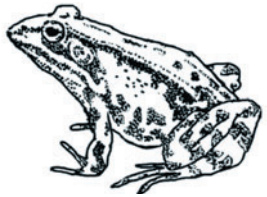

BLACK POPLAR


CORMORANT


BEAVER


TALL OATGRASS


COCKSFOOT GRASS

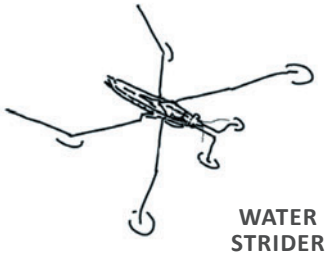

GREEN FROG


WOLF

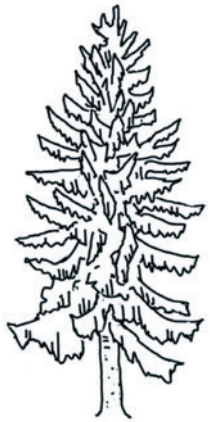

WHITE WILLOW


PENDULINE TIT


WHITE DAISY

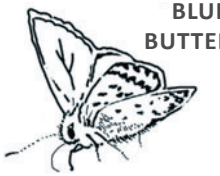

WATER STRIDER


RED CROSSBILL


NORWAY SPRUCE

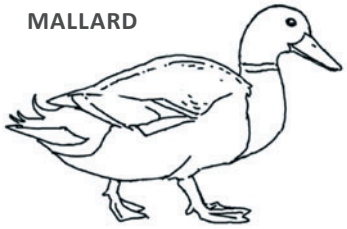

HORNED DUNG BEETLE


WHITE WATER LILY


BLUE BUTTERLY


BARRED WARBLER


BULRUSH


MALLARD


BLUEBERRY


LYNX

Images by: Ladislav Vojtuš

One day I'll be a meteorologist

OBJECTIVES:

- Describe the current impacts of climate change on ecosystems and human life at local level.
- Express your emotions related to the climate crisis and perceive the emotions of others.

Middle school

THINK & FEEL

(Evocation)

Show the students the infographic on the **Map of Changes** worksheet in Handouts. Which of these contexts and problems do you think also affect Slovakia? How?

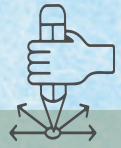
Play the Change Cube game. Cut out a cube of paper from the worksheet and glue it in place. Print out each picture, place it on the floor, blank side up, and sit around it. Each player's job is to roll the dice, turn over the picture (or two) and complete the task assigned to them. After each move, discuss the connections to climate change and the situation in Slovakia.

KNOW & EXPLORE

(Awareness)

Create your own weather station with the students. Prepare an outdoor thermometer and a rain gauge - a glass jar on which you can mark the scale in millimetres with a permanent marker. Place them in a safe place in the school yard.

Record the temperature and rainfall at the same time every day throughout the month. Write the information in the **MeteoChart** (you can find the pattern in the Handouts). Post it on the bulletin board and divide the writing tasks. At the end of the month, calculate the average temperature and rainfall. Search the Internet for average values for your region and compare them with your measurements. Additionally, try to find historical records of temperature and precipitation (ten or more years ago), compare them to the present, and discuss the results.



ACT & CHANGE

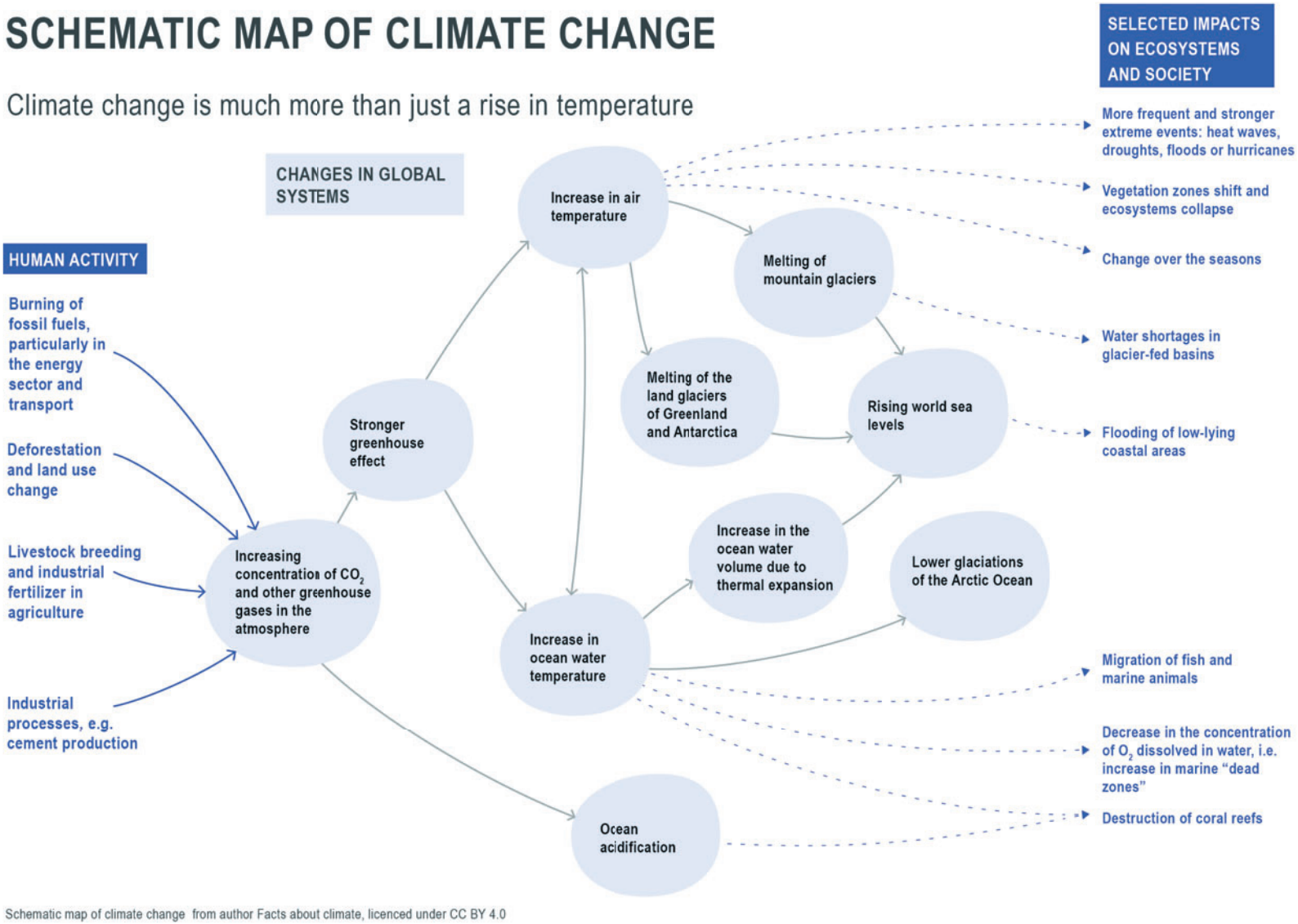
(Reflection)

The next student task is to find and use the camera to capture the effects of climate change in their own environment. For the selected photos, they will prepare an appropriate title and a text that describes their perception and the current situation – what is happening and how it has affected them personally. The students may also include specific suggestions for eliminating or mitigating negative effects.

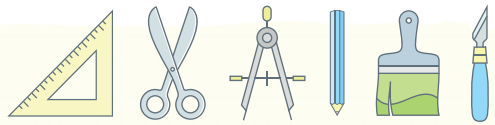
Organize a hands-on climate change photography exhibit with the students. Invite parents, the mayor of the town and its residents, as well as local civic associations to the opening.

You can also organize the exhibition monothematically, depending on the season or problems that concern and affect the students and the local community (weak snow cover for winter skiing, overheating of the school building, drying up of watercourses or wells, the spread of invasive species, floods, fires, poor harvest of certain fruits due to spring frosts or pests, etc.)

Map of Changes



Schematic map of climate change from author Facts about climate, licenced under CC BY 4.0



Change Cube

Cut out the cube and glue it in place. Play the game described in the One day I'll be a meteorologist activity.

DESCRIBE

Describe what you see in the picture. How does it make you feel?

APPLY

How and where can you use the information about the image, what can you do about the problem?

COMPARE

Compare the two images and find differences.

ASSOCIATE

What comes to your mind first? What does it remind you of?

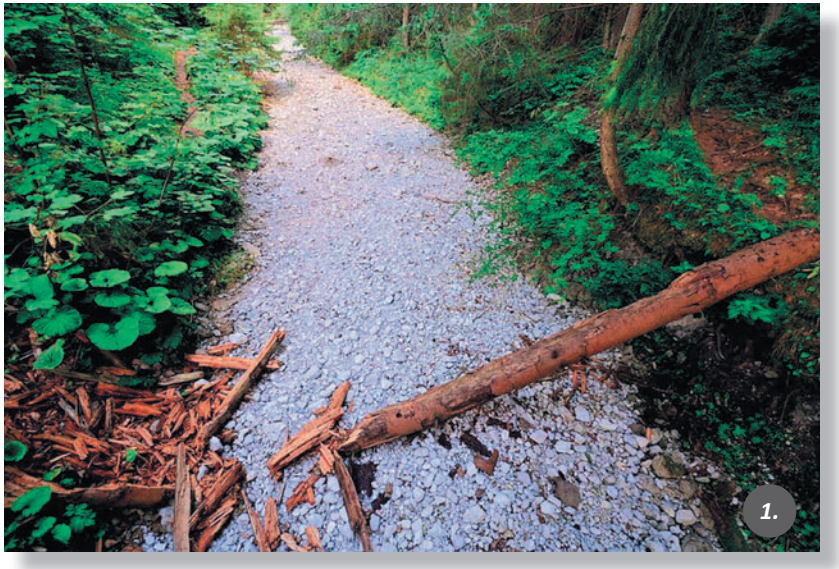
SUMMARISE

Take a stand on the picture, say the pros and cons, and argue your point.

ANALYSE

What problem do you see in the picture?

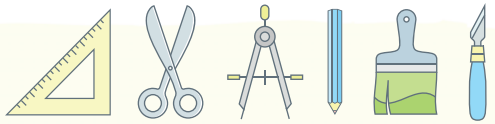
Handouts



Location names and image sources:
1 – Slovak Paradise
2 – floods in Ukraine
3 – Skalnaté pleso

Location names and image sources:
4 – drought in Australia
5 – Domaša
6 – Bodva

Location names and image sources:
7 – fires in Australia
8 – falling glacier in Argentina
9 – Rajčianka in Rajecká Lesná

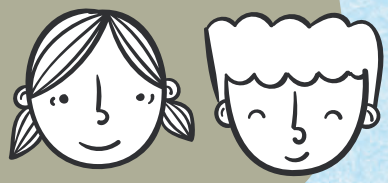


MeteoChart

Place a thermometer and rain gauge in the school yard. Record your measurements daily. At the end of the month, calculate the average temperature and rainfall. Try to find out what were the temperature and precipitation 10 years ago.

DATE	MEASURED TEMPERATURE IN °C	TOTAL PRECIPITATION IN MM	MARKED BY		
				CURRENT AVERAGE:	
				HISTORICAL RECORDS:	

With different eyes



OBJECTIVES:

- Know which measures serve to adapt to climate change in individual sectors and areas of human society.
- Compare and respect different perceptions, attitudes and opinions on climate change.
- Work on the school climate project.

THINK & FEEL

(Evocation)

Experience climate change through the eyes of the students themselves. Find the answers to these questions: 1. How does climate change make you feel? 2. How are you restricted by this? 3. What positives does it bring? 4. What does it mean for you personally? Write down the answers.

Then give the students the task of finding out what their parents and grandparents think about climate change. In a similar structure, they should talk to them about how they perceive and feel climate change in their lives over the years. For example, they can present their findings in the form of a novel, a science fiction story, a survey, a video, or another form that they find expressive.

After considering climate change from the perspective of an older generation, return to the students' perspective on the phenomenon and look for generational differences and similarities. The aim is to raise awareness that climate change is not just a blockbuster TV news story about glaciers falling into the sea and starving polar bears. Over the years it also affects our lives, families, work and relaxation, livelihoods, health... It affects us.

KNOW & EXPLORE

(Awareness)

Work in class with the document Strategy of Adaptation of the Slovak Republic to the Climate Change (2018 update), in printed or electronic form. Divide the students into pairs or groups and assign each a part of the document that deals with the consequences of climate change and adaptation measures for the selected area (subchapters 5.1. – 5.11.). Each group is tasked with processing and presenting the information from each chapter by assigning it to one of the following professions: TV editors – prepare a report for a TV guide; Radio editors – record a podcast; Editors in newspapers, magazines or on the Internet – write an article according to the focus of the medium; Spokesperson – write a press release; Creative people – create an advertisement.

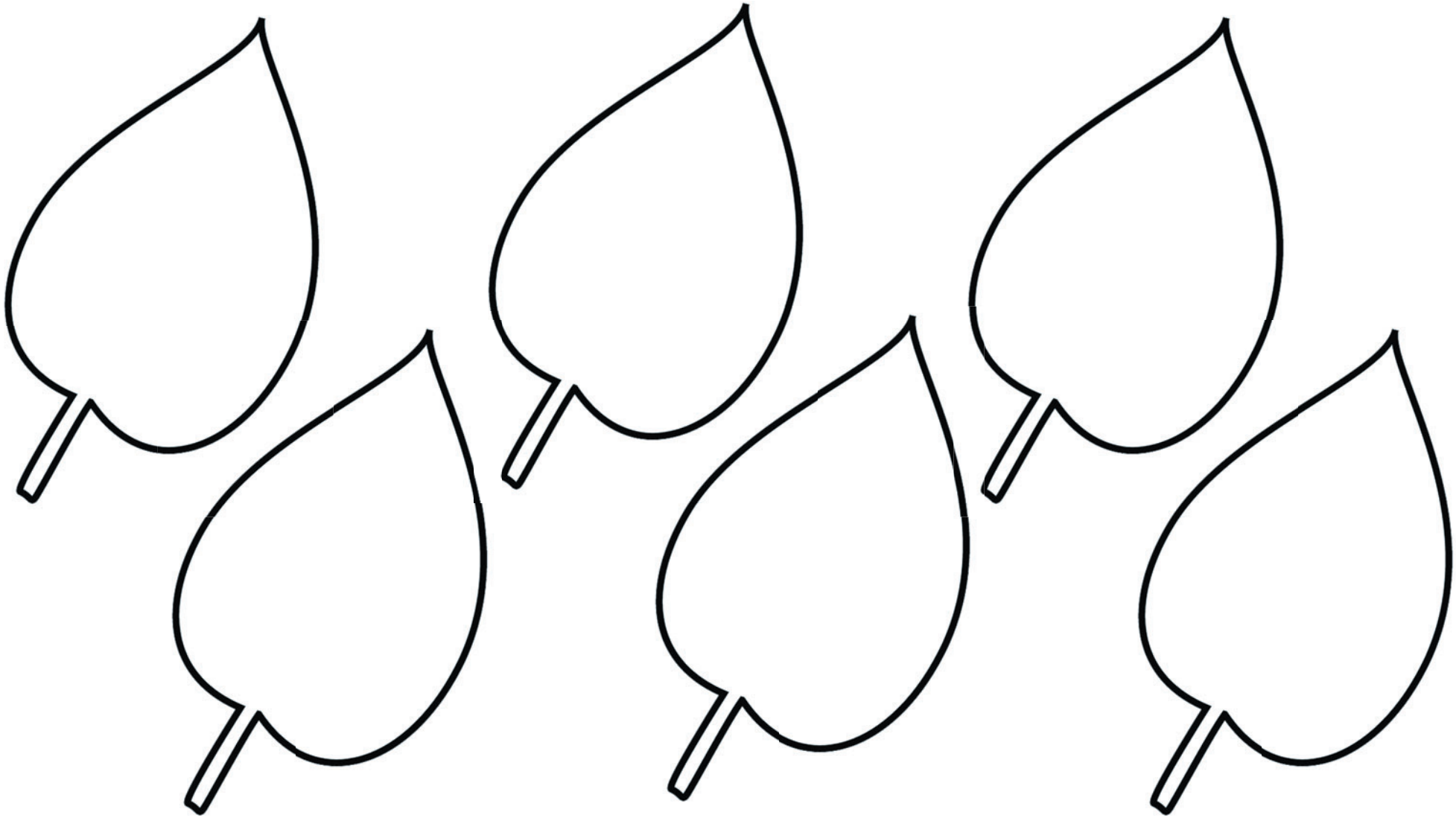
ACT & CHANGE

(Reflection)

Organize a school climate forum, where students present their work from the previous activity, then the student council, teacher representatives and school management discuss the consequences of climate change on the school and propose measures. Integrate a lecture from an external expert into the agenda. The forum can be moderated by the students themselves and its outcome should be the adoption of common conclusions and proposed actions (declaration, strategy) with which the school voluntarily commits itself to Slovakia's joint efforts to mitigate and adapt to climate change.

You can also collect feedback, suggestions for action or personal resolutions from participants in your climate forum in this way: prepare **Leaves-like letters** (in Handouts), string, pens, scissors and a "tree" (it can be a large branch cut from a tree in autumn, dry tree, cardboard tree, etc.) At the end of the forum, ask the participants to write their suggestions on a piece of paper and tie it to a tree branch. Place the tree in the school hallway to remind everyone of this important event.

Leaves-like letters



DECEMBER

MORNING WILL LIGHT ME UP

Morning will light me up

You need to know

It is morning and the first rays of sunshine are entering the room. I open the window and it shines on me... I will feel the energy that sets everything in motion. It warms the Earth's surface, generates wind, evaporates water, drives rivers, and gives life to plants and, through them also to us, human beings. Wind and water energy, biomass and also fossil fuels only exist thanks to it. I feel the flow of this energy through all living and non-living systems on Earth, in Slovakia, in the city, in my apartment, in my body.

What does your morning look like? Someone goes straight to the bathroom for their morning routine. Others make a beeline for the coffee machine or kettle. In the winter months, we turn on the light or heat up our homes. In the summer we might turn on the air conditioning. We're preparing something to eat. From early in the morning, we consume the energy necessary for the functioning of our organism, but also additional energy for our own well-being. **From early in the morning, we are affecting climate change and climate change is affecting us.**

Let's shed some light on energy at home. The majority of energy in Slovak households is used for heating (73%) and hot water production (12%). Lighting and appliances account for 10% and cooking for 4%. This data comes from a survey carried out by EUROSTAT in all European countries in 2020. From where does this energy come from? Children could simply say that it comes from the socket or the radiator. Us adults would answer: the supplier.

That's why we have to look deeper. We can find the information from which sources the electricity for our household comes on the bill, but it´s usually on the supplier's website. Electricity from coal and natural gas has the largest carbon footprint (400-800 g CO_2 per 1 kWh). Electricity generation from renewable sources is considered CO_2-neutral, which is not entirely true. But even if we take into account the emissions associated with the production, construction and recycling of the necessary equipment (from around 12 g for a wind turbine to 100 g of CO_2 per 1 kWh for a solar system), it is a significantly more ecological option than electricity from fossil fuels.

It is more difficult to see where the heat comes from in apartment buildings due to the central supply system. Our invoice and the Internet will help us here again. Heat from coal, heating oil and natural gas has the largest carbon footprint (180-350 g CO_2 per 1 kWh). On the contrary, very little comes from the nuclear core and biomass. As for biomass, there is a controversy about its neutrality from the life cycle of wood point of view (a young tree cannot absorb as much CO_2 as its predecessor).

Let's shed some light on ourselves. Our body is also an energy consumer. In order to be functional and able to work, it must absorb around 2.4 kWh of energy per day in the form of food. However, the average family of four in Slovakia consumes around 14,500 kWh per year (3,625 kWh per person per year, which is rounded 10 kWh per person per day, Source: SIEA). As a result, we use a lot of extra energy to support our needs and lifestyle.

Let's shed some light on the change. To mitigate the pace of climate change, Slovakia has committed to gradually reducing greenhouse gas emissions with the aim of achieving climate neutrality by 2050 (Low Carbon Development Strategy of the Slovak Republic). That means, it only emits as many emissions as it can absorb. Since the energy sector (together with industry and transport) is the sector with the most emissions in Slovakia, almost 30% of households' share of final energy consumption (Source: Envidat) is therefore not negligible. The extent to which our energy consumption contributes to or mitigates climate change is also in our hands and our decisions.

However, climate change bringing milder winters could be perceived as positive. Ultimately, we save on heating costs. On the other hand, it will bring prolonged periods of heat and drought, increasing the cost of cooling not only food but also indoor spaces to make life therein bearable. To turn blind eye does not pay out. The situation will neither resolve itself nor will it pass us by. The whole process started with us and it needs to be changed by us.

Let's shed some light on how. Fortunately, there is good news. As energy consumers, we have a number of mitigation measures available to us, i.e. solutions that lead to a reduction in greenhouse gas emissions. Some require a higher initial investment – building an energy-passive house, replacing an old boiler with a more efficient one, changing the source and system for heat generation and hot water production, various structural changes such as insulation, replacing windows, air or water recuperation Other measures may not cost you a lot of time or money – switching to a supplier of heat and electricity from renewable sources, buying green energy with a so-called guarantee of origin from your current supplier, reducing the indoor temperature by 2 ° C, regulating heat through valves, replacing old appliances, doing laundry at lower temperatures and much more.

Choose tailor-made solutions taking into account the amount of investment and its return, efficiency and your local conditions. On the website of the Slovak Energy and Innovation Agency, you will find many inspiring materials, recommendations and advice. Various funding programs such as Green for Households or House renovation are used to reimburse part of the investment.

Annually, the solar energy which falls on the Slovak grounds is 200 times more than we consume. Let us be "enlightened" to see its potential – our potential.

More on this topic

- Energoportal – information about sustainable energy, managed by OZ Priatelia Zeme-CEPA
- Envidat – a database of environmental data made available to the public and managed by the Slovak Environment Agency
- Euractiv – a news portal about what is happening in the EU, an article talking about the carbon neutrality of wood biomass
- Slovak Energy and Innovation Agency – funding programs, useful and practical information materials, data on energy consumption in households, materials for schools
- Slovak Association of Heat Producers – list of heat producers and suppliers in 87 cities in Slovakia
- World of energy – educational portal in Czech about energy and technologies
- Regulatory Office for Network Industries – list of residential electricity and gas suppliers

Let's go!

2030 Climate Target

Reducing greenhouse gas emissions by 20% by 2030 compared to 2005 (Environmental Strategy 2030).

What's the hold-up?

Since the beginning of the Industrial Revolution, our society has built systems, networks and devices that power it by combustion of fossil fuels. Changing these systems is difficult and time-consuming. We are also limited by our own technologies, which cannot yet utilize 100% renewable energy sources without producing CO_2 emissions. And maybe it's because of us, people, and our consumption habits. It is safe to say that we already have solutions today on how we can efficiently use as much energy as we need for our lives. This way we don't get stuck, but rather contribute to climate change mitigation.

THE CHALLENGE

Don't let her sit in the corner

Can you imagine that just an ordinary lid is a super "fighter" against climate change? When you use it at home during cooking, you use up to four times less energy than without it. In addition, you do not have to vacuum the escaping fumes with a hood, which reduces the additional amount of greenhouse gases. With the right cooking habits, we can significantly save time, energy, money and the planet.

1. Use a lid when cooking at home.

2. Check that it sits correctly on the pot. When the contents start to boil, reduce the heat or turn it off completely and cook the food on the residual heat.

3. You can also do this experiment: Cook the same amount of pasta in the same amount of water, once with and once without a lid. By how many minutes was the cooking time reduced?

4. If you feel like it, write a short story about your experience or the result of your experiment on Ewobox.

Around the Sun

OBJECTIVES:

- Understand the meaning and value of the sun.
- Notice changes in nature and human behaviour associated with the activity of the sun.

THINK & FEEL

(Evocation)

Our lives revolve around the sun, both literally and figuratively. During the morning circle, show the children the **Centre of Life** image from the Handouts. Discover together what is drawn on it and why the sun is in the centre. What feelings does the picture evoke in the children? Is the image warm or cold?

Put all your ideas together and use the image to create a joint story in which the sun plays the main character. In addition to the verbal exercise, give yourself a physical warm-up in the rhythm of the **In Motion poem** (in Handouts).

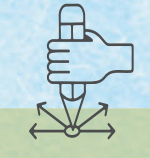
KNOW & EXPLORE

(Awareness)

Talk about the four seasons. Depending on how hot the sun is, it is warmer or colder outside. And all of nature, including us, adapts to these temperature fluctuations.

Give each child a **colouring page** featuring a bear, swallow, dandelion, or person found in the Handouts. Describe together what the individual creatures and plants in the pictures look like and where they live. The children‘s task is to colour them and think about what they do in winter so that they don‘t get cold. (*A dog‘s fur becomes thicker. A swallow flies to Africa. A dandelion hibernates in the form of a rhizome and seeds. A person dresses warmer and turns on heat*).

See for yourself how important it is to dress properly. When it‘s cold outside, the kids strip down to their tank tops and run outside for a quick moment. When it‘s warm outside, they put on more clothes and spend a while like that. They will have an experience they will not forget so soon.



ACT & CHANGE

(Reflection)

Distribute the **Sun Heads** worksheet to the children. First, talk together about whether we have more than one sun or just one. What do the different rays on individual sun heads mean? (*sometimes it is more hot, sometimes less*). Match the four heads together to the four seasons. The task of the children is to trace dotted lines and draw for each season what „clothes“ nature wears in this season and what they are wearing.

Create a sun mandala while you‘re outside. On a larger, flat surface, make several concentric circles out of the string. Fill each sun layer with different freely available natural materials. The mandala symbolizes the sun bringing everything on Earth to life.

Centre of Life

Green World Competition: Sára Župníková, "It yould be nice here, if everobody separates waste", 10 years old, Róbert Tatár Private elementary school, Banská Bystrica

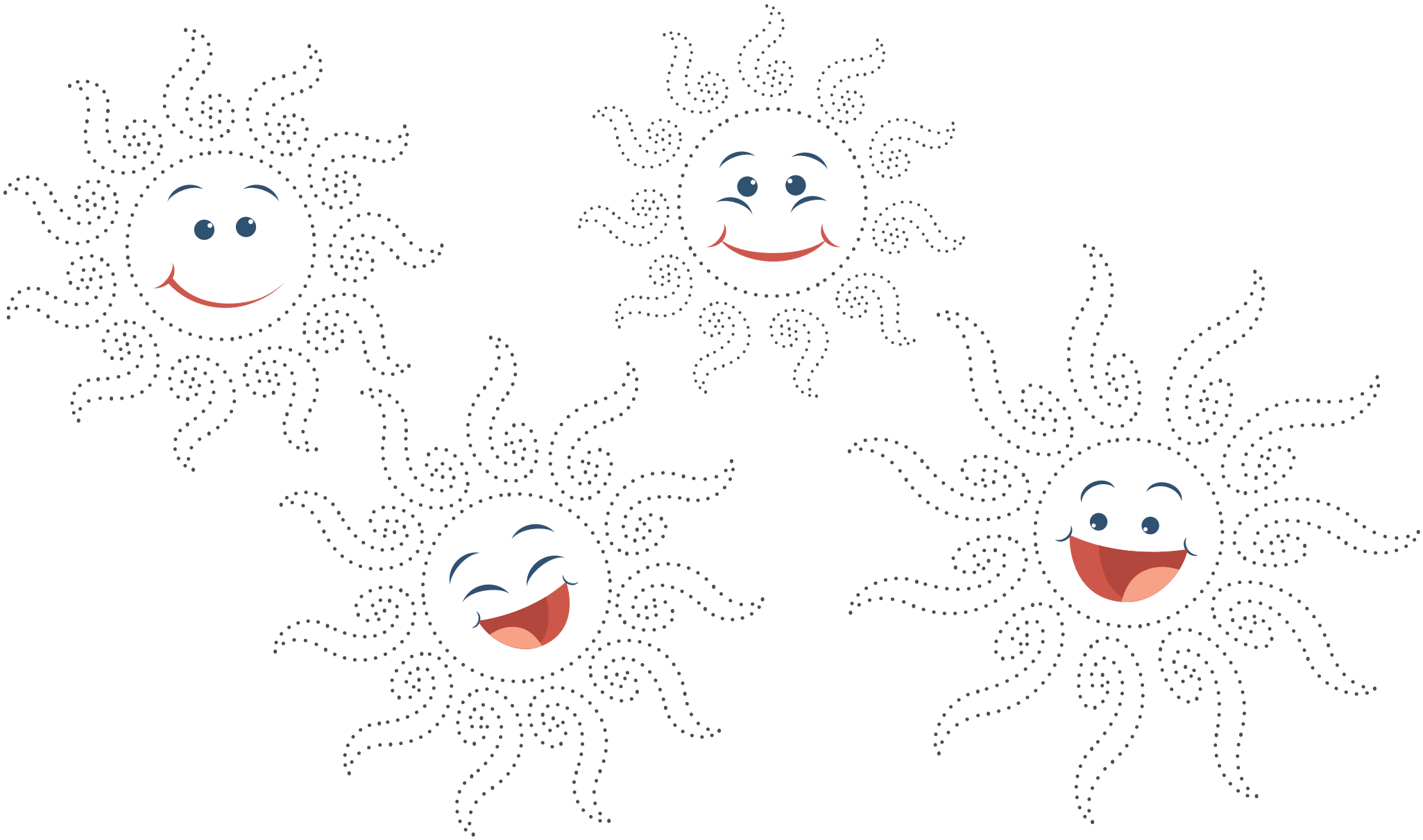
In Motion

IN THE MORNING BRIGHT AND EARLY,
The children lie on the carpet or in their beds,
THROUGH THE WINDOW THE SUN GREETS ME WARMLY.
they wake up,
JUMPING OUT OF BED I STRETCH MY ARMS WIDE,
they jump,
THEN I HURRY TO BRUSH MY TEETH SNOW WHITE.
they stretch out their hands and mimic how they brush their teeth,
ON MY WAY TO SCHOOL I HOP AND HOP,
they jump into the middle of the free space,
SEEING ALL MY FRIENDS IS JUST THE TOP.
they form a circle and hold hands,
THE SUN IS SHINNING AROUND ME ALL DAY LONG
they spin in a circle,
ONCE IT IS GONE MY COZY BED IS WHERE I BELONG.
they lie down on the carpet or back in their beds.

Author: Jana Bačkorová

Colouring pages

Sun Heads



Source of My Energy

OBJECTIVES:

- Know that the sun is the main source of energy for life on Earth.

Elementary school

THINK & FEEL

(Evocation)

Ask students this question: What is the main source of energy for life on Earth? Write the answers on the board. Only then give students the **Spot the Difference** worksheet that gives them the answer. It's the sun. There are 10 differences. Can you recognize them?

Divide students into three work teams and give each a picture from the **Three Connections** worksheet. Their task will be to explain what the picture shows and how it relates to their life. At the end, explain the individual pictures together (*the sun's energy is converted into water and wind energy, solar energy is stored in food*). Talk about different types of renewable energy.

KNOW & EXPLORE

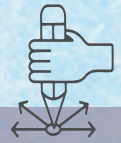
(Awareness)

To demonstrate the importance of energy in our lives, conduct three experiments:

1. LIGHT – Cover a plant in the classroom or on a shelf with a black plastic pot and watch what happens when no light reaches it (*it gradually fades and dies*). Identify the light sources in the classroom. Where does this light come from?

2. HEAT – Examine what is hot or cold in the classroom (hallway). Students can use their own palms (they can also use thermometers). You can create a record-keeping system for them. For example, use red and blue stickers that express the feeling of hot and cold, or create a class plan with marked stations to explore and colour them red or blue (a wall, wall with an insulating film, window, radiator, floor, carpet, light sources, microwave, kettle after boiling water, tea, classmate, etc.) Compare your results and talk about the children's feelings during the examination. What felt nice and what didn't? Why are some objects in the classroom warm? Where does the heat come from?

3. PEOPLE – Check whether people are also a source of heat. Shake each other's hands and see who has warm hands and who has colder hands. Ask them what is the reason. Where does our energy come from?



ACT & CHANGE

(Reflection)

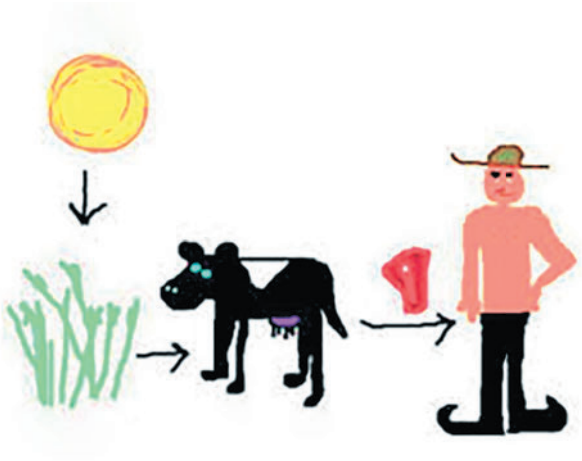
Play the fun Adapt! game with students. First, pantomime how different animals adapt to temperature changes: swallows fly to warm countries (*wave your hands*), hedgehogs go into hibernation (*sit on a chair and sleep*), dogs sticks out their tongue (*stick out your tongues*), elephants flaps their ears (*hold your hands on your ears and move them*), bats hibernate in colonies (*create groups*), giraffes are cooler high above the ground (stand on your tiptoes and put your arms up), humans put more clothes on (*put on a sweatshirt*). First, name each animal slowly. The student's task is to respond with the correct movement. Students who answer late or incorrectly get eliminated from the round. Gradually speed up the game. The winner is the one who was able to adapt the best!

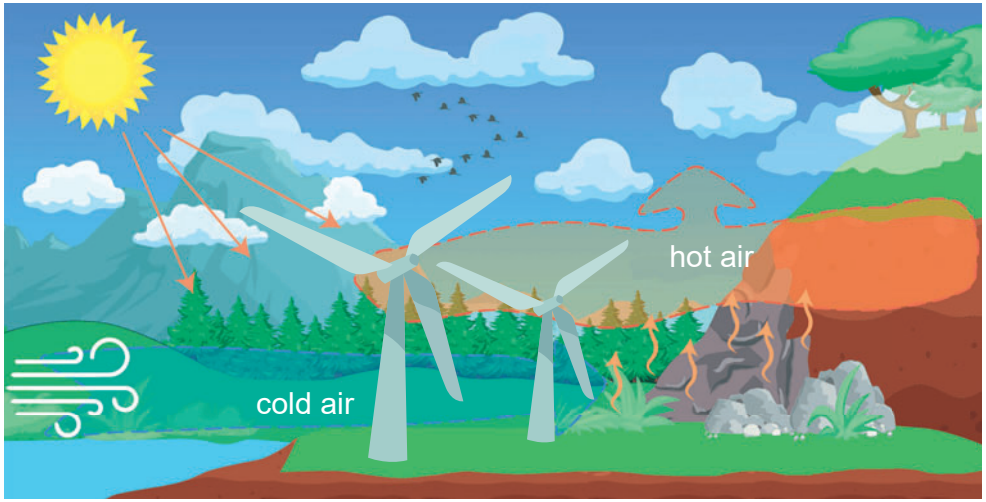
Make the **Water Cycle in a Bag** according to the picture in the Handouts. You can find a lot of great tutorials **online.** The knowledge that the sun is the driving force behind water energy is clearly explained to children.

Spot the Difference

Green World Competition – "Hope", Natália Mihuliaková, 9 years old, Sitnianska Elementary school, Banská Bystrica

Three Connections





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https://northfinder.com/sk/blog/post/58_vietor-zaujimavosti-a-rady-pre-turistov?page_type=post
https://slideplayer.com/slide/9639428/

Water Cycle in a Bag

Image source: https://www.hravozdravo.sk/hravo/kolobeh-vody-v-saciku/

Energetically and Economically

OBJECTIVES:

- Know where the energy we use comes from.
- Know ways to save energy in everyday life.

Middle school

THINK & FEEL

(Evocation)

Begin the topic of the lesson by thinking about two questions: What is an energy source in the classroom (or at home)? Where does this energy come from? Have students, individually or in groups, complete the **Two Pies** worksheet in the Handouts. The task is to correctly assign the chart elements to the individual values. Students can check the correct answers themselves using the sources listed and the electricity bill in their household. Find out student's feelings and ideas on the question: Why is it important to know information about energy consumption?

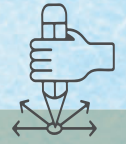
KNOW & EXPLORE

(Awareness)

Tell the students that they will take on the role of **reviewers of the article** on Household Electricity Consumption (you can choose a different article or just a part of it). Divide the students into groups, each playing a different role: 1. Key player – finds and presents key information and the main objective in the text, 2. Highlights finder – will focus on information that interested or shocked him, 3. Connector – looks for connections to his own experiences and life, 4. Interviewer – prepares text-based questions for the discussion, 5. Doubting Thomas – selects parts of the text that he strongly disagrees with or does not trust, 6. Illustrator – attempts to capture the content of the text in the form of an image.

You can remove some of the roles listed or add your own. Depending on the size of the text chosen, give the students the time they need to read and complete the task. Then discuss in groups. Ideally, the students take turns so that everyone has a chance to speak. After the group work, ask the students how they felt in their roles, how they worked with the article, what information appealed to them the most, and how it relates to our everyday lives.

Based on the advice in the article, the students can create the **Saving electricity at home** questionnaire themselves. Then implement it, evaluate and present it together. See the Handouts for some tips on questionnaire items.



ACT & CHANGE

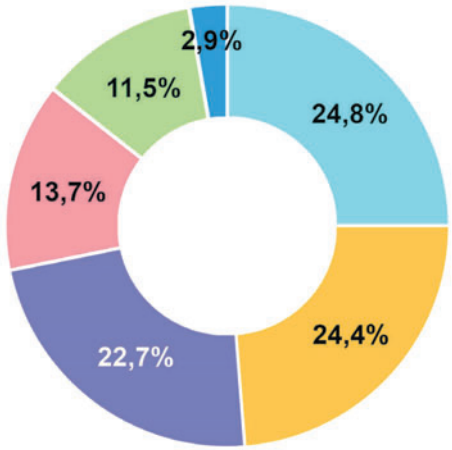
(Reflection)

To expand but also reinforce what they have learned, task the students to develop the From **Source to Socket** project. Their task will be to trace and then draw or describe the path of electricity from its source to the power socket in their home. They can draw a picture of their household, highlighting various electrical appliances and also showing how they manage or fail to reduce electricity consumption. After presenting the projects, praise the students and encourage them to practice good habits so that they become role models for those around them.

You can also implement a similar lesson and all the activities described based on the motives of the article on Household Electricity Consumption and complete it with the **From Source to Radiator** project.

Two Pies

Match the individual elements to the parts of the pie chart and answer the questions:



Heat (nuclear fuel)

Electricity from hydroelectric power plants

Oil and oil

RES and waste

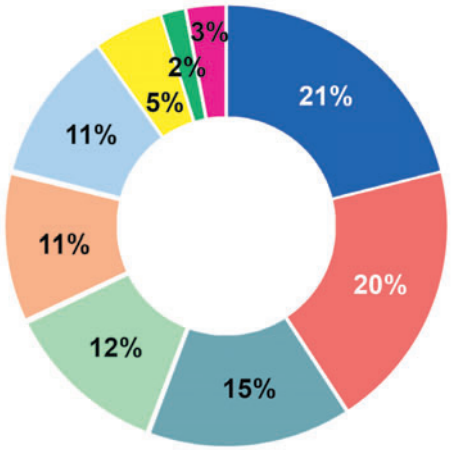
Solid fuels

Gaseous fuels

What sources does the energy consumed in Slovakia come from?

Do you know what the abbreviation RES stands for and what it means?

Source: Enviroportál, Energetický mix 2020



Electronics

Cooking

Laundry

Other

Air conditioning

Washing

Lighting

Ironing

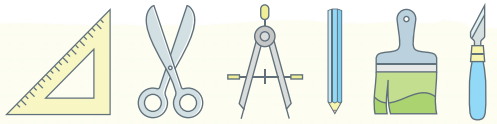
Cooling

What do we spend the most electricity on at home?

What surprised you the most?

Where can you find out what sources the electricity used in your home comes from?

Source: SIEA
Average monthly electricity consumption of a family of 4 in a model house.



Saving Electricity at Home

Which devices have an energy label and how many have a green arrow?	
Is our refrigerator in a cold spot?	
How many degrees are in our refrigerator?	
Do we use a lid when cooking and heating food?	
Do we have aerators installed on the batteries?	
Do we only do laundry when the washing machine is fully loaded?	
Do we steam the laundry when ironing?	
Do we only heat as much water as we need in the kettle?	

Do we work at home on a laptop or a classic desktop computer?	
How big is our TV screen?	
Do we have devices in standby mode at home? How many are there?	
Do we use standby killer extension cords or extension cords with a switch?	
Have we purchased an electricity consumption meter that shows us the exact consumption of the devices connected to the socket (in operation, in standby mode or when switched off), and calculates the amount of CO_2 emissions and how many Euros does it cost us?	
How many old, classic light bulbs still light up our rooms?	
What principles have we decided to apply at home?	
What energy sources does the electricity we consume come from?	

Success Story

OBJECTIVES:

- Evaluate the strengths and weaknesses of different climate protection technologies.
- Distinguish the effectiveness of specific measures to reduce energy consumption.

THINK & FEEL

(Evocation)

Give students the **Human Power** math problem provided in the Handouts (*the result is 2.4 kWh and 100 watts*). Reflect together on the additional energy we use to support our needs and lifestyles. Find out whether the students know the effective measures to reduce energy consumption and thus CO_2 emissions. Sometimes we need to invest money, but sometimes all we need is our time and a change in habits.

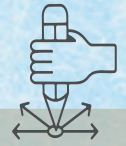
KNOW & EXPLORE

(Awareness)

In this section, you will explore the **Pros and Cons** of selected technologies for reducing energy consumption, CO_2 emissions and mitigating climate change. You can choose between different procedures: 1. The students go through the individual technologies and prepare the worksheet (included in the Handouts) independently. 2. Or you can assign each person a technology to learn for the next lesson. The students then form pairs to introduce their technology to each other. In the end, they exchange the technologies. In the second round, everyone forms a new pair and passes on the newly learned information to a classmate. You can continue this way several times until the students have exchanged all the information with each other. At the end, discuss the information gained and report on the technology students would choose as the best.

Emphasize again that it often does not require an expensive investment to use energy efficiently. For example, a lot can be achieved by adopting the right habits when using electrical appliances at home. Provide students with the information from the **Standby** worksheet. Their task will be to find out how many devices in their home have a standby mode and how much they could save annually by using them correctly. Evaluate the results and focus on the solutions.

An electricity consumption meter can be a great tool for experimenting with this topic. A better one costs around €20 and measures CO_2 emissions and energy consumption costs in Euro. If you have one, use it at home or school.



ACT & CHANGE

(Reflection)

A great ability of a person is to be able to learn from his own mistakes. We can imagine what our future will be like and work to achieve it. We should develop this ability in students here and now so that they can find the right solutions for us and the planet in the future.

Create a diary named Our Success Story. Tell the students to imagine a future in which we have already solved the problem of climate change. Divide them into the task areas they should be addressing and emphasize that they should not limit their solutions to currently available technologies. The magazine sections can look like this: Cooling, Heating, Lighting, Electrical appliances. Start with a provocative question: “Do we need a light bulb or lighting? Do we need a refrigerator or food refrigeration?” Have the students discuss and think through the entire system.

Human Power

Aký je priemerný výkon človeka, keď vieme, že jeho denný príjem potravy predstavuje zhruba 8 640 kJ (kilojoulov)?

Our daily energy consumption = ... kWh (kilowatt hours)

Our average hourly output is = ... W (watts)

You can get to the result in different ways. Here are some helpful formulas for the calculation:

1 watt = 1 joule per second

W = 1 000 × kWh/h

P (W) = E(J)/t(s)

1 hour = 3,600 seconds

E(kWh) = P(W) × t(hr) / 1000

An average family of four in Slovakia consumes around 14,500 kWh per year (Source: SIEA).

How much additional energy do we use per day and per person?
What does this energy consumption include for you and where does it come from?
Do you know how to reduce your own energy overconsumption?
What does the so-called guarantee of electricity origin from RES mean?

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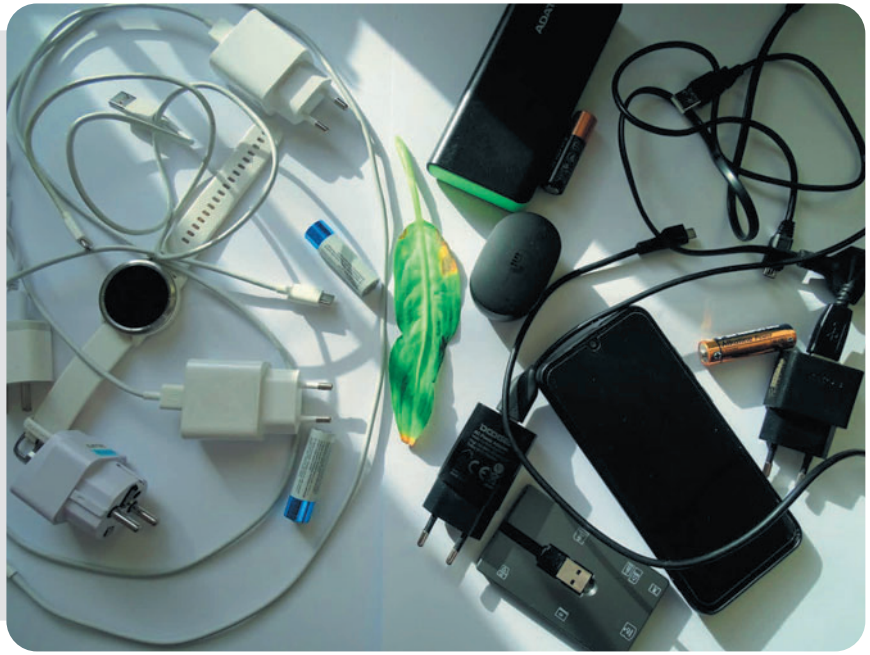
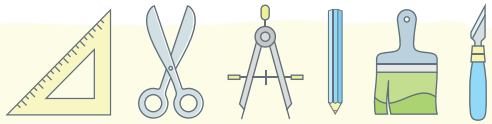


EnviroSpectrum Competition: Green energy



Pros and Cons

Describe the environmental technologies and practices listed, for example from the perspective of:

- input investments and their returns,
- local conditions,
- efficiency, energy savings, energy prices,
- energy source, CO_2 emissions and impact in terms of mitigating climate change

You can also expand the table to include other technologies.

	Pros +	Cons –
Energy passive house		
Photovoltaic modules		
Reducing the internal temperature by 2°C		
Clay plaster		
Solar collector		

	Pros +	Cons –
Air and water recupa-ration		
Insulation (windows, roof, walls, floor)		
Heat pump		
Biomass boiler		

Source: Inspired by an activity from the "Environmental Technology" programme of the Kaprálův mlýn Ecological Education Centre.

Standby

The result of testing devices in different modes:

Device	Average consumption (in kWh/year)	Price (in €)
WiFi router (always on)	90	13,50
TV (in standby mode)	123	18,50
Cell phone charger (in the socket, not charging)	2,34	0,40
Clock radio (on)	18,09	2,70
LCD computer monitor (sleep mode)	12,42	1,90
Laptop (sleep mode)	141,93	21,30
Laptop (switched off)	80,10	12,00
Modem, DSL (on)	48,33	7,20

Device	Average consumption (in kWh/year)	Price (in €)
Inkjet printer (off)	11,34	1,70
Satellite set-top box (switched off via remote control)	140,94	21,10
Coffee machine (off)	10,26	1,51
DVD player (off)	13,95	2,10
Gaming console (in standby mode)	210,06	31,50
Microwave (in standby mode, door closed)	27,72	4,20

Source: najomne.sk, fontech.startitup.sk

When calculating the price in the table, the sum of €0.15 per 1 kWh of electricity was calculated. Find out how do you use individual devices at home. Then look at your electricity bill and calculate how much you could save by using it correctly.

If you have an electricity consumption meter, you can use it to measure the actual consumption of devices in different modes, but also the CO_2 emissions.

What solutions and measures do you suggest?

.....

.....

JANUARY

LET‘S MOBILISE

Let‘s mobilise

You need to know

The world as we know it today and our current level of comfort would not be possible without the intensive use of transportation. An efficient and sufficiently dimensioned transportation system is a necessity for economic development. Transporting people to and from work, school, leisure and entertainment is an essential part of our daily lives. Global market and economic growth are helping to make transportation one of the fastest growing sectors, with transport volumes increasing and **the world relatively shrinking.**

Individual road transportation, which is mainly represented by passenger cars, has experienced the most significant boom in Slovakia in recent years. Although car transportation is relatively new (given the age of human civilization), it has experienced an unprecedented boom over the past 100 years. **Cars were rare a hundred years ago.** Today they are a consumer product. In particular, passenger car transportation became quickly dominant. Public urban and municipal spaces are being adapted to cars, as is the intercity infrastructure, which has an impact on the overall character and distribution of the country. In this way, these spaces become less usable for the general public. They become dangerous and endanger the safety and health of the population.

The benefits of car transportation to our lives are undeniable from the perspective of human comfort, but is its rapid growth sustainable? One of the main disadvantages is the fact that the **consumer only bears part of the costs directly.** The rest of the negatives are paid by society as a whole in the form of costs for various “indirect impacts”, such as air pollution, expansion of transportation infrastructure at the expense of ecosystems, a deplorable traffic situation, but also climate change.

Let’s mobilise and get real

Transportation is the only sector where greenhouse gas emissions are still rising. The reason is the development of the automobile sector. Within the EU, it is responsible for 22.21% of the production of greenhouse gases that contribute to climate change (Source: EEA, 2021).

Within the transportation sector, passenger cars are the most significant producers, causing almost 43% of greenhouse gases. Road transport of goods accounts for 27%, water transport 14%, civil air transportation 13.4% and railways 0.4% of greenhouse gases from transportation (Source: EEA, 2022). By simple deduction, we derive the fact that car transportation is responsible for almost 10% of all greenhouse gas emissions in the EU.

Since the beginning of the 1990s alone, the number of passenger cars and heavy commercial vehicles in Slovakia has more than doubled, and further growth is expected. In the long term, the transportation sector in the Slovak Republic is responsible for 18% of all greenhouse gas emissions, of which up to 97% comes from road transportation (passenger and freight).

Let’s mobilize and think about our habits

Where is our society going (or driving)? Half-empty cars moving slowly in a convoy paint an unflattering picture of the waste of natural resources and irresponsible gambling with the future just for the sake of our convenience and our supposed sense of freedom. A car is a great thing, but do we need several in one household? Do we have to drive a car even for short distances? Do we need a car or rather mobility – to get around economically, ecologically and efficiently?

In cities and on short trips, conventional cars with internal combustion engines work less efficiently - they consume more fuel, produce more greenhouse gas and pollutant emissions, and take up a disproportionate amount of parking space (they take up one paid parking space in front the house and one in front of the workplace; there are parking spaces or entire parking garages reserved for them). As a species, cars are overpopulated on our roads. Let us therefore think about what beneficial effects a more moderate use of the car would have on us and those around us.

Let’s mobilise for change and take action

We have a variety of ways to contribute to more sustainable mobility. Some require a higher initial investment – for example, replacing an old car with a newer, more efficient one. But for most of us, it doesn’t have to cost a lot of money to prefer public transportation, walk, or ride a bike or scooter in the warmer months. Some decisions help us conserve the family budget – such as sharing a car with the family or sharing trips to work with colleagues. Choose those that take your local conditions into account.

Movement accompanies us from morning to evening, from birth to death. As we move, we influence climate change, which in turn affects our lives. Two final quotes about us humans and cars:

“Everybody wants to go back to nature. But no one on foot.“ (Werner Mitsch)

“He who sows roads will reap traffic.“ (Daniel Goeudevert)

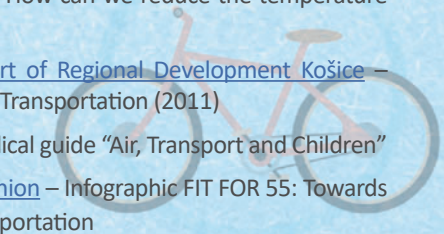
More on this topic

Agency for the Support of Regional Development Košice – Climate Change video: How can we reduce the temperature in the city? (2011)

Agency for the Support of Regional Development Košice – Climate Change video: Transportation (2011)

Life Populair – methodical guide “Air, Transport and Children”

Council of European Union – Infographic FIT FOR 55: Towards more sustainable transportation



Let's go!

2030 Climate Target

Support the development of combined transport. Remove obstacles in public spaces to support pedestrian traffic. (Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050)

What's the hold-up?

Time is what we keep missing. We race against time all day long. In the morning when we have to be on time for work and school. Work tasks have their deadlines, classes have their schedules, after-school classes and clubs start at a certain time. We are running out of time and cars seem to be the quickest solution. But what if everyone already has a car? What if everyone has two cars?

Fuel, parking and care for this means of rapid mobility are becoming more of a burden than an advantage in crowded cities. Nevertheless, it is difficult for us to do without the car as a symbol of freedom and independence. We keep finding many reasons why to hold on to it. Let's try to think about whether there isn't a better solution for our mobility.

THE CHALLENGE

Combine yourself

Contribute to sustainable mobility through your own efforts. It's your muscles that can significantly help reduce greenhouse gas emissions from transportation. How? All or part of the trip, exchange your car for a vehicle that uses your own energy instead of fossil energy. Another benefit is improving your health and budget.

Challenge procedure:

1.Combine the car with other means of transport (bus, train, tram, walk, bicycle, scooter, etc.).

2. Take a photo of yourself in action and send it to us. If you feel like it, write a short story about your new or previous experience on www.ewobox.

"Green World" competition, Lea Durošová

Tracking the traffic

OBJECTIVES:

- Be aware of the impact of traffic on the environment and human health.
- Prefer ecological means of transport over car transport.

THINK & FEEL

(Evocation)

Gradually imitate the sounds of each mode of transport and let the children guess which one it is. Talk about: What modes of transport do you know? Which ones have you already used? Which do you use most often?

Prepare images related to different modes of transportation (e.g. roads, bike paths, traffic signs, airports, railways, etc.). The children's task is to determine whether they belong to a car, bus, plane, train, bicycle or on foot. You can also implement the activity in the form of movement – place stations with replicas of modes of transport in the room: after showing the picture, the children run to the mode (station) to which they think the picture relates.

KNOW & EXPLORE

(Awareness)

Prepare small metal models of vehicles (e.g. train, car, truck, plane, ship), shallow containers, brushes, distempers and paper. Divide the children into groups. Their task is to choose a mode of transport, dip it in a container with distemper (or paint just the wheels with a brush) and print it on paper (drive on paper).

Ask the children what was created on the paper. Make it clear to them that vehicles leave a trace by which we can recognize them. How could they track it down? (*Cars - noise, roads, parking lots, traffic signs, intersections, traffic lights, exhaust fumes, oil slicks, gas stations, discarded tires; Ships - ship horns, ports, oil tankers; Airplanes - airplane noises, airport halls and parking lots, take-off and landing areas; Trains - typical noises, rails, train stations, signs and traffic lights.*)

ACT & CHANGE

(Reflection)

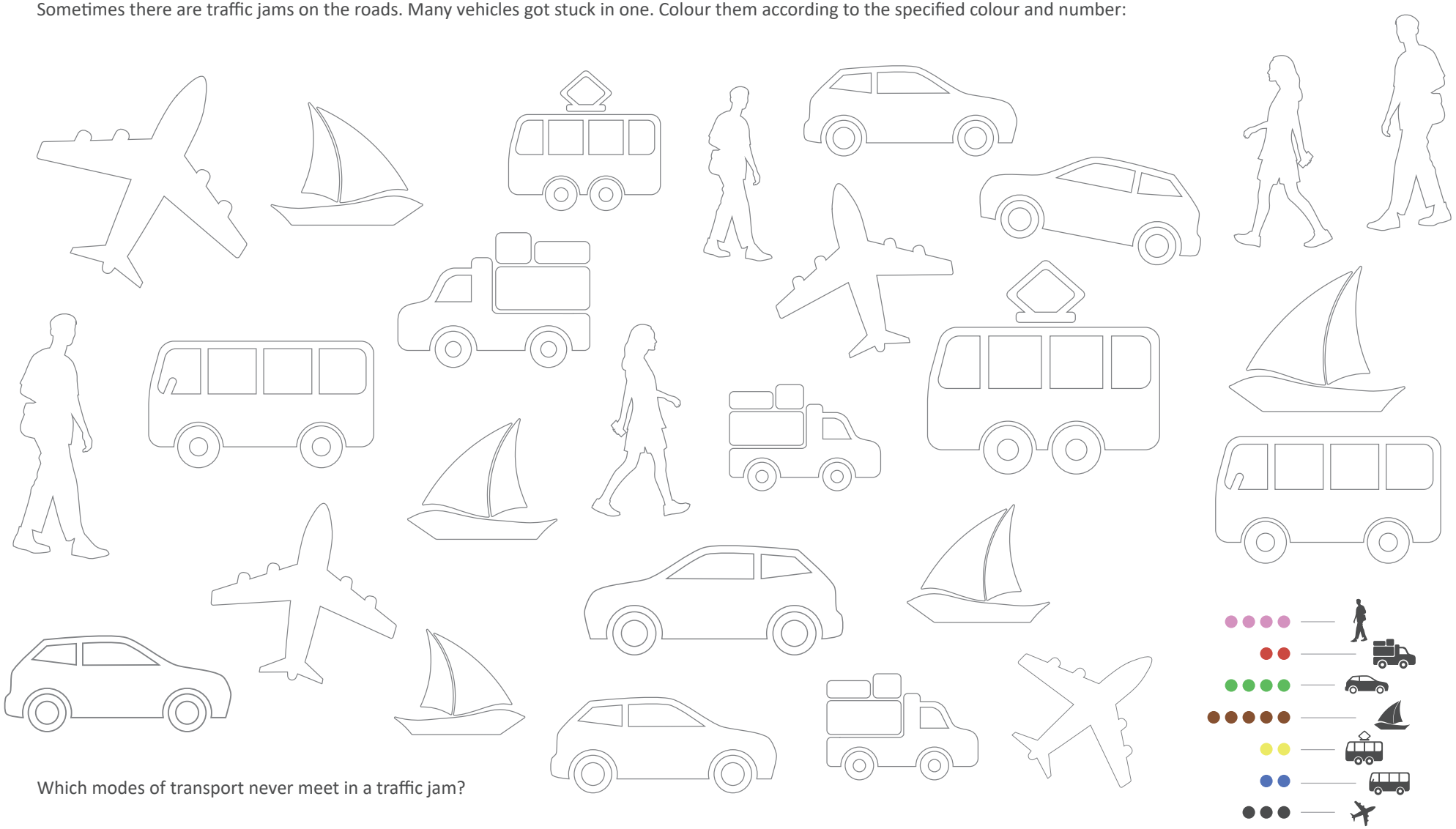
Explain to the children that vehicles also leave an ecological footprint, and let them find out for themselves that this is a negative footprint – an impact on nature. Find out if the children know which modes of transport leave the smallest eco-footprint (*walking, scooter, bike*) and why. Take a walk in the kindergarten neighbourhood and focus the children's attention on the modes of transport - their tracks, noises, note their type and number. Which of the were too many and which too few? How did the children feel about the walk – what did they like and what did they not like at all?

After returning to the class, have the children complete the **Traffic Jam** worksheet (in the Handouts). Have children ever been in a situation like this? When does this occur the most often? What happens then? Could it be avoided?

Talk about what mode of transport they would like to use to get to kindergarten and why. Plan your own Car-free Day with the children and their parents.

Traffic Jam

Sometimes there are traffic jams on the roads. Many vehicles got stuck in one. Colour them according to the specified colour and number:



Which modes of transport never meet in a traffic jam?

My Way to School

OBJECTIVES:

- Know the connection between air pollution and traffic.
- Identify traffic problems in your neighbourhood and suggest solutions.

Elementary school

THINK & FEEL

(Evocation)

Prepare pairs of chairs in a row (depending on the number of students). The chairs represent the seats on the bus. Ask students to sit on the bus. Give them step-by-step instructions: Students who came to school by car, by bus, by bike or scooter and finally on foot get off the bus. Each exiting group will gather at a different location. Talk to students about how they get to school and why they use that specific mode of transport.

KNOW & EXPLORE

(Awareness)

Using tape or twine, create an improvised street on the ground (it should include a road and sidewalks around the edges). You can decorate the area around your street with trees, objects or building models from different construction companies. Print out the pictures of cars, buses, bicycles, scooters, pedestrians and clouds of smoke from the **On the Street** worksheet (in the Handouts) and make as many as you need. Alternatively, you can replace them with props in the form of figurines and toys.

Students will work in same groups as in the previous activity. Give each member of the group a picture of the transportation (prop) based on how they arrived to school. However, only give one bus to the group that arrived by bus. Those who came on foot get a pedestrian figure. Ask students to arrange their transportation on the street you created. Discuss what happened on the street (*long line*) and why it is not good (*air pollution, waste of time, noise*).

Then give each student a cloud of smoke (again, just one for the group that travelled by bus) and ask each group one by one whether any pollutants are created when using their modes of transport. If so, they place a cloud of smoke on the street near their mode. (*Pedestrians – no, cyclists and scooter riders – no, bus passengers – place a cloud of smoke near the bus, car passengers – each place a cloud of smoke near their car.)*

ACT & CHANGE

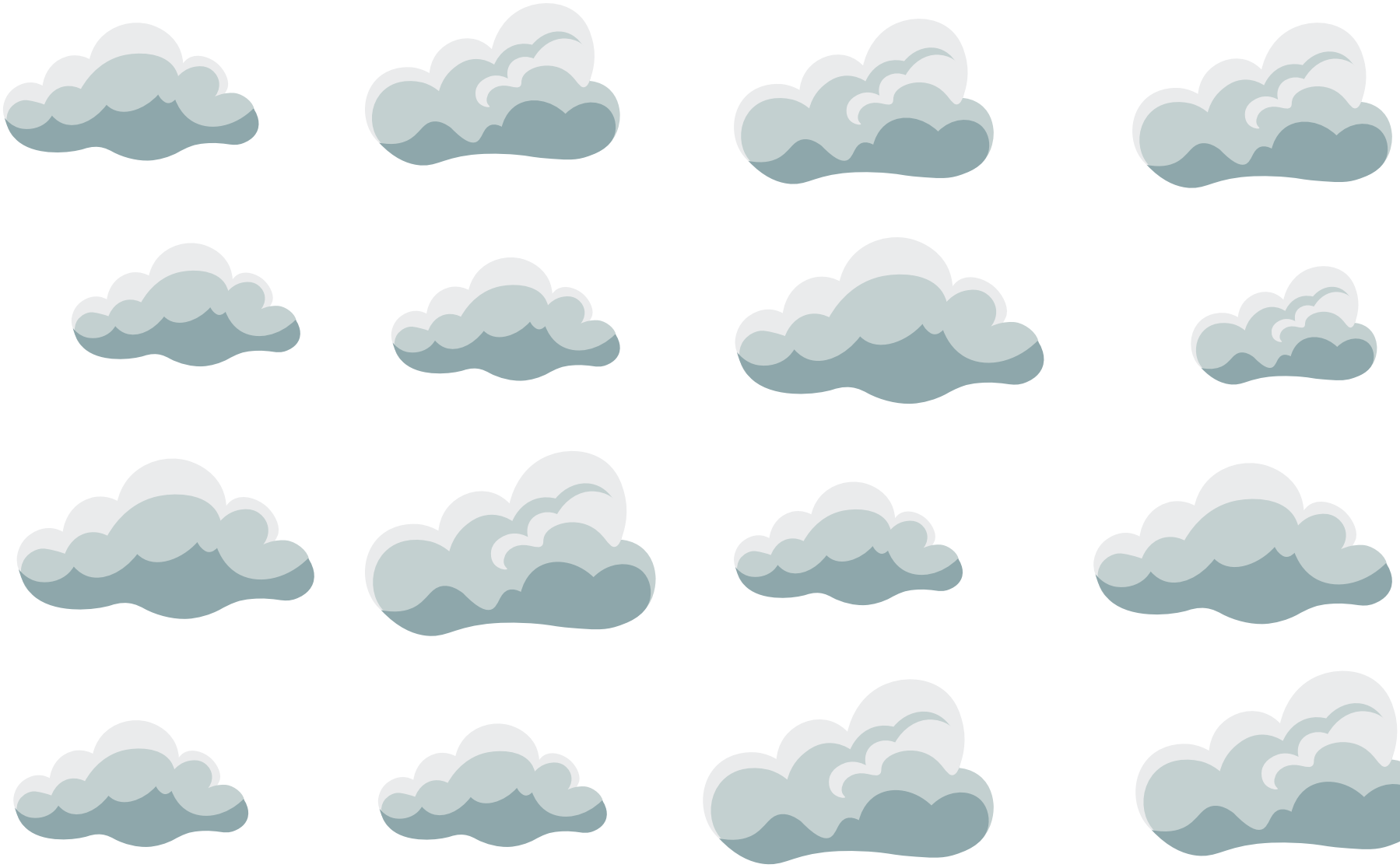
(Reflection)

Have students complete the **Labyrinth** worksheet from the Handouts. Talk about what they think is the best way to get to school – in terms of air pollution, health, safety, time and money. Why did the bus on your street only have one cloud?

Take a walk and record the traffic situation around your school. Together, create a so-called sensory map of the surroundings, mark problematic and, on the contrary, safe paths, suggest solutions and present them to the school principal.

On the Street

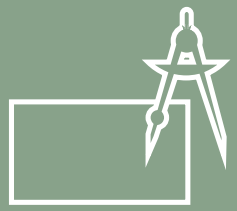
On the Street



Labyrinth

Use various modes of transport through a tangle of paths and find your way to school.

Engineers and Architects



OBJECTIVES:

- Be able to explain how transport contributes to climate change and impacts people and the local environment.
- Collaborate with others to identify opportunities for sustainable mobility around the school.

THINK & FEEL

(Evocation)

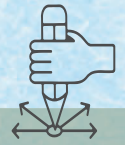
Play a video about sustainable mobility. Would they like such a change in public space? Tell them to close their eyes and imagine the street they live on or the neighbourhood at their school for a few minutes. What should this space look like? What are they missing? They can draw their ideas on paper or on the computer..

KNOW & EXPLORE

(Awareness)

Prepare the students for fieldwork. Divide them into three expert groups of engineers – commissions – and give each an **Assignment** from the Handouts. The task of each committee is to watch the corresponding video and complete the assignments set.

The groups present the results of their work to their classmates. Alternatively, you could hold a school-wide event linked to a campaign for a healthier and safer route to school. Discuss the connection between transport and climate change.



ACT & CHANGE

(Reflection)

Tell the students that after learning information about the current traffic situation around school, they will now become architects. Their task is to design (draw, create) a model of the school area in the same groups, taking into account their interests, health and safety, commuting, climate and environment.

Try implementing some of the students' suggestions. For example, organize a Car-free Day or the "Better a playground than a parking lot" campaign (close the parking lot for a day and use this space for fun and games). You can also find inspiration in the Walk to School poster.

Assignments for the commissions

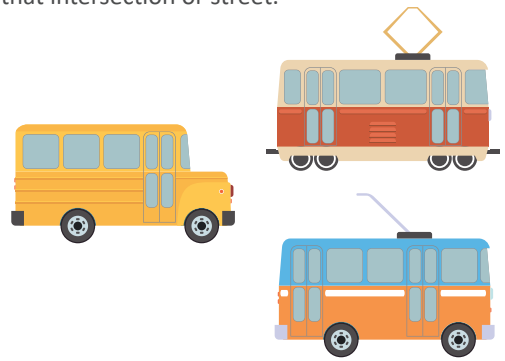
1. Group – Transport Commission

Watch the video: Climate change: Transportation (time stamp 2:47)

Observe a busy intersection or main road near your school for 30 minutes and try to figure out:

1. How many modes of transport (pedestrians, bicycles, cars, buses, trucks) passed by in the specified period?
2. How many cars were there? Calculate the percentage.
3. How many passenger cars carried only one passenger and how many carried two or more passengers? Calculate the percentage.
4. How does the traffic at this intersection/ road affect the immediate and distant surroundings?

Make a short video about the traffic situation at that intersection or street.



2. Group – Parking Commission

Watch the video: Climate change: How can we reduce the temperature in the city? (time stamp 4:13).

Learn about the parking situation near the school and try to find out:

1. Where, when and how many cars are parked near the school?
2. What illegal habits do drivers have when using the parking lot (running engine, ignoring restrictions)? Does it affect the safety or health of students?
3. Do parked cars make the traffic situation more difficult (obstruct the street or sidewalk, stop at the pedestrian crossing, block passage, etc.)?
4. How do parking spaces around the school affect the local climate? How do they work in summer when it's hot and when it rains? Do they help soak up precipitation where it falls, or do they drain the water uselessly?

Take a photo of the situation in the parking lot and make a presentation or photo collage.

3. Group – Commission for the Environment

Watch the video Climate change: Transportation (time stamp 2:47).

Observe the wider school area and perceive the impact of traffic on people's health, the climate and the local environment using sensors or devices. Try to evaluate:

1. Air quality (check air quality at the nearest monitoring station at dnesdycham.sk),
2. Noise level (according to Lehman's noise classification, noise reduction measures),
3. State of biodiversity and greenery (felling of trees, green islands, tree lines, damage to leaves),
4. Ambient temperature, precipitation drainage (built-up areas, overheating of the road environment, accumulation of rainwater after rainfall).

Survey students and residents. Find out what are their views on the quality of the environment concerning transportation.

Municipal council

OBJECTIVES:

- Know more about climate protection measures related to mobility.
- Explore and discuss societal issues and barriers to sustainable mobility.
- Compare different views on problem-solving and formulate your own opinion.

High school

THINK & FEEL

(Evocation)

Using a piece of string, form a 2.5m x 5m rectangle on the ground. Ask the students what they think a space of these dimensions might represent (*a parking space for a car*).

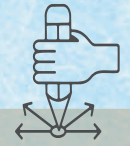
After revealing the correct answer, ask them: What is the maximum number of people that can be transported in a car? (*five*) Bring five students over to the parking space. How many bikes fit in a parking space? (*ten*) Send five more students to this place. Discuss how the streets and public spaces around the school are used and who owns these spaces. Is it people or cars? How is mobility related to climate change?

KNOW & EXPLORE

(Awareness)

Print out role cards and a bingo card for the **Municipal council** role-play (in the Handouts). Read the game introduction to the students and explain how it works. Everyone gets a bingo card and a role that they shall perform as best as possible. To enhance the gaming experience, we recommend that students familiarize themselves with their roles a day in advance – they can also adapt their clothing and props to suit them. Everyone studies their role and creates a name tag. Students can complete some of the character's information and personality and add something of their own to it.

After rehearsing the roles, everyone meets in the room where the imaginary Municipal council meets. You can walk around the room and meet other members of the council. Their job is to discuss with others, write the answers on their bingo cards and take notes. The game ends when the set limit has expired or all the players have filled out the cards.



ACT & CHANGE

(Reflection)

Discuss the role-play with the students and ask the following questions: What was it like for you to be this character? Did you experience strong emotions during the game – which ones? Have you met someone on the Municipal council whose behaviour surprised you (un)pleasantly? Who is the most affected by the traffic problem described? Is the current transportation system sustainable? What problems, apart from the local ones, may it bring in the future? What did this game give you, what did it make you realize? Is there a similar problem in your area? How would you solve it?

Discuss which interests are on the side of traditional transport and which obstacles stand in the way of sustainable mobility.

Municipal council

Game introduction

Vahanov is a district city with about 20,000 inhabitants and can be located anywhere. Like most cities, it has experienced an increase in the intensity of individual road traffic in recent decades.

Since Vahanov is a district city, the majority of traffic comes from people from the catchment area, which has around 70,000 inhabitants. The location of the city is also problematic, as it is dominated by a wide river on one side and a mountain range on the other. An main road runs through the city, but it cannot cope with rush hour traffic. Extensive traffic jams form on the road and drivers have become accustomed to taking shortcuts through residential areas of the city.

The shortest detour on the congested main road is the National Revivalists Street, which connects the local industrial area with the city centre. However, like most streets in the city, this street is not designed for the volume of traffic that flows through it. This has been a problem for many years. Collisions continue to occur due to the large number of cars and excessive speed. Of course, the residents of National Revivalists Street did not identify with the given situation and protested in front of the municipal council several times over the last two decades.

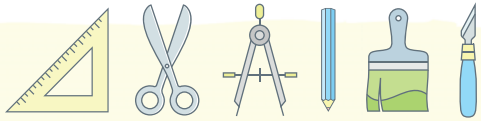
A few years ago, their protests were heard and the entire affected part of the city experienced a significant change. Experts from a nearby university have drawn up a new plan for organizing traffic based on the experience of larger cities. Several streets, including National Revivalists Street, were made one-way in selected sections to distribute traffic across multiple streets and facilitate the movement of pedestrians and cyclists (including the construction of a bike path).

The residents of National Revivalists Street were happy because the traffic density decreased drastically. However, residents of the side streets, where a part of the traffic was diverted, and those who used to shortcut their route through the city via National Revivalists Street were dissatisfied.. The decision caused considerable controversy, even hysteria, throughout the district, fueled in part by the local media, local politicians and various interest groups.

Due to this controversial traffic regulation, the mayor behind this change did not defend his mandate. A new mayor took office and claimed during the election campaign that this regulation could not remain as it is. A new local council will decide on the traffic situation in the city, in which each population group will represent their interests. The proposal to return traffic to its original state, and therefore the cancellation of one-way roads and the planned cycle path, will be discussed.

It‘s hard to predict how it will turn out. Only one thing is certain: the atmosphere will be extremely tense.

Notification. The city of Vahanov and all characters in the game are fictional!



Cards with roles

Residents of the National Revivalists Street

Name: Jozef Kianička

Profession: Pensioner

Age: 72

Address: 66 National Revivalists Street, Vahanov

Character: grouchy, passive pensioner

My name is Jozef and I have lived on National Revivalists Street practically since I was born. When the part of the street where I live was turned into a one-way street, I was very happy because the situation was alarming before. There were so many problems that I don‘t even want to name them. However, I can, for example, mention the problem that, in addition to the passenger traffic towards the centre, fully loaded trucks also drove on our street. The biggest problem was the loaded mixers from the local concrete plant during the construction of the mall. They shortcut their way through the city streets and I still remember how the whole house shook as the loaded mixer whizzed by. We are left with several cracks in the surrounding walls as a reminder. I don‘t know what I‘ll do if things go back to the way they were.

Name: Ivan Krasňanský

Profession: Machinist

Age: 52

Address: 54 National Revivalists Street, Vahanov

Character: grouchy, active citizen

My name is Jozef and I have lived on National Revivalists Street practically since I was born. When the part of the street where I live was turned into a one-way street, I was very happy because the situation was alarming before. There were so many problems that I don‘t even want to name them. However, I can mention, for example, the problem that cars were travelling on the road at excessive speed, which led to several collision situations. My house is on a slight curve and there have been several situations where a car has missed a curve and ended up in my fence. I repaired the fence twice, then I could not be bothered anymore. But I‘m not the only one, a speeding driver destroyed the entire gate of one of my neighbours, and someone else‘s gas meter was broken resulting in a massive gas leak. I don‘t even want to imagine what could have happened if there had been a spark enough... After the road was changed to one-way, these problems have almost completely disappeared. I am fundamentally against the situation returning to its original state.

Name: Eva Navrátilová

Profession: Student

Age: 19

Address: 42 National Revivalists Street, Vahanov

Character: horrified, active student

My name is Eva and I have been living on National Revivalists Street for some time. I‘ve had a problem with the intensity of local traffic for a long time. A big problem is to exit your own property with your car. I won‘t even talk about how dangerous the situation is for several local families with children. We are lucky no tragedy has happened yet. However, those who regularly got hit were various pets – cats and dogs, more than one neighbour lost an animal that wandered into the street. We were very happy with the one-way street, because it has become a nicer and safer place to live in the last year - I hope that the situation will not change fundamentally.

Name: Peter Havran

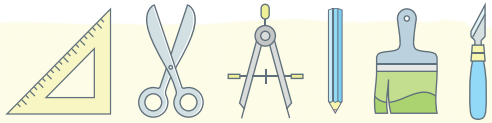
Profession: Businessman

Age: 42

Address: 12 Štefánikova, Vahanov

Character: local “Know-it-all” guy

My name is Peter, although I don‘t live on National Revivalists Street, I own a property there that I rent out. I bought this house as an investment and I don‘t like the idea of turning this street back into a two-way street as it seriously jeopardizes the value of my investment as well as the amount of rent I can charge. As real estate agents say: location is the most important thing when making a choice. I may have a nice house with property near the city centre, but if they‘re racing around the fields like they‘re on a race track, it will not matter. I don‘t plan on losing money from that house just so local Rednecks can drive around downtown like kings. Let them ride the bus.



Cards with roles

Residents of the National Revivalists Street

Name: Martina Polesná

Profession: General practitioner / activist

Age: 38

Address: 14 National Revivalists Street, Vahanov

Character: pextremely motivated, vocal activist

My name is Martina, I work as a GP in Vahanov and live at the intersection of the National Revivalists and V-Day streets. There is a lot of traffic at this intersection and I am very concerned about the impact of traffic on my family's health. Before 2022, when National Revivalists Street had a two-way traffic, it was terrible. The problem was, of course, the exhaust gases, but since we live near an intersection, I also have to mention the wear and tear on brakes and tyres – this creates a not-entirely healthy mixture of gases and fine dust particles that are deposited in the lungs and can end up in the lead to significant health problems in the future. After the introduction of one-way street, traffic volumes decreased by almost 60% and the situation became more sustainable, but there is still a lot of room for improvement. I don't know why we should surrender to the comfort of people from the catchment areas - if we accommodate them, the situation will hardly improve, they will just buy more cars and the situation will get worse. The city should try to give greater priority to public transport and eliminate private transport.

Someone in the council needs to say it. This is not about some one-way street. It's the principle of the thing! There are too many cars on the streets, and it is not at all in the interest of the residents of Vahanov or the entire district that their numbers are increasing.

Other residents of Vahanov

Name: Gabriel Fiala

Profession: Self-employed

Age: 39

Address: 15 Freedom Ave, Vahanov

Character: indifferent egoist

My name is Gabriel and I live in Vahanov. Until 2022, we lived happily on Freedom Ave, a parallel street to National Revivalists Street. However, the peaceful life has changed by a stupid decision of the city council about the roundabout in our district. Until recently, our street was a quiet and pleasant place to live, children could play on the street and cars could park outside until the residents of National Revivalists Street demanded a change in the organization of traffic and half of the traffic from National Revivalists Street was forwarded to the Freedom Ave. I am ready to support any solution that guarantees us peace. I don't care where will the villagers go as long as they are not on my street. I don't care what the crybabies living on National Revivalists Street think. I don't care!

Name: Marián Kožiar

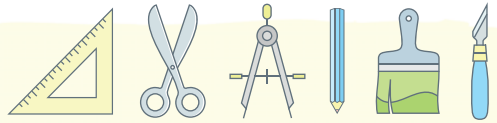
Profession: Businessman/city councillor

Age: 69

Address: 15 Tatranská Street, Vahanov

Character: elegant older gentleman

My name is Marián and I find the current situation very unfortunate since my company and my place of residence are on the opposite ends of the city and I have to drive. It's about 800 meters from the company to the town hall, because of the roundabout I couldn't take the most direct route and it took me almost 8 minutes! Crazy! I could have go by foot and it would be faster. The situation also affects my company as traffic has been also restricted in the area around my company. I have been working on this street for 35 years, going to work early in the morning and leaving in the evening. Not once have a professional came to speak with me about this. I didn't even notice that someone made a capacity calculation of the traffic. This was decided behind closed doors. But you have to come to the city to see it because it looks different than a warm office or a big police cruiser and different in everyday reality!



Cards with roles

Other residents of Vahanov

Name: Igor Kováč
Profession: Clerk/former city councillor
Age: 40
Address: 23 Komenského Street, Vahanov
Character: active citizen

My name is Igor and I was a city councillor in the last electoral term. Among other things, I was involved in changing the transport organization, which was a pretty big task since Vahanov suffered from unbearable traffic jams due to its size. The residents of the city were burdened the most. The aim was to redirect public transport back to the waterfront where it belongs and to distribute the rest of the traffic evenly across several streets. To be honest, I did not expect that this quite common solution would cause such a wave of discontent. If it is canceled, it could also jeopardize the raising of funds for the construction of the bicycle route, which should partly run directly along the one-way National Revivalists Street. Vahanov needs these investments like salt. The city is too small for everyone to drive a car! And let's not forget the ecological aspects – not just the immediate impacts like poor air quality, but also CO_2 emissions and climate change.

Name: Andrej Kučera
Profession: Teacher/Activist, Chairman of OZ Vahanov on a bicycle
Age: 31
Address: 16 Gagarinova, Vahanov
Character: concerned, active citizen

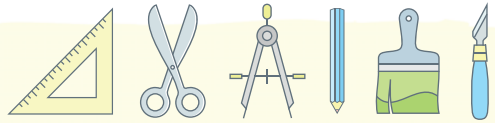
My name is Andrej and I am a young person who returned to his hometown of Vahanov after studying at the university. I'm trying to help to make Vahanov a slightly healthier and more progressive city than it is now. The situation is very bleak, especially when it comes to traffic. The fact that every family in the district has at least two cars is completely untenable, even crazy. People need to be shown that there are other alternatives to cars. Building a cycle path from the centre to the industrial park could have been a great opportunity to get some of the cars out of the city and show residents an alternative. People in the region have a relatively positive attitude towards cycling – unfortunately, they only see it as a leisure activity, not as a promising means of transport. They should get used do it. Everybody complains it is getting warmer every year, but if we want to stop climate change, we have to change our behaviour.

Name: Jozef Tóth
Profession: Mayor of Vahanov
Age: 60
Address: 5 Roháčska, Vahanov
Character: sophisticate, pleasant person

I have had experience in the role of mayor for some years. Except for the last term, when my opponent won and made a change in transportation organization, I have led this city for two terms. The current situation is quite unfortunate. I am well aware of the deplorable traffic situation in the city. It's quite cynical, but the disagreement with one-way streets was a good campaign issue for me, thanks to which I was able to stand out from my opponent, win the election and return to the mayor's seat. I understand the disappointment of the residents of National Revivalists Street, but it makes no political sense for me to accommodate them if I upset the majority of the city – my voters. This is politics. And besides, this is a practically insoluble problem - As a politician if you tell the citizens to switch from cars to bikes or buses, I can guarantee you will be out of politics. The environment is a big issue right now, but as long as they don't push us, I won't anger my voters. I shall leave it for the state to deal with. But don't tell anyone... Hush! As I said, one-way streets in the election campaign are done for. Being elected to office means most of the city is requesting it.

Name: Žofia Škrabáková
Povolanie: Journalist
Age: 30
Address: Malá Lomnica
Character: quiet observer

My name is Žofia, I don't live in Vahanov, I work as a journalist in a local magazine. This Vahanov controversy is quite unfortunate, but thanks to it our newspapers are sold, articles are read and people are actively discussing the issue on our social networks. I have my opinion on this: It is clear to every sensible person that the introduction of one-way streets was not invented over a beer somewhere over but by traffic experts. But I'll keep that to myself, it's better to stay aside and enjoy the praise of management and advertisers.



Cards with roles

Other affected people

Name: Milan Drevo
Profession: Businessman
Age: 35
Address: Horné Diviaky
Character: arrogant, flippant person

My name is Milan and I think one-way streets are a stupid solution. I don‘t want to be stuck in a traffic jam on the mainroad or suffering the one-way streets when it‘s possible to just go through National Revivalists Street! The fact that the local bums think the street belongs to them is not my problem. And don‘t even try to spread green delusions about riding the bus or bike. I‘ve earned my car, I pay my taxes and no scumbags, whiny cyclo-communists and crazy eco-greeters are going to dictate what I should do. I could afford to build a nice house in the country and not in crowded Vahanov, I won‘t give in to some crying plebs!

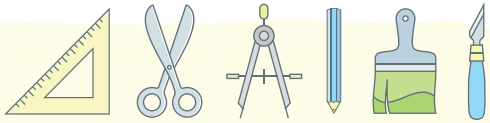
Name: Natália Kostolanská
Profession: Nurse
Age: 34
Address: Bobrovec
Character: flippant citizen

My name is Mária and I consider the situation on the National Revivalists Street to be a scandal. The introduction of a one-way street increased my commute to work in the centre of Vahanov by 5-10 minutes. It‘s unbelievable how selfish the locals are and how difficult they make lives for visitors to the city. They should realize that they live in a city and not somewhere in the hillsides, so they need to put up with it and stop whining. It is not normal for a few locals to bully the majority like this. And don‘t even mention buses to me. I don‘t have time for that. The local council should abolish one-way traffic and instead focus on the lack of parking spaces for commuters!

Name: Ján Hlava
Profession: Traffic expert, Technical University
Age: 55
Address: Budňa
Character: technocrat

My name is Ján and with the Technical University, we designed the Transport Generel in Vahanov to improve traffic in the city and support pedestrian and bicycle traffic. This also resulted in suggestions for changing the city traffic organisation. The previous management introduced some of the recommended measures at a critical area. However, they reduced transport comfort for part of the population and, on the contrary, improved it for others. It is a completely natural sign of any traffic restrictions in motor transport that are met with disapproval by injured parties. It‘s up to the city government to deal with it. If the new management decides to cancel the measures and fully implement them in the relatively distant future, traffic problems will only increase.

The aim was to unburden the streets, redirecting cars onto main roads and leading people onto bicycles or scooters, thereby reducing not only the number of cars on the roads but also dust particles and greenhouse gas emissions. In addition to the available data, the measures implemented are based on our own surveys and analyses. The problem solvers went through concerned locations several times together with the city administration and also conducted their own surveys. We discussed the proposed solution with the city administration and discussed it twice in the transport committee. All similar strategic documents are based on current and future state analysis and can never reflect the requirements of all affected parties. Above all, there are often contradictory opinions for various reasons, which are often the cause of traffic problems rather than the solution. I strongly reject the claims that the document was drawn up from the closed office and does not reflect reality.



Bingo card

Who does the proposal to restore traffic to its original state harm?	Who could benefit from restoring traffic to its original state and who is lobbying heavily for this proposal?	Who is considering a change of residence due to planned changes in the organization of transport?
Who is affected by the return of traffic to the original state like you?	Who has an idea of what should be done to solve a bad traffic situation?	Who is already acting in some way to solve the bad traffic situation?

FEBRUARY

I'M COOL AT WORK

I'm COOL at work

You need to know

Most of us regularly go **to work** and the younger ones **to schools and kindergartens**. We spend a significant part of the day there. Working in closed spaces, i.e. in buildings, requires a certain level of comfort. The Labour Code determines to the employer what working conditions he must create for his employees. One of the parameters is the temperature at the workplace.

For light office work, the Decree of the Ministry of Health of the Slovak Republic No. 99/2016 Coll. on health protection against heat and cold load at work determined a **minimum temperature of 19 °C and maximum of 26 °C** (for the year 2023). In schools and kindergartens, the minimum temperature of the room where children stay permanently for at least four hours is set at 20 °C.

In the locker room, corridors or other areas of the school, the temperature can reach even lower values (according to Decree No. 527/2007 Coll.).

You certainly know the situation when you sit at the computer in a jacket or blanket in winter. On the opposite, during the heat that sets in already in spring, you sweat again behind the windows of offices or schools without even moving a finger. **Next comes heating and air conditioning**, which increase not only operating costs but also our carbon footprint (the amount of greenhouse gases released into the atmosphere).

Staying inside buildings and thermal comfort at workplaces are therefore closely related to climate change. Energy consumption to ensure the ideal temperature contributes to climate change through greenhouse gas emissions. Conversely, climate change, with its extreme weather, affects the indoor climate in buildings, and thus also our well-being and health.

Since 2006, the **Act on Energy Efficiency Certification** has been in force in our country. Its goal is to optimize the indoor environment in buildings and reduce carbon dioxide emissions from their operation. It introduces the obligation of energy certification of buildings, which results in a "energy class" certificate. The highest quality buildings with the lowest energy consumption and the lowest energy operating costs have class A or B certificates. Completely bad and non-compliant buildings have class G.

All new buildings built since 2008 receive such a certificate automatically upon approval. However, most schools were built in the last century and therefore do not have it. Today, however, this audit is considered authoritative, for example, in projects focused on the reconstruction of public and private buildings.

At the time of the **energy crisis**, when electricity and gas prices rise significantly, energy prices also affect the functioning of various administrative buildings and schools. Employers must therefore implement steps to achieve maximum savings not only from an ecological but also from an economic point of view.

How to save energy, reduce costs and also the carbon footprint of operating our workplaces? The fact is that we still have a lot of room for improvement in this direction. High energy consumption can be due to waste of resources by building users and their consumption habits, incorrect equipment settings with inadequate maintenance, and the use of energy-inefficient equipment. The good news is that there are many ways to save energy and improve the indoor climate of buildings even without large investments and operation of the air conditioning .

In the Energy a Saving Manual (2023) the Ministry of Education issued recommendations for schools to save energy, divided into three categories:

Organizational measures – serve to make school operations more efficient (maximum use of buildings, limiting the operating hours of the gymnasium, closing the entrance doors, not darkening the windows in the winter, trainings for employees on energy saving, effective ventilation, releasing heating elements, revealing hidden energy consumers, not using electric heaters or air conditioning for heating).

Technical and operational measures are intended to improve operating conditions (venting the heating system, checking the temperature in the rooms and using the valves on the radiators, repairing or replacing batteries and heads with more economical ones, inserting aerators in water taps, shutting off hot water and lowering the temperature when not in use, reducing the temperature of hot water, thermovision measurement of heat leaks, etc.).

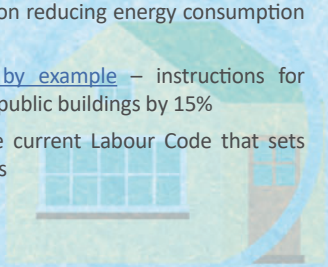
Investment measures represent a significant change in the technical and energy equipment of the school (automatic lighting switching, separate electricity and heat measurement for individual objects, insulation, replacement of windows, LED lighting, replacement of the heating system, etc.).

You may say: "After all, thanks to climate change, summer will start earlier, the heating season will not last long, and therefore we will save a little more." That might not be the case. The air temperature inside buildings quickly becomes unbearable and cooling runs on energy consumption again. **Operating the building is therefore energy-intensive all year round.** In winter we can put on another layer, but in summer we cannot figuratively "take off our skin". Adjacent concrete and asphalt surfaces, access roads, walls, parking lots and sidewalks also often contribute to overheating of buildings.

And how do you stay COOL at work or school even in the heat? Clean tap water beats it any time. Green and blue elements in the immediate surroundings (e.g. rain gardens, ponds, tree plantings, green walls or roofs), water seepage and green paved areas also contribute to cooling of your head and your microclimate as well.

More on this topic

- Building energy certificate – necessary information about the building energy certificate
- Ministry of Education, Science, Research and Sport of the Slovak Republic – recommendations for schools on energy saving, manual and frequently asked questions
- We Save for Us – a website with an energy-saving guide, manual, graphics, brochures and leaflets on reducing energy consumption at work and at home
- Public administration leads by example – instructions for reducing energy consumption in public buildings by 15%
- The Labour Code 2023 – the current Labour Code that sets temperature limits for workplaces



Let‘s go!

2030 Climate Target

Achieving energy efficiency at the level of 30.3% (Low-Carbon Development Strategy of the Slovak Republic until 2030)

What’s the hold-up?

To achieve this goal, the key sectors will be industry and buildings. For buildings, measures aimed at replacing old and non-ecological solid fuel heating devices with modern devices (using renewable energy sources) combined with insulation will have the greatest impact. However, these are investment-intensive projects whose implementation is also time-consuming and administratively complex.

THE CHALLENGE

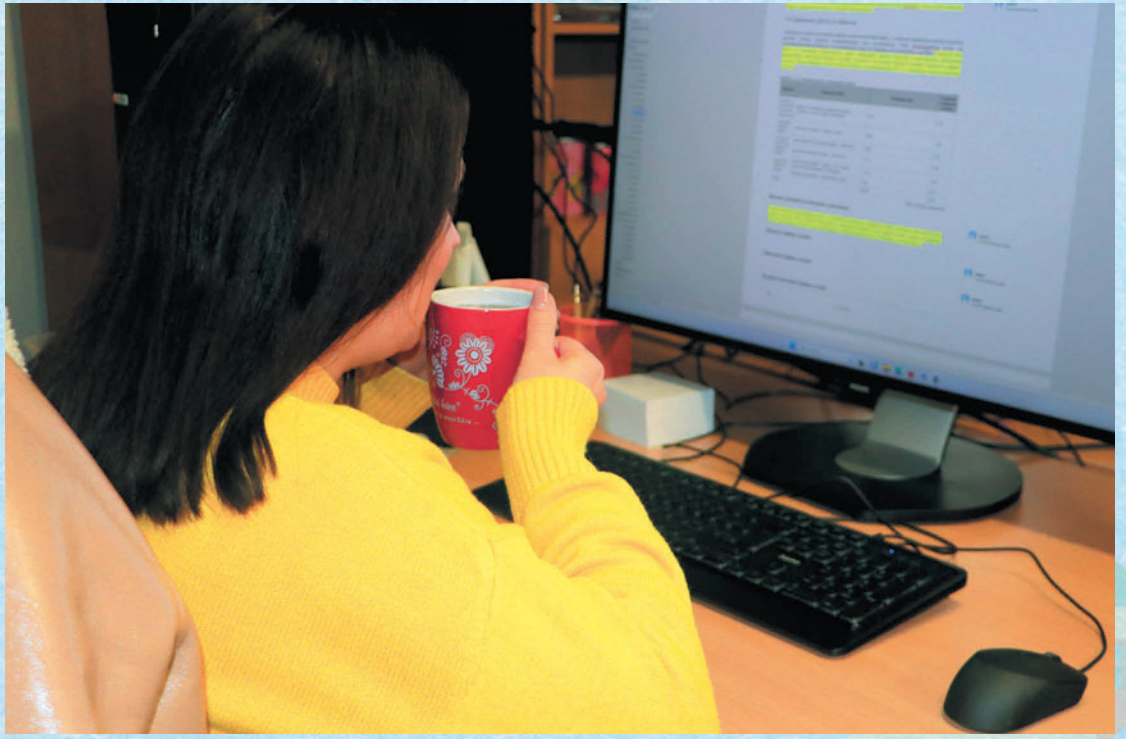
Insulate

We try to create a pleasant atmosphere in the offices. The requirements for warmth and comfort can be subjectively different for each colleague. Try to agree on common rules and stay COOL due to your energy-saving approach.

1. Reduce the temperature in the office, classroom or cabinet by 1°C.

2. Agree with your colleagues on a joint strategy for “Insulation”, i.e. warming up (shared hot drink, warm sweater, blanket, regular body movement).

3. Take a photo of your insulation method and, if you feel like it, write about your experience on www.ewobox.sk.



Ouch! It´s hot!

OBJECTIVES:

- Perceive the sun as a basic source of heat and light.
- Distinguish between the sensation of heat and cold and the heat sources in our immediate surroundings.
- Know how to stay warm even in winter.

THINK & FEEL

(Evocation)

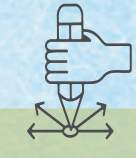
The sun also provides us with thermal energy, among other things. Show it to children with a simple activity. Prepare various materials such as stone, wood, water in glass, black rubber and more. Expose these materials to direct sunlight on a sunny day so that they retain as much solar heat as possible. Then have the children feel and describe the temperature of these materials. Tell them that the sun keeps them warm even in winter. Which material was the hottest?

KNOW & EXPLORE

(Awareness)

The children‘s task is to find (for example by touching) everything warm in the classroom. Give them red stickers to stick on objects and places with a heat source. Then walk around the classroom together and stop by everything they marked in red. Ask the children questions about heat at each spot, for example: Why is it warm? Where does the heat come from? Is it good that it‘s warm? At the end, find out if anyone has red-tagged themselves. Think together about why people have warm hands even in winter.

Then take a stroll through the hallways and rooms of the kindergarten, including the kitchen. Again, find out what‘s hot and talk about it. Your main research question will be: Why is it warm in the kindergarten and where does this heat come from? You can go from radiators to the source – find the boiler room, the heating plant, the boiler, the heat pump, etc.



ACT & CHANGE

(Reflection)

Prepare several pots or cups of yoghurt, soil and seeds (e.g. beans, peas or broad beans). Plant the seeds by placing half in a sunny spot behind the classroom window and the other half also in a sunny spot but in front of the window. Watch together what will happen. At the end of the experiment, think together why the seeds outside did not germinate even though they had as much light as the seeds inside. What were they missing? (*Heat*)

Give the children the **Insulation** worksheet (in Handouts). Their job will be to find the differences and figure out how we can stay warm better in the winter. Explain to the children the parallel between our clothing and the insulation of houses – we can also cloth (insulate) houses so that the heat does not escape as quickly.

Insulation

Spot the differences and find out why one boy is cold and the other is warm.

Where does the heat in the radiator come from?

OBJECTIVES:

- Be able to explain where the heat we use comes from.
- Save energy in everyday life.

THINK & FEEL

(Evocation)

Tell students that their research task will be to solve the puzzle: Where does the heat in the radiator come from? First, with the help of their parents, they try to find out how things work in their home – where does the heat come from, how it is created and how it gets to the radiators. Also ask them for a photo of the equipment that produces this heat (in case of apartments, this could be the local heating plant building).
The students record their findings about the generation and path of heat to the radiators and explain them to their classmates during class. Post the drawings and photos of the devices on the bulletin board and list all the sources from which heat is generated in their homes (*natural gas, logs, pellets, coal, solar energy, for heat pumps - air, earth, water*).

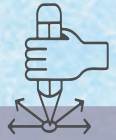
Then try to find out together where the heat in your school comes from. Ask the schoolkeeper for a trip to the school boiler room or visit the local heating plant that supplies heat to your school. Find out from what source this heat is generated and how it all happens.

KNOW & EXPLORE

(Awareness)

Before class begins, turn off the radiators in the classroom and open the windows wide so the room feels significantly cooler. Use the thermometer to observe how the temperature in the room changes over the course of the hour. You can use multiple thermometers at the same time and track the temperature at different heights above the ground. Students record their measurements in the **Temperature Behaviour** (in Handouts).

You can repeat the measurement several times a month, always in different conditions (colder/warmer weather, radiator off/on, blinds closed/open, morning/noon) and compare the results. Use the activity to explain the physical properties of heat to students and prompt them to formulate research questions.

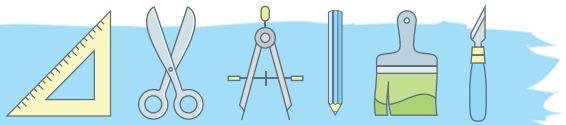


ACT & CHANGE

(Reflection)

Since students already know how heat is created, it's time for a question: Why should heat be saved? Find out the student's opinions and then agree together on the principles for saving heat in your classroom. Draw simple pictograms for individual policies and short slogans or verses to make them easier to remember. For inspiration, use some advice and tips on the We Save for Us project pages.

Create a simple game to observe and review what you have learned about heat and how it occurs. Place pictures of devices that produce heat (that the children brought in as part of the Think & Feel activity) on the floor and place around them cards with the names of the sources that produce heat in their homes. The children sit around and you take turns pointing at different devices with a longer stick. The children's task is to react as quickly as possible and touch the card of the correct source that generates heat in the respective device. Whoever grabs the wrong card is eliminated from the round.



Temperature behaviour

Record the air temperature in the classroom at different heights above the ground. Set different conditions for each new measurement. Find out how the heat "behaves" in the room.

Measurement number	Measurement time	Measurement conditions	Temperature			Measurement number	Measurement time	Measurement conditions	Temperature		
			On the ground	1 m above the ground	2 m above the ground				On the ground	1 m above the ground	2 m above the ground
1.						11.					
2.						12.					
3.						13.					
4.						14.					
5.						15.					
6.						16.					
7.						17.					
8.						18.					
9.						19.					
10.						20.					

What did you find out? What can be derived from your measurements?

Heat at school

OBJECTIVES:

- Know the energy requirements of buildings.
- Identify measures to reduce the energy consumption of buildings.

Middle school

THINK & FEEL

(Evocation)

Start by asking students a research question: Which room in the school is the warmest and which one is the coldest? Formulate your hypothesis.

Then divide the students into groups and give each a room thermometer. Select stations on school grounds where groups should stop and take air temperatures. It can be a schoolroom, a classroom, a hallway, a toilet, a teachers' lounge, a gymnasium, a school kitchen, etc. They record their measurements and compare the results when they return to class. Was your hypothesis confirmed? Which rooms in the school are overheated and which are overcooled?

KNOW & EXPLORE

(Awareness)

Ask the students to explain why different areas of the school have different temperatures and mark their statements. Then dig deeper and check your assumptions. Provide each group of students with a measuring device, a non-contact thermometer for measuring the temperature of surfaces (or a thermal imaging camera, or a cell phone with a thermal imaging camera) and the **Tracking the Heat** worksheet for recording data (you can find a sample in the Handouts).

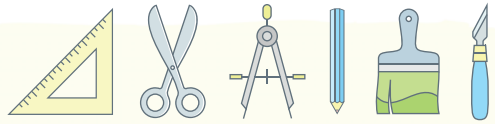
Their task is to go through all the designated areas of the school again and find out what factors affect the air temperature. For example, in each room, they will record: the volume of the room (floor plan x height), the number of windows and their condition (age, material, seal damage), the number of doors and their condition, the floor on which they are located, the location of the room, orientation of the room to the cardinal points, condition of the radiators (overlap, equipment with thermoregulation heads, adjustment of the temperature level), heat leaks using a thermometer (cooler places on the walls, around door frames).

ACT & CHANGE

(Reflection)

Each group presents their results and evaluates whether their original assumptions have been confirmed. You will then work together to identify rooms where overheating or heat leaks are occurring and suggest solutions. Give the students the **10 Tips** worksheet to identify additional actions to add to their designs.

Divide the tasks and prepare a presentation to the school management about your findings and suggestions (PowerPoint, recordings and measurements, posters, information resources, etc.).



Tracking the Heat

Document the temperature in individual rooms and areas of the school. Then explore the factors that influence it.

Room	Air temperature	Volume	Floor	Orientation	Windows	Doors	Radiators	Heat leak
schoolroom								
hallway								
classroom								
teachers' lounge								
gymnasium								
kitchen								
dining room								
toilet								

Explanations:

Volume – floor plan of the room x height, in m^3
Floor – ground floor, attic, etc.
Orientation – position in relation to the cardinal points
Windows – number, age, material, seal damage
Doors – number, age, material, seal damage
Radiators – number, overlap, equipped with thermoregulation heads, adjustment of the temperature level on the heads or the thermostat
Heat leaks – the temperature of the walls around windows and doors or in the corners of the room.

10 Tips

Match the pictograms with their description and find out what measures you can take at school and at home to save heat.

DON´T OVERHEAT THE ROOMS

ADJUST THERMOREGULATION HEADS CORRECTLY

WATCH AIR MOISTURE IN THE ROOMS

DON´T OVERLAP THE RADIATORS

DON´T TURN OFF THE HEATING IN WINTER ENTIRELY

DON´T FORGET TO VENT THE RADIATORS

AIR THE ROOMS SHORTLY BUT INTENSIVELY

LET THE SUN ENTER EVEN IN WINTER

CHECK THE SETTING OF WINDOWS

CUT THE CONSUMPTION FIRST THEN USE RENEWABLE ENERGY SOURCES

Source: taken from the 10 Tips for Saving Heating poster

Energy Audit

OBJECTIVES:

- Distinguish the effectiveness of specific measures to mitigate climate change.
- Work on school projects to mitigate climate change.

High school

THINK & FEEL

(Evocation)

Have the students develop a mind map related to the topic: The energy in the school building, where they highlight everything related to this **topic**. You can use the **Several Tips** quiz from the Handouts to introduce the topic or create your own quiz based on specific data you find out about energy use in your school.

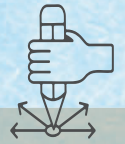
Form a working group of students from different grades – an energy team whose task will be to carry out an energy audit, suggest measures and implement the energy code into everyday school life.

KNOW & EXPLORE

(Awareness)

First, ensure the energy team has sufficient information. Conduct a training session where you invite experts. You can contact the Slovak Innovation and Energy Agency (SIEA), which offers free energy advice, or a company in your area that carries out energy audits and building certifications (the trainer can also be present online). In class or a physics club, study the quantities, properties and measurements of consumption of different types of energy.

Together with the energy team, prepare and carry out the **School Energy Audit** yourself or in collaboration with an expert, economist or schoolkeeper (a sample form can be found in the Handouts). Follow these steps: 1. Identify all locations in the school buildings that have an impact on energy consumption. 2. Try to find out the actual energy consumption and also the CO_2 footprint (CO_2 in kg per kWh of energy consumed - electricity or heat). Ask the economist to provide invoices from suppliers for heat, hot water and electricity. Use an electricity consumption meter to uncover energy eaters and their carbon footprint. Together with the schoolkeeper, take a tour of the boiler room, heating or hot water production system, electricity consumption meters, water, heating source, etc. 3. Study the Energy Saving Manual published by the Ministry of Education, Culture, Sports and Science of the Slovak Republic with recommendations for saving energy at school, divided into three categories (organizational, technical-operational and investment). 4. Select measures from each category and examine them in terms of energy savings, carbon footprint, time and financial complexity of the investment, etc. 5. Suggest measures that will improve the efficiency of the building – reduce energy consumption and also the school's costs and help mitigate climate change.



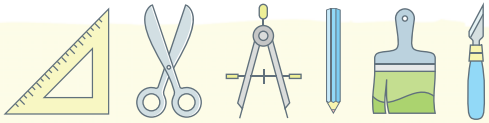
ACT & CHANGE

(Reflection)

Use the outputs of the work of the school energy team and develop other student competencies. Prepare documents together with the team and present the audit results to the school management and the school board.

Create an Energy Code for your school – principles of consumer behaviour for users and visitors to the school building in relation to energy. The creativity of an individual talented students is encouraged. The Code can be in the form of posters, leaflets, videos, advertisement, room installations or signs in places where consumer decisions are made (e.g. sinks, radiators, windows, switches, sockets, certain electrical appliances, etc.). Educate all students and teachers.

Ensure the continuity of the energy team work in the coming years. Use peer learning to pass on the team's experience to other students of the school.



Several Tips

Fill in the missing parts of the sentence and find out how you can reduce energy consumption and mitigate climate change when running a school.

By reducing the temperature inside the school by every degree, you can save up to... % of heating costs.

a) 2
b) 4
c) 6

The production of compact and circular fluorescent lamps was completed in 2023 in accordance with Directive 2011/65/EU of the European Parliament and of the Council on the restriction of the use of certain hazardous substances. It is a unique opportunity to equip buildings with modern and economical lighting with the possibility of regulation (automatic switching off and dimming). In schools, savings through lighting regulation can amount to ..... %.

In comparison to a conventional roof covering, the area under the green roof in summer is..... °C cooler in the summer, which can significantly improve the comfort of the users of the school building, reduce the need for cooling and the carbon footprint of the school.

a) 1 b) 2 c) 3

When you leave the school, it is advisable to adjust the thermoregulation head on the radiators to the ... level. The classrooms will be 16 to 18°C and will warm up easily when you return.

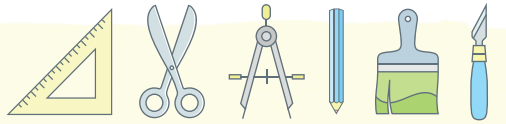
a) 1
b) 2
c) 3

Daylight is free and also has no CO_2 emissions. Adjust blinds to limit direct sunlight while letting in plenty of day light. In winter, pull them ..... .

a) halfway up the window
b) up to three quarters of the window
c) all the way up

Check your answers in these sources:

10 TIPS for employees HOW TO REDUCE ENERGY CONSUMPTION AT THE WORKPLACE
https://setrimeprenas.sk/wp-content/uploads/2023/03/Letak_18_rad_pre_manazerov_ako_znizit_spotrebu_energie_setrimeprenas.pdf
The production of fluorescent lamps is done. How can you replace them?



School Energy Audit

Conduct a school energy audit. Divide into smaller teams as each examines a different **school area – A.** schoolrooms, classrooms and cabinets, **B.** occasionally used areas (corridors, locker rooms, showers, storage), **C.** purposefully used areas (gymnasium, kitchen, dining room).

Proceed consistently: 1. Try to find out the most accurate data on energy consumption in the specific area of the school; **2.** Evaluate the specific recommendations of the Ministry of Education in terms of energy savings, carbon footprint and difficulty of investment; **3.** Interpret what measures are suitable for your school and suggest their implementation.

	1. Energy consumption and carbon footprint	2. Recommendations of the Ministry of Education			3. Draft measures
		Organizational	Technical and operational	Investment	
Electrical appliances					
Faucets					
Shower heads					
Toilets					
Lighting					
Radiators and other heating elements					
Electric heaters					
Air conditioning (cooling)					
Windows					
Doors					
Enclosure walls					
Roof					
Heating system					
Water draw-off or water heating					
Supply or production of electricity					

MAREC

I DON‘T SHOP TO FEED THE BIN

I don‘t shop to feed the bin

You need to know

In shops and supermarkets, you often see people pushing overfilled shopping baskets. They take their “catch” home and enjoy it for a while. But in a few days or weeks, some things will go wrong, or we get tired of them. We use up some of them literally in a few seconds or minutes, so they go straight from the shopping basket to the bin. This movement of goods from basket to bin occurs practically every day.

Waste is as old as humanity itself. However, its character has changed fundamentally. In a few centuries, archaeologists will be digging up the unsightly contents of our current landfills instead of monuments.

According to the Statistics Office, in 2022 Slovakia created 2.6 million tons of municipal waste (MW). That’s an average of 478 kg per person, which equates to around 1.3 kg of waste per day. The recycling rate was 49,5 %. 39,3 % of waste still ends up in municipal landfills and the remaining 10 % in incineration plants.

It’s not waste that ends up in the trash, but valuable raw materials from which things are made (wood, oil, bauxite, iron ore and others).

In the figurative sense of the word, all the energy used in the extraction of raw materials, production and transport of products also ends up in the trash. For example, the production of 1 kg of aluminium consumes 47.5 kWh of electricity, which is 23 times more than the production of glass.

We also throw away water that is used in the cultivation of basic raw materials, in production or transportation. The water footprint (i.e. the water used to produce a particular product or perform a service) of a cotton T-shirt is 2,700 litres of water. Almost 16,000 litres of water are used to produce 1 kilogram of beef.

Are we so rich that we can afford to throw away all these valuable raw materials? Not to mention, landfills are a major producer of the greenhouse gas methane (CH4), which has a global warming effect more than 80 times greater than its better-known counterpart carbon dioxide (CO2) in the first 20 years after it is released into the atmosphere.

The solution to the waste problem lies in the hands of different groups of people. The task of politicians is to adopt stricter standards and laws to ensure a higher proportion of waste recycling or to ban the use of certain (mainly disposable) products.

The task for manufacturers is to move to a circular economy, a model of production and consumption in which things are not thrown away, but rather shared, borrowed, reused, repaired and recycled as much as possible. This increases the lifespan of the products and reduces waste.

However, it is also in our own hands – the consumers. Manufacturers make what people buy. If we start rejecting single-use products, non-ecological packaging or inferior products, we will indirectly force manufacturers to change their production models.

There are packaging-free shops, local markets, flea markets, dispensaries, and products with certified eco-labels that guarantee health and ecological harmlessness, but also fair trade. Literally at every turn these days we also come across the concept of zero waste, a lifestyle that aims to reduce waste production.

Solutions are all around us. They are in nature, in our minds and hearts. We just need to reach and want to... Want to change something for our present and future.

More on this topic

Ekorestart (online magazine) – article about the carbon footprint of various cities in Slovakia

Zero Waste Slovakia – practical tips for a zero waste lifestyle

Inštitute for Cicular Economy – overview of circular maps of various cities in Slovakia

Can I understand logos and symbols? – a guide to eco-labels for different types of products.

Let's go!

2030 Climate Target

Increased support for the circular economy through waste prevention (Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050)

What's the hold-up?

I shop, therefore I am. We all buy according to certain preferences – in terms of price, habit, practicality, time, etc. However, we often forget the ecological aspect. We don't realize that shopping is a major contributor to climate change, and as consumers, we have enormous power in it. If we don't buy something, manufacturers will stop producing it or change their ways. So our strength also lies in what we put in our shopping cart.

THE CHALLENGE

Choose a strategy

How and what we buy has a huge impact on our planet. But we can also shop ecologically, responsibly and economically. You just need to pay attention to the product counters, examine the alternatives and choose carefully. Sometimes it takes more time or leaving our comfort zone. But the options are there.

1. During the challenge, focus on one of the following shopping strategies:
    - **Shop packaging-free** – in packaging-free stores or in regular stores with your own containers and bags.
    - **Prefer products with certified eco-labels** – e.g. European Flower, Eurolist, Fairtrade, Ecocert, Environmentally friendly product and others.
    - **Buy from local producers** – in your immediate area, give preference to Slovak products.
    - **Don't buy new things** – trade, donate, lend.
2. Go beyond your comfort zone, be careful about what you buy and be consistent.
3. Share your experience about your strategy on www.ewobox.

Envirospektrum, Roman Jedinák, Alexandra Mária Stránska

In a store

Objectives:

- Understand how shopping contributes to waste.
- Know ways to avoid waste when shopping.

Kindergarten

THINK & FEEL

(Evocation)

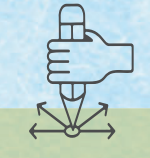
Play a short skit for the children about Philip, who came into the store very hungry and thirsty. Without thinking, he bought a lot of things – cookies in a plastic bag, a box of juice, apples in a plastic bag, pudding in a plastic cup, a croissant in a plastic bag and also a plastic bag to carry his purchases. Use real products, a shopping cart or basket, and a plastic bag as props. Ask the children what happens if Philip eats and drinks everything. How can it be that food and drink suddenly become waste?

KNOW & EXPLORE

(Awareness)

Throw all rubbish from the shopping in one heap. Ask the children if they know what happens to them next and where they go from the rubbish containers. Talk about what a landfill is and what we can do to prevent our trash from ending up there. Then sort the rubbish correctly into coloured containers together with the children. You can also play rubbish collectors and drive the garbage to the right container with a toy car.

Continue the story and tell them that Philip is smart and knows how not to produce trash at all. Let kids colour in a picture of **Home-made eggs** (in Handouts) and explain waste reduction based on the principle of buying eggs in plastic packaging, recycled cardboard packaging or, best of all, individual eggs without any packaging. Bring samples of such packaging to the demonstration.



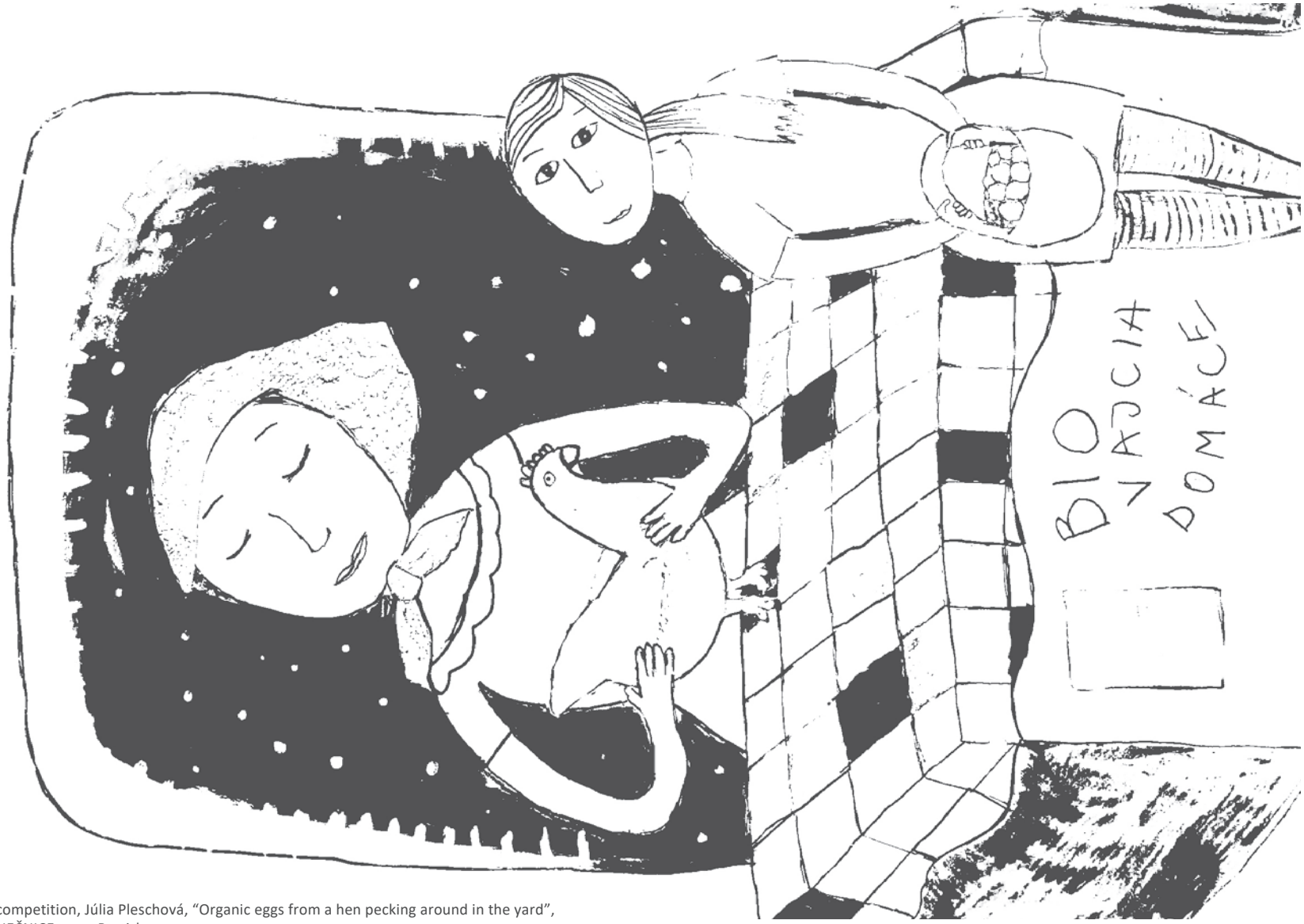
ACT & CHANGE

(Reflection)

Play package-free shopping with the children. Set up shelves with various goods in bowls (fruit, pasta, sugar, dried fruit, cereal, spices, rice, etc.), scoops and various reusable containers, bags and shopping bags to carry your purchases. At the beginning of the activity, you can also practice the rules of polite behaviour in the store. The children's task is to try out their own package-free shopping.

Finally, have the children complete the **Shopping** worksheet and talk about when shopping creates less waste and when it produces more waste. Finish the story about Philip together and point out to the children that when we go shopping, we need to make sure that our purchases produce as little waste as possible.

Home-made eggs



Green World competition, Júlia Pleschová, “Organic eggs from a hen pecking around in the yard”, 13 y.o., art SLNEČNICE, o. z., Bratislava

Shopping

Connect pictures of things that produce less or no waste with a cheerful shopping cart.
You associate things that create more waste with a sad shopping cart.

Waste of the future

Objectives:
- Understand the impact of your own activities and decisions on the environment.
- Know waste-free alternatives to common products

Elementary school

THINK & FEEL

(Evocation)

Sit with the children in a circle with a large pile of trash in the middle to represent the landfill. As waste, you can use, for example, plastic biscuit packaging, a can, an aluminium can, a piece of cloth, a magazine, a plastic bottle, a glass cup, a piece of dry bread, a broken plastic toy, a tetra pack juice box. You can specifically select items that students use frequently and throw away. Ask them what it is and what it was before they threw it away.

Each child takes a piece of trash and their job is to say what it is made of. Guide them with questions so that they gradually realize that all things around us are made of basic natural raw materials (plastic - oil, paper - wood, fabric - cotton, glass - quartz sand, canned goods - iron, aluminum foil - aluminium / Bauxite, food – fruits, vegetables, grains, farm animals). At the same time, ask whether energy and water were used in the production of these items.

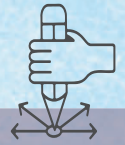
One by one, the children throw their waste back into the heap (landfill) and you symbolically throw the natural resources and raw materials from which it was made into the prepared basket (branches - symbolizing wood, stones - iron ore/bauxite, sand - silicates for glass making, brown papers – coal and oil, cotton balls – cotton). At the same time, throw a battery into the basket with each trash as a symbol of the energy used. In small doses pour some water into the prepared container, symbolizing its consumption and also pollution during the mining and production of things.

KNOW & EXPLORE

(Awareness)

Throw everything from the basket can into your "landfill" and add a container of water. Ask students: What did we actually throw away with the trash? (natural resources, water, energy) Start blowing soap bubbles over the landfill. What could that symbolize? Explain to students that various gases are released into the air from landfills. One of them (methane) is warming our planet and causing global warming.

Find out how would students solve the waste problem themselves. Tell them to close their eyes for a moment and imagine what that future might look like as you read them the **A Future Without Waste** story (in Handouts). After the story ends, ring the bell and ask students to open their eyes and return to the present.



ACT & CHANGE

(Reflection)

Talk about their impressions of a future without waste. How did they feel? Is it possible to live without waste today? Prepare a sample of various zero-waste products (loofah, cloth makeup remover tampons, cloth hanky, stainless steel straw, beeswax napkin, solid shampoo, and more). Discover them together and find out what they are for. Emphasize that there are still many alternatives to traditional products that do not generate waste.

Have students complete the **Waste of the Future** worksheet. Rate it and discuss with them which of these products would they recommend to their parents to use at home.

Future without waste

Close your eyes and take three deep breaths in and out. What does the Earth currently look like in terms of waste? Imagine sorting trash at home and throwing it into bins for separate collection. The sorted waste is taken to various processing plants where it is used to make new bottles, glass cups, paper and aluminium cans. You throw the remaining waste into municipal waste containers, which are taken away by a rubbish truck and this waste ends up in a landfill. You are in a landfill. There is a lot of rubbish. You hear the sound of large bulldozers tearing it apart. You can smell the decaying material. You see crows flying overhead, swooping down on the trash and rummaging through it. How do you feel about this place?

Imagine going to bed after returning from the landfill. You cover yourself with the blanket, close your eyes and fall asleep. At night you will be miraculously transported to the future. It is the year 2323. What does it look like there? What do houses, cars, food, and people look like?

In the year 2323, there will be no more landfills and waste. All things like electronics, cars, toys and furniture are designed to last and can be easily repaired. TVs, cell phones, refrigerators and washing machines have a built-in automatic update that reprograms them to a newer version every 2 years. All people shop at local farmers' markets or grow their own fruits and vegetables. There are only packaging-free shops where everyone shops bringing their own containers. If something needs to be packaged, it is made from plants and can be composted.

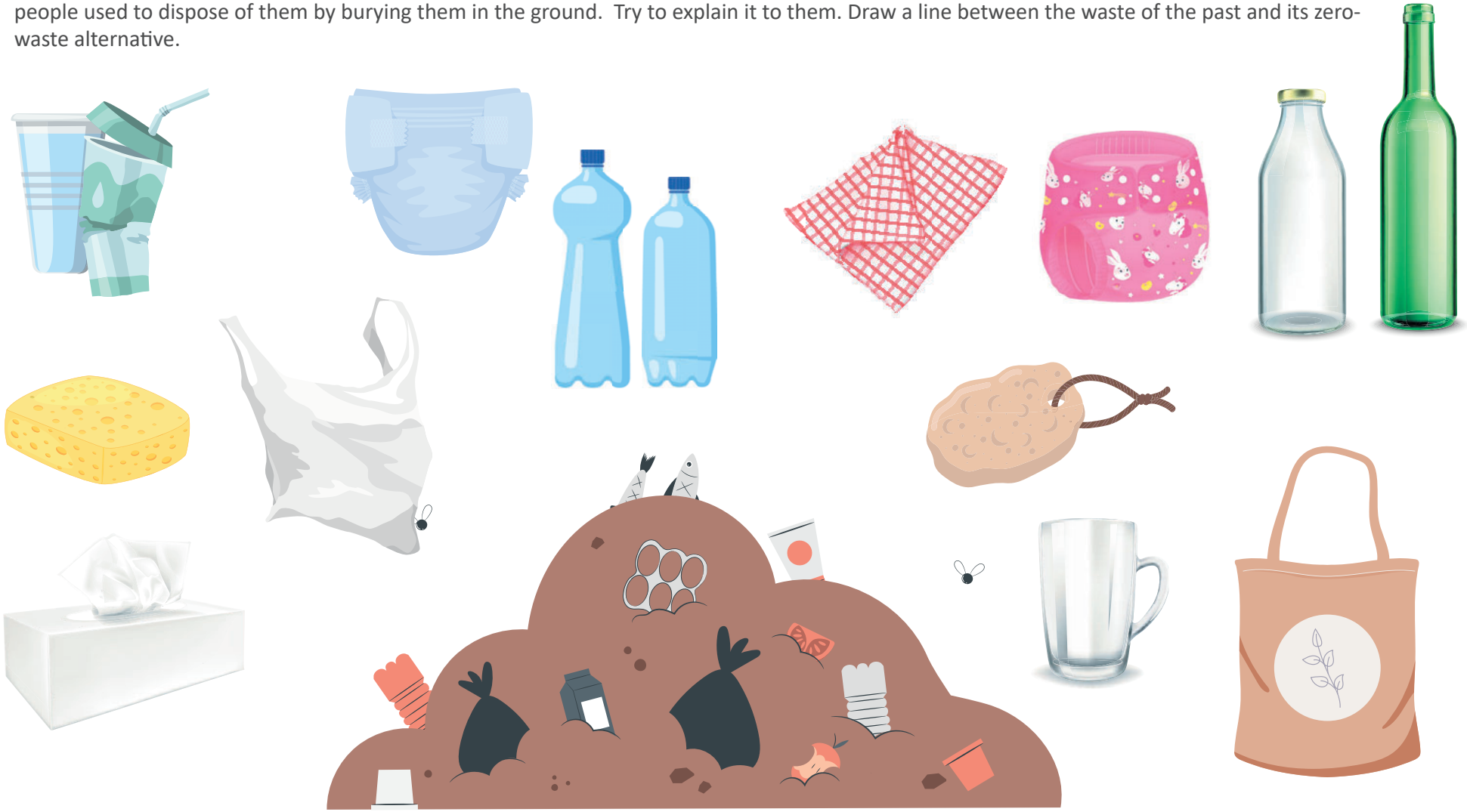
There is clean air, water, greenery, parks and playgrounds everywhere. There is no need for landfills, garbage trucks, incinerators, large factories...

How do you like this idea? Is it nice? Would you like to live in a world like this?

Something of this zero-waste world of the future already exists now. When I ring the bell, wake up from this fantasy and return to the present.

Waste of the future

The year is 2323. Archaeologists came across a strange-looking man-made hill. They discovered many buried objects inside and have no idea why people used to dispose of them by burying them in the ground. Try to explain it to them. Draw a line between the waste of the past and its zero-waste alternative.



Waste of the future

Instead of trash, leave ideas and tips for future people to solve this problem. Imagine making what is called a time capsule with the best we currently have and know. Draw or write which products will go into the capsule and be used in the future.

I shop, therefore I am

Objectives:

- Be aware of the impact your purchase has on the climate and the environment.
- Acquire the ability to take commitment and responsibility for your consumer behaviour.

THINK & FEEL

(Evocation)

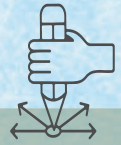
Have the students complete the **Balloon Flight** worksheet and evaluate it together. What did they realize during the balloon ride? What things did they throw away first? Which ones are the most necessary for them and the rest in the balloon? Do the students see parallels between shopping and throwing things out of a balloon? Do we only buy what we really need?

KNOW & EXPLORE

(Awareness)

As homework, assign the students to develop a project following these instructions: Divide the students into five groups and give each a shopping strategy from the **Pizza Strategy** worksheet (in Handouts). The task of each group is to purchase the ingredients for the pizza listed in the **Pizza Shopping** worksheet according to the assigned strategy. They don't have to buy the ingredients, they can take a photo of them (including the price) and use the photos to create a presentation.

In the next lesson, each group present their purchase (ingredients, price, packaging waste). The task of the others is to guess which purchasing strategy they followed, and according to which criteria they made their decision (price, ecological and health aspects, habit, popularity, image, etc.). You can write these criteria on the board. Discuss with students about different shopping habits and what influences us in stores. (social prestige, advertising, discounts and special promotions) Which shopping behaviour generated the least waste? What does shopping have to do with climate change? How can we influence and change it ourselves?



ACT & CHANGE

(Reflection)

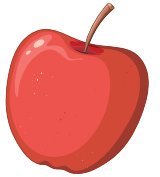
Distribute the **Waste Pyramid** worksheet to students. What forms the base of the pyramid and what is at the top?

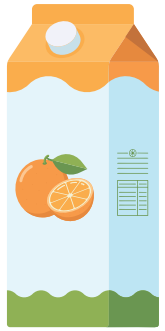
Cut the **Zero Waste Pyramid** worksheet into individual elements. Introduce the students to the hierarchy of the zero waste. Choose five students and give them each a part of the pyramid (Reject, Reduce, Reuse, Recycle, Rot). Distribute shortened statements about our consumer behaviour to others. The task is to correctly assign the statements to the individual parts of the pyramid.

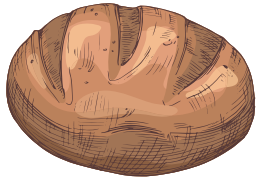
Talk about the so-called **Pyramid of Willingness** (in Handouts). What are the students willing to change in their lives in connection with waste reduction, and what, on the contrary, are they not?

Balloon Flight

Imagine you are flying in a balloon. Your burden is very heavy and you have to gradually throw away the things you don‘t need. What three things are left there with you? Which ones can you surrender to? Underneath the balloon, write the order in which you threw it away.







1.	2.	3.	4.	5.	6.	7.
8.	9.	10.	11.	12.	13.	14.

Pizza Strategy

Pizza activist

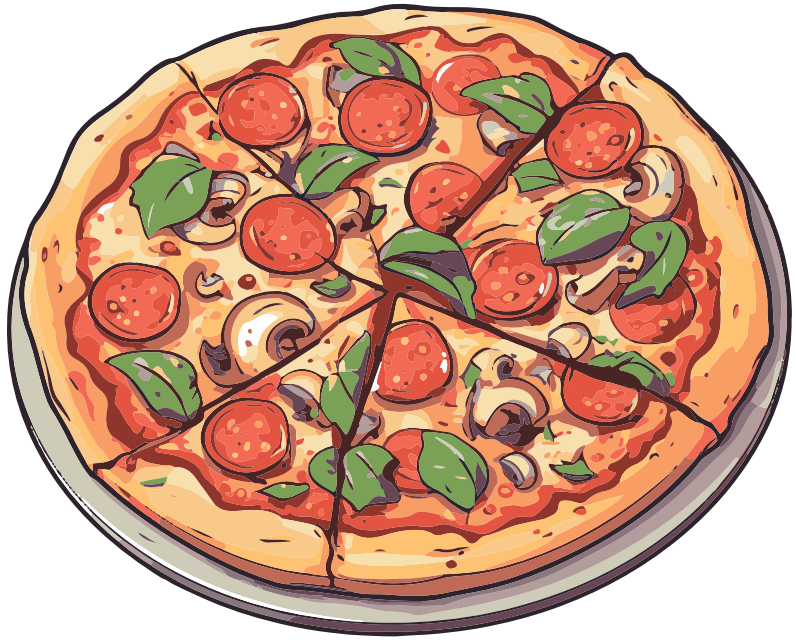
For him, the planet and a sustainable lifestyle come first. He doesn‘t mind paying a higher amount for such products. He buys products with a lower ecological footprint (local products, preferably without packaging). He prefers certified organic brands. He enjoys visiting local markets, packaging-free shops and smaller local shops. He constantly educates himself, carefully considers purchases, studies labels and thinks about the impact of products on the environment.

Pizza Miser

When shopping, price comes first. He likes promotions and flyers and often visits several stores for a good price. He only buys things that he really needs and doesn‘t want to pay extra for anything. He always goes to the store with a list of things, he carries his own bag (so he doesn‘t have to pay for a new one). He doesn‘t care what brand he buys or what the product‘s composition is.

Pizza Regular Guy

For him, habit comes first. He only buys things that he knows and is used to. If the product is cheaper (sale, discount), he will be happy, but the price is not important to him. He doesn‘t like to experiment or try new things. He usually goes to the same store where he knows the goods, the premises and the salespeople.



Pizza Expert

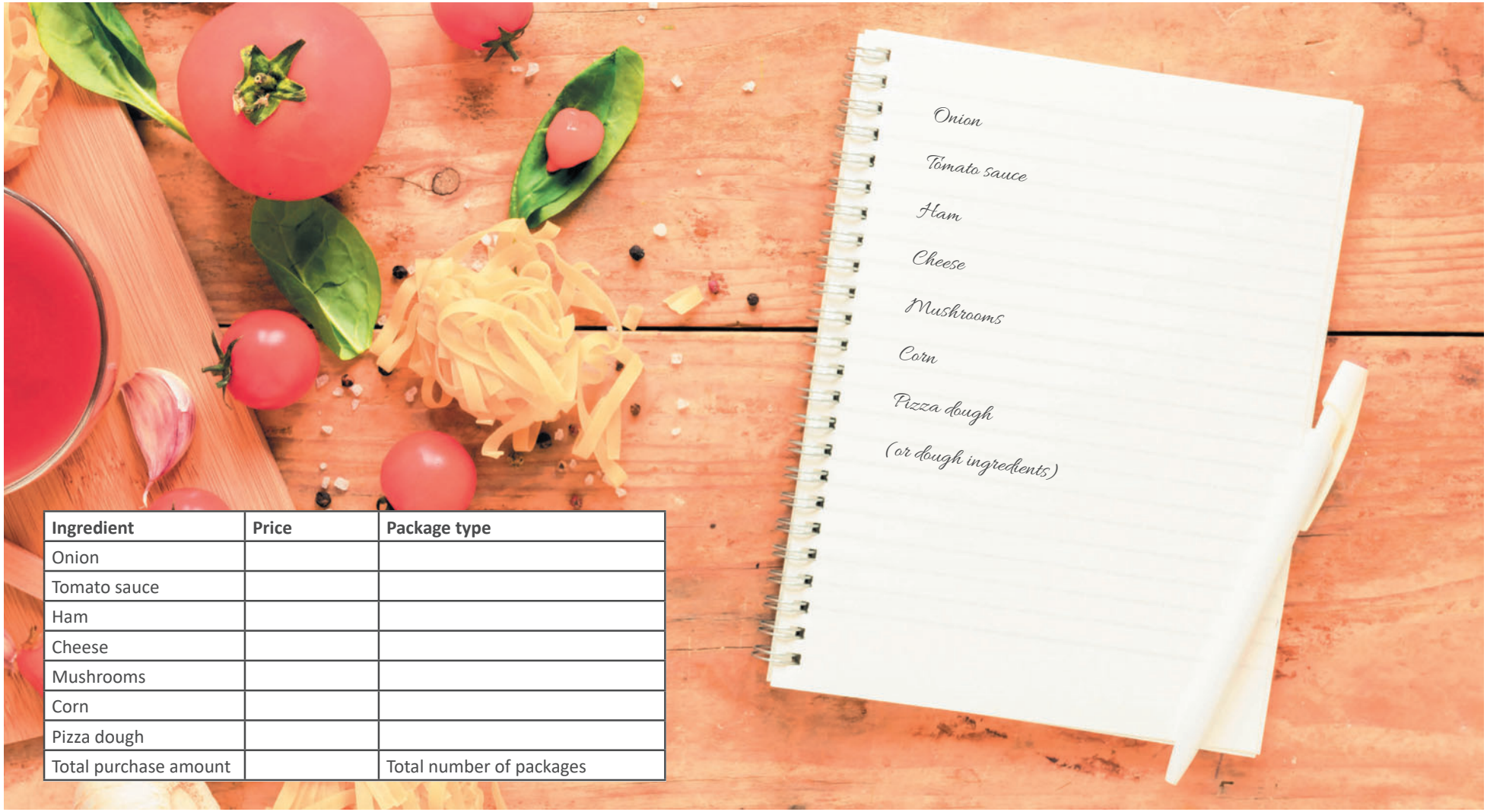
His first priority is his health, his family and his loved ones. He studies product labels carefully. He buys healthy, organic food for which he is willing to pay an extra. He is often influenced by food trends and likes to try new things. He enjoys sharing his knowledge about healthy diet with others.

Pizza Influencer

His reputation and image come first. He buys things that are “in” and enjoys sharing his experiences on social media. He doesn‘t care about price or quality. He is easily influenced and will buy anything that another influencer or celebrity recommends. He will also be happy to advocate for nature conservation or the fight against climate change if that brings him more popularity.

Pizza Shopping

Buy ingredients for your pizza. Stick to your chosen purchasing strategy.

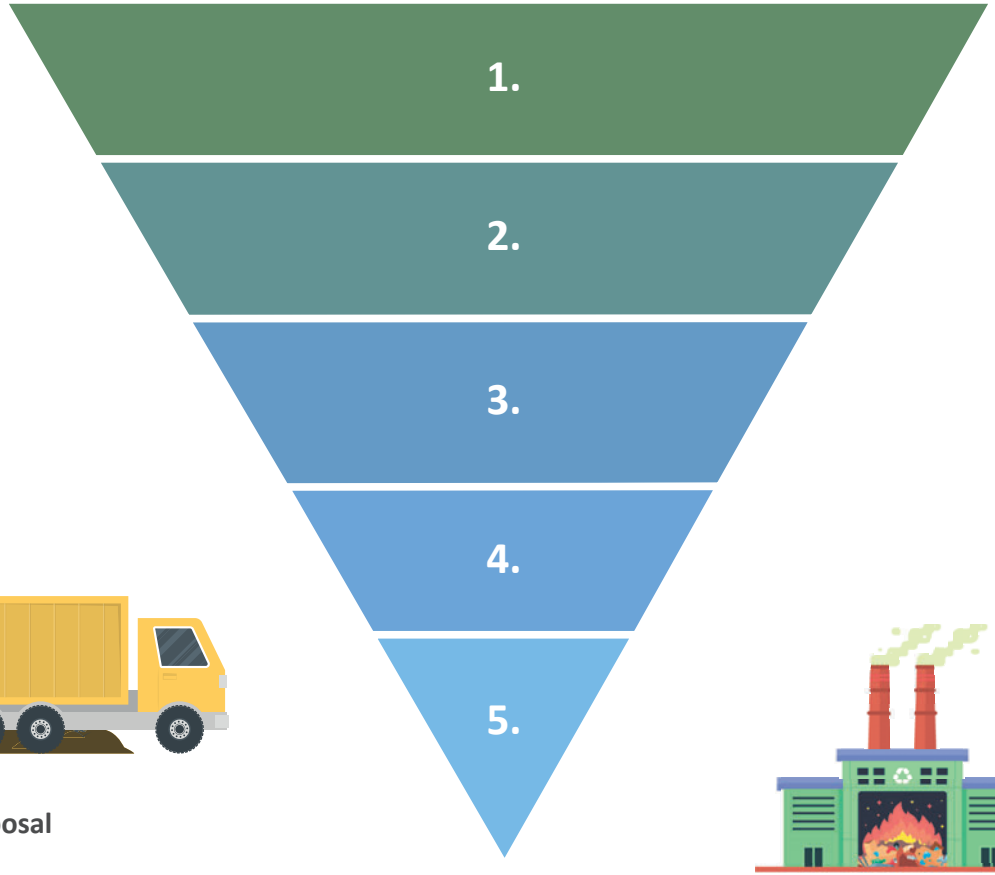


Ingredient	Price	Package type
Onion		
Tomato sauce		
Ham		
Cheese		
Mushrooms		
Corn		
Pizza dough		
Total purchase amount		Total number of packages

Waste pyramid

Correct separation and recycling are the basis for solving the waste problem! **Is that true?** Is recycling our only salvation and choice? Also known as the “waste hierarchy pyramid” rank them correctly from the best option (1) to the least suitable (5). Write specific examples for each element.

set up for reusing

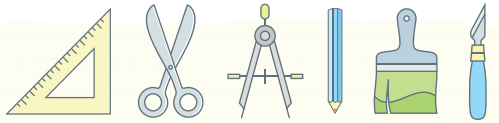


waste prevention

recycling

waste disposal

waste-to-Energy



Zero waste pyramid

Pyramid parts:

REDUCE

RECYCLE

REFUSE

REUSE

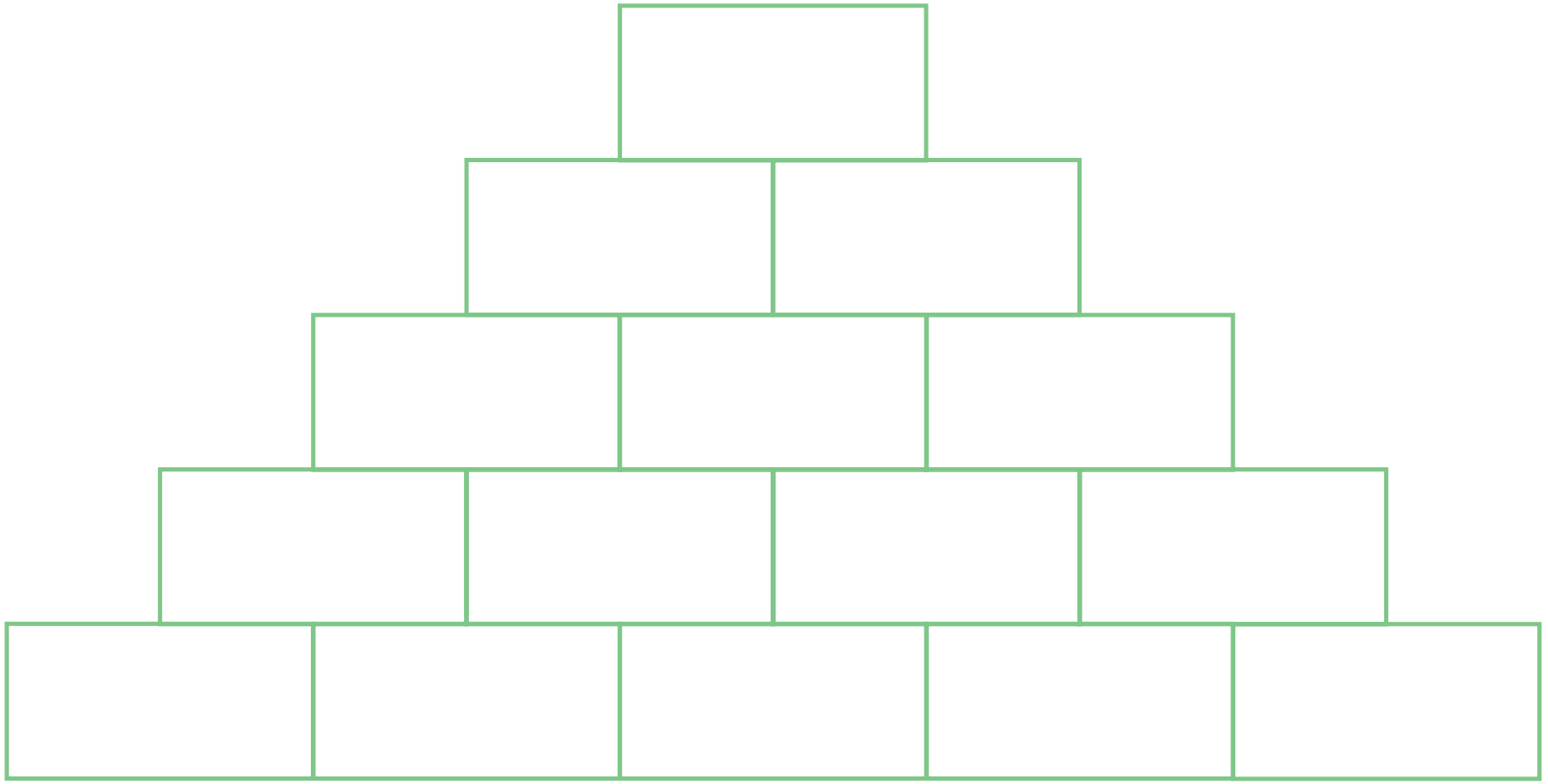
ROT

Statements about our consumer behaviour:

I have an inscription on the mailbox: Do not throw in any advertising.	I don‘t buy what I don‘t need. I refuse (e.g. free samples, promotional items, disposable products).	I will refuse a straw for my drink in a restaurant.
I carry my own bag to the store.	I prefer to buy one large package (e.g. toilet paper) rather than several smaller packages.	I only buy what I can eat.
I go shopping with a list and only buy things that are on the list.	Coffee grounds can be used as garden fertilizer.	I‘m going to make a rag out of a tattered T-shirt.
I will also use the intact Christmas paper to wrap gifts next year.	I donate the clothes I don‘t need.	I will sew up holes in my clothes.
Instead of buying a new phone, I just replaced the battery.	Recycling can save energy equivalent to three hours of television.	When 1 million glass bottles and jars are returned to the glass factory, up to 300 tons of glass sand, 1,000 tons of soda, 60 tons of heating oil, 0.76 million m^3 of natural gas and a lot of electricity are saved in new glass production.
Two litre beverage cartons can produce a one-square-meter of paper towel.	Boards for a one family house are made from 3,000 beverage cartons.	The purpose of composting is to break down biological substances in waste and convert them into humus substances that are useful for plants. I created a vermicompost (composting with earthworms) in my apartment.

Pyramid of Willingness

In this pyramid, sort the waste prevention measures you are most willing to take (upper levels) and least willing to take (lower levels).



Zdroj aktivity: Jan Vrtiška, Změna klimatu a já, www.ucimoklimatu.cz

Future without packaging

Objectives:

- Ability to apply purchasing and waste measures that mitigate climate change.
- Distinguish the effectiveness of specific waste reduction measures concerning climate change.
- Create your lifestyle with a low carbon footprint.

THINK & FEEL

(Evocation)

Find out what greenhouse gases students know (methane, water vapour, nitrous oxide, carbon dioxide). Divide the students into four groups. Each will have the task of creating a greenhouse gas model, e.g. from skewers, pasta, straws, and Play-Doh. The groups will present their creations to others.

What activities produce these gases in connection with waste? Show the students the **Chart** sheet from the Handouts. What conclusions can you draw from this? Why are greenhouse gas emissions from waste decreasing in the EU but not here? (The predominant method of waste disposal in Slovakia is still landfilling.) Which activity causes the most emissions? (landfill)

KNOW & EXPLORE

(Awareness)

Have the students briefly brainstorm the question: What is the solution to the waste problem? Then play **Speed dating in the future** focused on various initiatives and alternative solutions to this problem (from the activity of OZ Na Zemi, Czech Republic). You can do the following...

Each student selects only one of the prepared texts in the Handouts and reads it. Then divide the students into pairs. Together they tell each other the main idea and content of the text. Their task is not to read the text, but to retell it in their own words and explain the advantages or disadvantages of each initiative. After the presentation, the students exchange texts and find a new pair. In the next round, everyone presents a new initiative. Repeat the process depending on how much time you have available.

At the end, answer the questions together with the students: Which alternatives and initiatives have you already known or tried out yourself? Which of these caught your attention and would you like to implement them? Which ones were controversial? Were the suggestions from our brainstorming also included? The students can divide texts into different categories (e.g. personal level, community activities, systemic change) and discuss them.

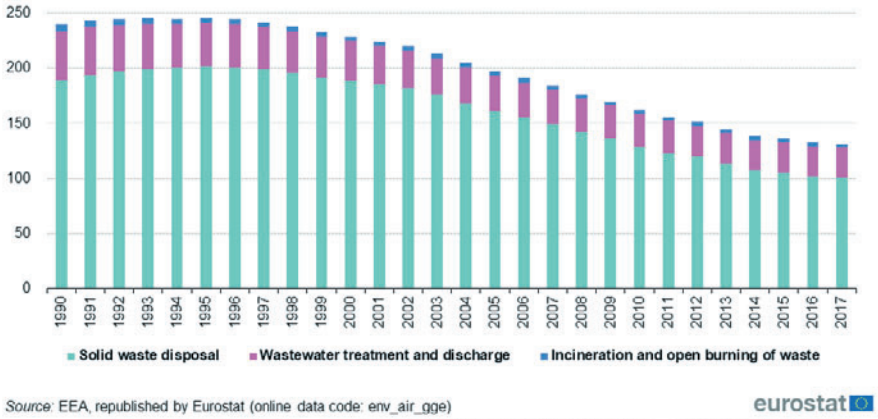
ACT & CHANGE

(Reflection)

Introduce the students to the concept of the circular map. Find out whether your city has such a map. If so, ask the students to visit the selected locations on the map and report about them to their classmates. If not, have them develop their own design of a circular map of the city, village, or neighbourhood where they live.

Charts

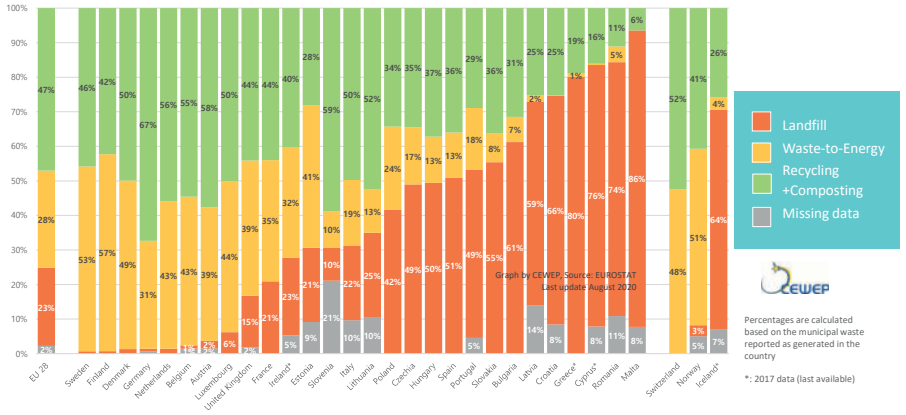
Greenhouse gas emissions of waste management (EU-28, 1990-2017) (million tonnes of CO_2 equivalent)



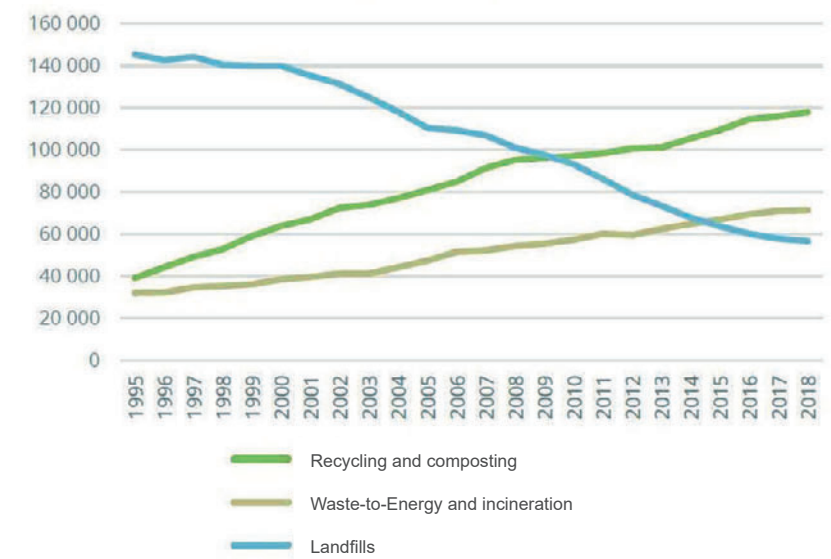
Source: EEA, republished by Eurostat (online data code: env_air_gge)

eurostat

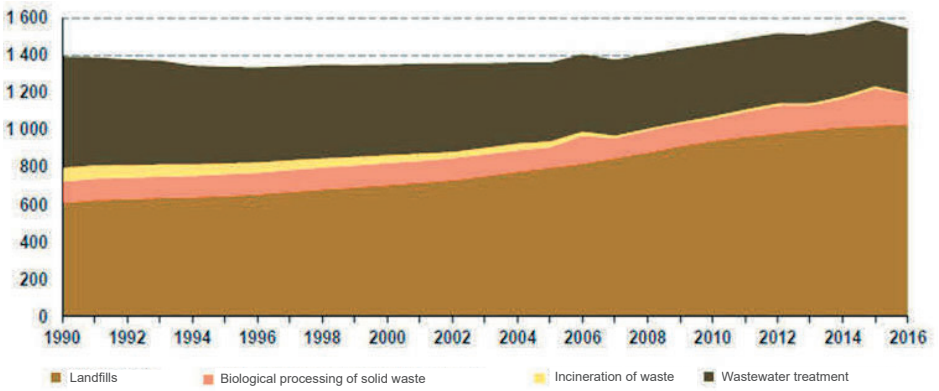
Management of municipal waste in EU countries, 2018 (Source: Eurostat)

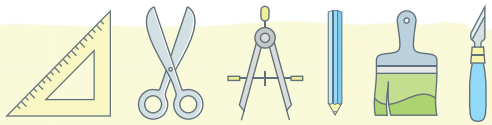


Management of Municipal Waste in the EU (thousands tonnes) (Source: Eurostat)



Development of aggregated greenhouse gas emissions in the waste sector between 1990 and 2016 (Gg CO_2eq.) – by category (Source: SHMÚ)





Speed dating in the future

ZERO WASTE

Zero Waste is a label for a lifestyle that supports the reuse of all resources without creating waste, landfilling it or burning it. According to this philosophy, all resources should be reused as happens in nature (Wikipedia).

#1 Refuse: Reject what you don‘t need.

The most effective way to eliminate waste is to just start rejecting it. Start with the word NO. Say no to promotional items, flyers in the mailbox, plastic bags in the store...

#2 Reduce: Reduce what you really need.

Apply voluntary modesty in your life. Before you make any purchase, think about whether you really need that item (e.g. the fifth pair of jeans or a new cell phone). Is there an option to borrow it somewhere (e.g. a drill or a tent)? Don‘t forget that your purchase today is our waste tomorrow.

#3 Reuse: Reuse and repair.

Not everything that breaks has to end up in the trash straight away. Try to repair things first and keep using them. The production of each new thing requires a lot of energy, water and non-renewable resources from our planet. Don‘t waste them. Buy things that are designed to last and are easy to repair if necessary. If you have the opportunity, buy second-hand (not just clothes).

And of course, you should completely banish disposable items from your life. There is a permanent alternative to everything disposable. Fabric shopping bags, cotton handkerchiefs, glass coffee cups...

#4 Recycle: Recycle what you can‘t give up, reduce or reuse.

Learn how to sort our waste correctly. But don‘t forget that recycling is a financially and energy-intensive process that has an impact on the environment. Although, not all materials can be recycled and turned back into something useful. Therefore, it is extremely important to prevent the creation of waste. That is why recycling should be the fourth priority – only when we can not refuse, reduce or reuse the item.

#5 Rot: Compost the rest.

Up to 40 % of household waste is biodegradable waste. It can be composted into fertilizers that can be used in the garden or for balcony plants. Composting can also be done in an apartment in a housing estate. There are several options to choose from: set up a community compost site, buy a worm composter or an electric composter.

http://www.zerowasteslovakia.sk/

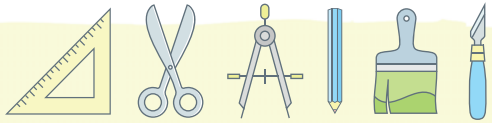
DUMPSTER DIVING

World hunger does not arise from a lack of food, but from poverty, which makes it impossible for some people to afford food. Therefore, wasting food is unethical, unecological and uneconomical. Yet an average of around 180 kg of food per person in the EU ends up in waste every year. According to the UN, up to a third of global food production is thrown away.

Although households are the biggest waste producers in Europe, supermarkets also throw away a lot of food, usually due to expiry dates or surpluses in warehouses. This wastage inspired what is known as dumpster diving. It involves retrieving intact food from containers that supermarkets have thrown away. All in protest against society‘s harsh practices. In addition to the fact that dumpster diving prevents the creation of waste, people who practice it save a lot of money and obtain food they would never buy.

Alexandra, 22, Prague

“I heard about dumpster diving years ago and soon after I tried it myself. Why? I heard somewhere that if food waste were a country, it would be the third largest emitter of greenhouse gases after the US and China. That amazed me. I thought there wasn‘t that much waste in the Czech Republic, but I wanted to see for myself. I now usually find a large amount of completely harmless, often still packaged, food in containers near supermarkets. And not just food! Last time I found three baskets full of beautiful tulips.“



Speed dating in the future

REPAIR CAFES

Repair Cafés are events where people repair electrical and mechanical household appliances, computers, bicycles, clothing, etc. Locals organise these for their communities. Repair Cafés prove to us that it is often not necessary to produce more and more new things, but the best way is to care for and repair our things so they last for a long time. Repair Cafés are held at a specific location where tools are available and there is an opportunity to repair your broken items with the help of volunteers. These measures aim to reduce waste and improve repair skills and community relations. Repair Cafés have been booming in recent years with more than 1,500 locations in 33 countries.

This issue is already starting to become politicized. Repair Cafés represent a differentiation from the consumer society, which is based on constantly buying new things and quickly throwing away old things. Repair Café organizers often criticize that in the current economic system, manufacturers are motivated to produce things that will no longer be functional after a short period of time, the so-called planned wear and tear, and the customer will then have to buy a new item. For example, in France, where planned wear and tear is illegal, Apple was sued and subsequently fined €25 million for intentionally slowing down some older iPhone models to encourage customers to buy the latest model. To reduce the impact on the environment, Sweden has halved the repair tax to encourage the creation of new repair shops and make repairs more affordable.

Patrick, organizer of Repair Cafés, Denmark

"As consumers, we produce a huge amount of waste. Through research at the university, we found that 9-23% of e-waste is functional or repairable material. The situation is similar with other types of goods, such as clothing, toys, furniture, etc. One of the basic problems is that it is quite difficult to find a place that will repair the item at a cheaper price than buying a new product. We can repair many things ourselves, but in a consumer society we are slowly but surely losing these skills and the new generation is not learning them at all."

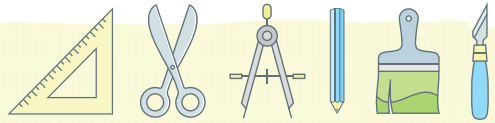
MINIMALISM

In recent years, minimalism has become a rapidly growing lifestyle movement, especially among young people. Research shows that material values are no longer as important to young people ages 18 to 34 as they were to their parents' generation. The proof is in the countless blogs, videos, films and instructions on how to live a minimalistic life. People who join this movement reduce their wardrobe, donate unnecessary things to others, and refuse to buy things that are not necessary and do not bring them long-term joy. The minimalism movement concerns not only the things we own but also the way we live. Part of it is the so-called tiny house movement where many people have decided to live in just a few square meters. It brings various benefits such as simpler living, environmental responsibility or reduced financial expenses.

This movement is a response to the complexity of today's world, the overload of information and things and the acceleration of the pace of life. There is no single right way to become a minimalist, it will look a little different for everyone. If you want to embrace minimalism, you should clarify which things are the most important to you in life and not invest time or money into those that are not. Minimalism introduces a life in which people have more time, more freedom, less stress and distractions. Although this movement alone will not solve all of the world's environmental problems, it represents an important alternative for people who want to live differently and turn social values away from materialistic ones.

Alvin, Czech Republic, minimalism blogger

"Many people go shopping when they are in a bad mood and the reason is obvious. Shopping creates a feeling of short-term happiness. However, it carries its own risks: it is very easy to become addicted to shopping, and it is a means of dealing with a bad mood. The key is to realize that happiness cannot last forever. Without unhappiness, we could never be happy. That's why we should rather look for the use value of things, and observe what things bring us and what use they are to us. Not how we think about them and whether they make us happy. This joy quickly fades. And then we need new things. Again and again. At the same time, positive psychology claims that the feeling of happiness is significantly influenced by one's own attitude and way of thinking, while external influences do not play such a big role."



Speed dating in the future

PACKAGING-FREE STORES

According to the Statistics Office of the Slovak Republic, in 2022 Slovakia created 2.6 million tons of municipal waste (MW). That's an average of 478 kg per person, which equates to around 1.3 kg of waste per day. The recycling rate was 49,5 %. 39,3 % of waste still ends up in municipal landfills and the remaining 10% in incineration plants.

The most effective waste solution is to create no waste at all or to minimize it.

More and more people are trying to follow this trend. There are plenty of blogs, articles or books on the so-called zero-waste lifestyle. Packaging-free shops all over the country, which spring up like mushrooms, are gaining a lot of popularity. We no longer find them only in big cities. In 2022, there were 75 of them in Slovakia. You can shop packaging-free, use reusable bags or fill containers you bring with you. Compared to supermarkets full of processed ready meals or unhealthy snacks, packaging-free shops offer an incomparably healthier range because they also offer local products and organic food. The customer does not have to pay for the packaging and is not tampered with the designer packaging.

Helča, 24, Brno, zero-waste blogger

"As soon as I decided to go waste-free, I changed everything. I went right into it and told myself that from now on I wouldn't buy anything in a package. As a result, I stopped eating pasta for a year because I couldn't find it anywhere without the packaging. The change has been most dramatic in food, because we buy it almost every day. I go to the packaging-free shop. My diet is somewhere between vegan and vegetarian because animal products have a pretty big impact on the environment. I can make toothpaste and plant-based milk and I eat local fruits and vegetables."

REFILL DRUGSTORE

Plastics are almost indestructible. They are lightweight, durable, flexible and resistant to water, sun and mechanical damage. Many pollutants are created during production, but especially during disposal. Many cosmetic and cleaning products are in plastic packaging. The solution is refilling drugstore stations. Customers bring their own bottles or specific bottles that they have purchased at a particular store (e.g. in a DM drugstore, products can only be refilled into containers purchased there) into which they repeatedly dispense their favourite products. Thanks to this type of distribution, the customer avoids advertising and costs for the production of plastic bottles. By reusing plastic packaging, they also reduce the impact of CO2 on our ecosystem. In addition to washing gels, fabric softeners and cleaning agents, you can also get shampoo, liquid soap, bath foam or lotion.

Ecoterra&bibis company

"We can achieve a lot if we change our habits a little. We saved 615,066 bottles and 5,505 kg of CO_2 in our stores. All our products are biodegradable and environmentally friendly."

SHARING ECONOMY

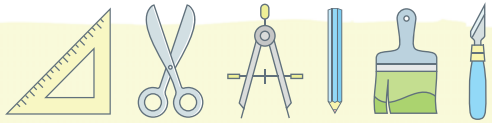
The sharing economy is an economic model based on sharing, exchanging, lending or renting products rather than owning them. You use the object (holiday home, apartment, car, lawn mower, etc.) for personal or business activities only for a certain time and rent or lend it otherwise.

Let's take the example of a car. According to research, the car is in the parking lot 90% of the time. This represents an enormous potential for use. If we were to at least double the usage time from 10 to 20 %, we would only need half the number of cars for car travel. Owning many things could become a thing of the past.

Based on this principle, various communities and companies are emerging around the world that utilize the potential of sharing. Rekolav Bratislava pink bikes and other bike sharing or scooter activities or car sharing Share Car are good examples. Airbnb was created on a similar principle, but this system is currently being criticized because many people not only rent out their empty rooms but also entire apartments to tourists, which makes living space more expensive and reduces the number of available apartments for residents.

Michal, 34, member of the Autonapůl cooperative

"Car-sharing is a good choice primarily because it helps reduce the number of cars on the roads by using a car that has already been manufactured more efficiently." Surveys suggest that the average car drives for an hour a day, which is not very efficient. A shared car is used by more people, companies or other entities, so a smaller number of cars is enough to meet the demand for car transportation. It is said that one shared car can replace 5-10 private cars. In addition, shared cars are usually newer and, therefore meet stricter emissions and safety standards and emit fewer harmful emissions than an average car. The average age of cars in the Czech Republic is 14 years. Autonapůl has cars that are on average less than 2 years old."



Speed dating in the future

FREESHOPS

A Freeshop is a place that works on the principle of community sharing and the circular economy. Many people these days have a ton of things that they don't use often or don't need at all. What doesn't suit one person may be good for another. These things can be taken to the Freeshop, where they receive a second chance for life and someone who needs them can then take them for free or for a voluntary fee.

Freeshops often work voluntarily and have many advantages. Product lifespan is extended, fewer things end up in landfills, people save money and the community and the values of solidarity and sharing are also strengthened. In Bratislava, we have KOLO – a reuse centre. The city reuse centre covers an area of 1,200 m^2 and it's a place where, on the one hand, items that are no longer needed, but on the other hand, preserved and usable items are given a second chance. KOLO serves as a tool for people to avoid waste. It is also a space where items can be repaired and thus their lifespan extended. KOLO also includes the HUB – an educational and creative centre for people from Bratislava and the surrounding area. In addition, it cooperates with the non-profit sector and organizations that support socially weaker and disadvantaged population groups. All funds collected are recorded as contributions to the public collection, which are further used to protect and create the environment. In May 2023 they won first place in the Via Bona competition in the Green Company category.

Helena, 22, co-founder of Freeshop in Olomouc at UPOL

"I think Freeshops are great. They represent not only a criticism of the capitalist mentality based on consumerism and disposable items but also a possible practical alternative. They also destroy the stereotype that we have to pay for everything. I like to bring things that I no longer use to the Freeshop. When I see someone take them and use them, it makes me happy. At the same time, I always find something for myself there."

CLOTHES SWAP

Having constantly newer clothes has become a part of modern life. However, this comes at a price: the textile industry is the second most polluting industry in the world after the oil industry. Our closets may be full, but most of us only wear a few favourite pieces and the rest stays in the closet. What to do with them? Old clothes collected in containers often end up in Africa, where they harm local clothing markets. There is no reason why clothing should be shipped so far. It looks like there is already enough of it in the world.

Clothes swaps are events where people (known and unknown) bring clothes they no longer use and can take something else in return. These are becoming increasingly popular. They are a way for people to spend pleasant time together or to meet new people and exchange old for new. Such an exchange can take various forms. One of them is to organize a swap at your home for a few best friends or at your school or work. But they can also be large events with hundreds of people for the entire city.

Kateřina, 27, a participant in the swap in Prague

"I really enjoyed the last couple of swaps I took part in. Thanks to them, I had the motivation to go through my closet and swap out clothes I no longer use for ones that fit me better. In one of these, each participant also told a story at the end of the event about a piece of clothing they had brought with them. Some of the stories were really funny. To make the swap work, you need to think about how the clothes are presented - it's best to hang them on hangers, divided into different themes or categories. When clothes are just thrown into a pile, they seem to lose value and people don't want to rummage through them."

Speed dating in the future

CIRCULAR MAPS

Want to know where to find packaging-free shops, community composting sites, rental stores, repair shops, tailor shops and places to drop off used toothbrushes? Look at circular maps of Slovak cities. They currently exist in 15 Slovak cities (Bratislava, Banská Bystrica, Zvolen, Liptovský Mikuláš, Malacky, Prievidza, Dubnica nad Váhom, Bardejov, Sabinov, Trnava, Trenčín, Nitra, Žilina, Prešov, Košice). Their creators are usually individual passionate volunteers or non-profit organizations. There you will find packaging-free shops, collection points for sorted waste, second-hand shops, service and repair workshops, rental shops for various things, bookstores, drugstores and others.

As part of the School of Sustainability project, the Friends of the Earth – SPZ association runs a map where you can find packaging-free shops in Slovak cities where you can shop without packaging/waste, especially food and drugstores.

Announcement of the city of Pezinok

We would like to inform you about the planned creation of a circular map that will help you find packaging-free shops, rental shops, repair shops, tailors and places where you can drop off used items and batteries. This map aims to promote a sustainable lifestyle and resource sharing in our city.

If you have a tip for a business that you would like to see on our circular map, please let us know.

You can do this by filling out a short questionnaire, which you can find at the following link: https://arcg.is/1fPOjW0. Your suggestions and recommendations are very valuable to us and help us create the most comprehensive and accurate circular map possible.

Some cities already have circular maps whose main purpose is to inform residents about sustainable shopping, repair and recycling options in their area: https://www.incien.sk/publikacie-incien/cirkularne-mapy/

Creating a circular map is an important step towards a sustainable future. We believe this map will be a useful tool for you in finding eco-friendly and sustainable options in our city.

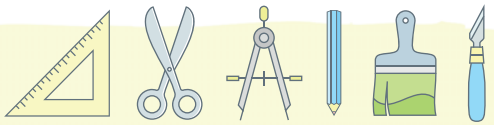
CIRCULAR ECONOMY

The economic model of current society has so far been predominantly linear. We extract natural resources and bring them to the other side of the world, where products are made from them. These are distributed to other parts of the world where consumers buy, use and throw them away. This creates waste. Raw materials in the form of products end up in landfills and incinerators or thrown into nature. The core of the profit of this system lies in the high consumption of non-renewable raw materials, which logically cannot work in the long term. Adding other negative factors such as the exploitation of labour from developing countries, the population explosion, rapidly growing consumerism and the devastating impact of humans on the environment, we can rightly consider the current system to be unsustainable. Economically, ecologically and socially.

The opposite of the linear model is the circular economy, which has been a key political issue in the EU since 2015. In addition to a stable economy, the circular model should also ensure a healthy environment. The yield in this system is based on the efficient use of natural resources through efficient recovery. And not just materials, but above all products and their components. This significantly minimizes waste and the costs of input materials and energy required to produce new products. The main features of this model are the use of renewable energy sources, rental, sharing, support of local trade, eco-innovation or eco-design. The focus in the circular system is on products with a long lifespan and long service life. They are perceived and designed as raw material storage facilities. What is crucial is the simple disassembly, which enables the separation of individual components or materials and their subsequent evaluation. The result is the disposal of waste that can no longer be used.

Denisa Rášová, coordinator of the "Circular Slovakia" platform.

"The circular economy has different strategies and business models that allow us to influence the product at different stages of its life cycle." Whether in the procurement of raw materials, in design, in sales or in the post-consumer area. If the product becomes waste, the circular economy also has various strategies to process it as efficiently as possible and bring it into the cycle. In professional practice, it is said that the circular economy should not be confused with the recycling economy. Recycling is one of the final steps of the circular economy. In addition to glass or aluminium, a major problem today is maintaining the quality of the material after mechanical recycling. Quality is usually lost through recycling. For example, the fibres in paper shorten each time they are recycled, meaning new cellulose has to be added anew."



Speed dating in the future

COSMETIC PACKAGING TAKE-BACK

Some companies that sell organically certified cosmetics have implemented a recycling programme. The principle is to return empty cosmetic packaging to the manufacturer. This is how glass containers from creams, deodorants, glass bottles or containers made of PLA plastics are collected. You will receive a discount on other products for the packages handed over in this way. You can hand the packaging in at collection points, in shops or send it by post.

SAVON company

"Packaging handed over in this way will be used again, but not for refilling with a cosmetic product, as this is not possible for hygienic reasons. We give these packaging a second life and you will be able to enjoy them as our recycled soy candles. The packaging must be returned complete, the jar including the lid, along with our label so that we can identify it as our packaging."

MILK AUTOMAT

Milk Automats are an excellent way to get fresh milk into your own container. The advantage is that you draw exactly as much as you need. The milk is fresh and you don't produce unnecessary waste. You can make your own cheese, cottage cheese, yoghurt or kefir from the fresh milk drawn in this way. Most people buy milk cheaper at the supermarket, but Milk Automat has a higher fat and vitamin content. The milk is not pasteurized and therefore must be consumed within 48 hours of production. Raw milk must be boiled before consumption. By purchasing, you also support the local agricultural cooperatives from which the milk comes.

Miriam, customer

"We only use this milk at home; it tastes great when cooked. I loved the Milk Automat because I can use it to make cheese, cottage cheese and sour milk, which I can't do with the packaged one. We are milk lovers consuming maybe 20 litres per week. So many bottles and boxes wasted if we buy it in the store."

LIBRARY OF THINGS

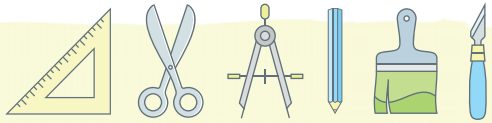
There are regular libraries where people borrow books. So why not borrow other things too? The Library of Things is an area where you can find variousitems to borrow. Because you don't need it for long, you don't want to own it for ecological reasons, you can't afford it, you don't have room for it at home or you just like the idea of sharing. You can borrow tools, musical instruments, sports and camping equipment, household appliances and furnishings, and more.

How does it work? As a rule, registration or payment for club membership is required. You can rent the item for a few days or weeks for a small fee. Borrowed items must be returned clean so that other people in the community can use them immediately. Libraries of Things are located, for example, in Bratislava, Trenčín, Stupava, Trnava or Žilina.

Founder of the Library of Things at the Goethe Institute in Bratislava

"From the beginning, we saw the idea of creating a Library of Things and offering workshops based on sharing things and knowledge as a challenge aimed at connecting people and an awareness of the importance of a sensible approach to ownership, sharing and exchange. We have expanded our existing concept of exchanging and sharing books, textbooks and audiovisual media in exchange for a library membership fee to lend out practical, often financially valuable things that we enjoy using, but not often enough to own and buy them.

In our library, we have reserved a special place for 50 objects from 4 different areas. When choosing things, we took into account: the utility factor, to offer people practical things that can be used for work around the house or in the kitchen; the factor of free access, so that people can borrow things from us that they cannot buy for economic or other reasons; and the educational-entertainment factor, so that our things serve for education and pleasure."



Speed dating in the future

EDIBLE PACKAGING

The majority of waste consists of packaging for various products. What about not throwing away the packaging and eat it straight away? Several people have already come up with this revolutionary idea. In Košice and Banská Bystrica there is a fast food bistro where you can buy different types of soup in edible containers.

Microbiologist Miroslava Kačániová has been researching the antimicrobial effects of plant essential oils and medicinal plants against various microorganisms for years. In 2019, thanks to the APVV grant call, she established collaboration with experts from Minsk with whom she is developing edible packaging options. The packaging consists of special starches and sodium alginate, which dissolve in the mouth because certain processes take place thanks to saliva. They tested them for meat packaging and compared them to meat without any packaging. Compared to packaged meat, I can say that the number of microorganisms on it was significantly lower compared to the control group. We discussed with the Belarusians, where could they have potential, whether we could also use them to pack cookies or various baked goods and came to the conclusion that they can be used in a wide variety of ways, including for confectionery or dessert packaging.

Microbiologist Miroslava Kačániová, Faculty of Horticulture and Landscaping at the Slovak University of Agriculture in Nitra

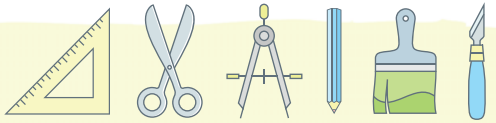
"We try to add the same flavours to the edible packaging as when cooking at home – oregano, thyme, basil, rosemary or cinnamon." At high temperatures, the packaging dissolves and we can consume it together with the food. We are currently waiting for a patent for this idea and would then like to offer this packaging to companies."

COMMUNITY REFRIGERATOR

OZ Free Food presented public refrigerators for the first time during Ekotopfilm in 2014. Despite the positive response, it was not possible to implement the project permanently due to legislation and the authorities' decision. The main problem is that, under current law, the refrigerators must be managed by a food company. They would have to be in a cafe or restaurant that caters to them. In November 2017, the first community refrigerator was opened in Nova Cvernovka in Bratislava. A community refrigerator is an alternative to a public refrigerator, but it is not on the street but is part of a space that is shared by a specific group of people. In this case, these are people who live or work on the premises of the Nova Cvernovka on Račianská Street. Anyone in this community can put food in the fridge or take it. The project aims to give food, that would otherwise become waste, a second chance and thus limit its waste. In November 2021, they installed two community refrigerators in the dormitories in Mlynská dolina. Students who study late at night and are hungry for something to eat or, on the contrary, do not have time to finish dinner, can use the "services" of these refrigerators.

Michaela Prablesková, initiator of community refrigerators in the dormitories in Mlynská dolina

"When the idea for this project came about in 2019, I was still living in the Bratislava dormitories. It often happened to me that I've travelled home for the weekend and had leftover food that I didn't know what to do with. I noticed the same problem with several students and thought about setting up a refrigerator for food sharing."



Speed dating in the future

FARM SHOPS

Farm shops are primary producers who sell their products or surplus crops and livestock in small quantities directly to the end consumer. The prerequisite is that the products are made from their own raw materials. Sales from the farm and direct contact between the consumer and the producer are the basis of sustainable agriculture, not only in Slovakia. It's a great way to support local farmers and buy home-made products without unnecessary packaging and in organic quality. Currently, there is also an information room for local/small food producers and consumers interested in home-made, agricultural and traditional products sold from the farm. Here you will find, for example, a map of farms, farm shops or crate deliveries (a mix of fruit and vegetables delivered in a crate).

Jana, 35, customer

"I regularly go to the local farm to buy milk and dairy products. The owner and I have become friends, so in addition to the ecological benefits, I also see a big advantage in making contact with farmers and owners. I know where the products I buy come from and I believe they are of higher quality and more beneficial for my family's health."

LITTLE FREE LIBRARY

This beautiful project of friendship, humanity, community life and ecology has been running in Slovakia for several years under the name Little Free Libraries - Thank you neighbour. (Slovak: Knižné búdky – Ďakujem sused.) These are public libraries in which old or read books are made available that would otherwise lie untouched on the shelves for a long time. Small, friendly wooden house-shaped boxes can already be found in many cities in Slovakia. Anyone interested can hand in a book to the library, exchange it or borrow it and return it. Everything works based on voluntariness and interest. Behind this interesting idea are two young women from Bratislava, Evka and Janka, who decided to bring people together through books. The first one was installed in Bratislava in 2013 and since then the project has expanded to larger and smaller cities in Slovakia. In addition to the capital, you can find these libraries for example in Martin, Trnava, Košice, Bernolákovo, Levoča, Žiar nad Hronom, Nové Mesto nad Váhom, but also in smaller villages, as Mojtín, Lovčica-Trubín and many others. The idea comes from the world-famous Little Free Library project.

Matej Bórik, CEO of the METRO Association

"Many of the bookshelves are included in the map on the „Ďakujem, sused" project's website, in addition to the exact location, there is also information about who looks after them – it is always a specific community or organization." We look after some of the boxes directly. Certain rules apply to setting up such a box. Before implementation, it is important to obtain approval from the property owner, the county or the company where the box will be set up."

APRIL

I EAT WHAT I KNOW

I Eat What I Know

You need to know

We all have to eat. **But do we know what impact food has on climate change and vice versa?** The cultivation, production and disposal of food have a large carbon footprint that contributes to climate change, and climate change in turn affects the quality and quantity of food, and our ability to grow enough food. We are using more land for agricultural purposes than ever before, and unless we change our consumption habits and our food production system, population growth will only increase the demand for land.

An average person on Earth consumes **2,940 kcal per day**, which is **1.3 times more than the recommended daily intake.** To produce that much food, we need to get as much food as possible from every single acre of land. **Intensive agricultural production** (most often in the form of huge monocultures) leads to the loss of forests, meadows and wetlands, requires greater use of mechanics that compact the soil, is powered by fossil fuels and also requires larger amounts of fertilizers and pesticides that are a source pollution and harm pollinators.

A typical example of intensive agriculture is the **production of palm oil**. It is found in almost everything. Nearly **50% of packaged products** in stores contain it: in food, cosmetics or even cleaning products. In many parts of the world, it is also used in animal feed and as a biofuel. The problem with palm oil, however, is the amount of emissions associated with its cultivation. **Clearing one hectare of forest releases up to 174 tons of carbon dioxide into the atmosphere.** A side effect of the mass cultivation of oil palms is extensive forest fires, massive use of pesticides and the destruction of habitats of endangered species. Human rights violations of local communities that oppose this activity also occur frequently.

Global trade, the growing consumption of exotic foods and the demand for year-round availability of popular crops are leading to intensification of transport and lengthening of supply chains. This is due to the high consumption of fossil fuels, energy and protective packaging. The biggest paradox remains the fact that **40% of the food produced is never eaten.** The equivalent of six garbage trucks of edible waste are dumped every second. It often ends up in landfills, where decomposition releases harmful methane.

Food production contributes significantly to climate change. The root of the issue lies in its linear nature: take, produce, waste. From production, consumption and packaging to transport and disposal, food is responsible for a third (35%) of anthropogenic greenhouse gas emissions. The food system is their largest producer and therefore has the largest carbon footprint of all areas and sectors of our society.

The solution could be a **circular economy**, where the environment is regenerated rather than degraded during food production and the edible parts are healthy and compostable. There are various ways to use the soil and improve its condition and fertility while limiting the impact on climate change. One of them is the so-called regenerative agriculture, which minimizes chemicals, avoids monocultures, uses cover crops and limits the use of heavy machinery and equipment. A positive example is also the Eco-schemes, which aim to support farmers in sustainable management.

Let's try to live by the saying: **I eat what I know...** where and how the food was grown or produced, what it contains, how it was transported to us, what kind of packaging it has, what kind of waste it produces. All of this tells us what impact it has on the environment and climate change. With our consumer approach in stores, favouring unpackaged and seasonal fruits and vegetables, organic produce and buying from local producers, we can help transform an unsustainable food system into a sustainable one. In this case, too, staying local is our future.

More on this topic

How big is the carbon footprint of food? – article: Food plays a significant role in climate change

What goes on our plate – information about responsible diet

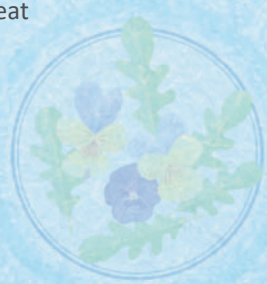
Eat Responsibly – projekt o jedlej zmene a zodpovednom stravovaní v školách, v slovenčine

Free Food – information about food waste, food carbon footprint, solutions and advice

Edible Change – a guide for teachers and young people who want to change the world

How many emissions does our diet make – an article about the carbon footprint of food we eat

Green School – a nutrition guide



Let‘s go!

2030 Climate Target

Targeted strengthening of food self-sufficiency by linking to the preference for local foods, which often have a smaller emission footprint, mainly as a result of transport (Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050).

What’s the hold-up?

Tomatoes from Spain, garlic from China, potatoes from Poland. Most of the products in our grocery stores still come from imports. Although demand for local production is increasing, foreign foods still dominate the shelves. Supply reflects demand, and the fact is that many foods are simply more expensive to produce in our country than on the other side of the border.

THE CHALLENGE

Weeds to the Kitchen

Nature gives us much more than we think. Include wild plants and weeds in your diet. Try new flavours to enrich your diet. Some are medicinal and contain many vitamins and minerals. However, not all of them are edible. Learn to distinguish them, ask your elders, and look for information in books or on the Internet. But observing nature is the best.

1. Pick wild herbs or edible weeds from nature’s supply.

2. Use these ingredients to prepare simple meals (e.g. salad, spread, cookies, soup, pesto, syrup, spices). Be creative.

3. Share your experience with edible weeds on www.ewobox.sk.

Photo: Jana Rajnohová

Cherries, Cherries

OBJECTIVES:

- Know where fruits and vegetables come from and which ones are currently in season.
- Build skills and practical knowledge in planting and growing plants.
- Promote children‘s interest in local products and food.

THINK & FEEL

(Evocation)

Tell the children the **puzzle** from the Handouts. Then talk about cherries: Who likes cherries? When do we eat them? What time of the year? Repeat the same with some exotic fruits (e.g. pineapple, mango, coconut). Then ask about their favourite fruit or vegetable: When do they enjoy them? All year round or just sometimes? Why?

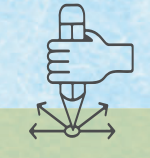
Also, show on the map where each fruit or vegetable comes from. Make sure children can distinguish between what is grown here and what is grown outside Slovakia. Explain to the children that vegetables and fruits are grown and harvested by farmers before being sent on trains, ships and trucks to our local supermarket. Complete the **I know When I Eat** worksheet together.

KNOW & EXPLORE

(Awareness)

Find out if the children know where the food comes from. One by one, show them different products that children can easily identify (e.g. milk, egg, meat, cheese, bread, jam, yoghurt, salt) and talk about where they come from. Then test your knowledge on the **I Know Where They Come From** worksheet.

Play farmers and grow your own edible crops (e.g. beans, peas, radishes, onions). You can also try herbs or microgreens as they work well indoors. Ask the children to draw their **Idea of a Plant** on the resource worksheet. What do they think it will look like when it grows up? Then compare the adult plant with the children‘s drawings. Talk about how great it is to grow your own vegetables or fruit. Our food doesn‘t have to travel far to get from the field to our plate.



ACT & CHANGE

(Reflection)

Arrange for the children to visit a local farm, farmers market, or store. See how each local food is produced (e.g. milk, cheese, etc.), and combine this with tastings and conversations with the farmers.

Create a calendar together with the fruits and vegetables available for each month. Use the symbols to indicate which species are seasonal – i.e. they can also be grown here in the respective month (SK mark) and come to us from different parts of the world (Truck mark).

Puzzle

It is sweet and juicy,

Girls pick it,

Mothers pick it,

Crows bite it.

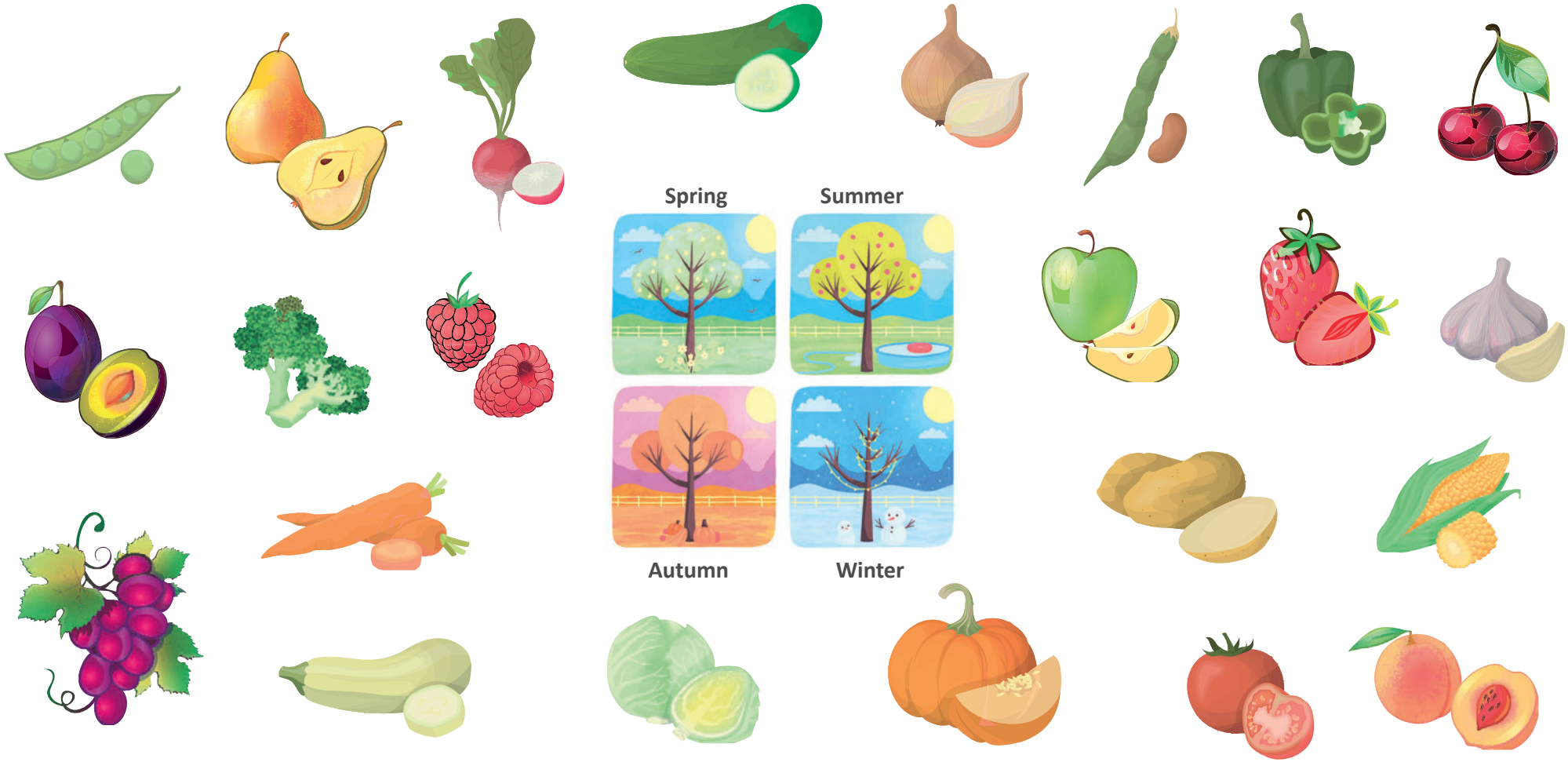
It has red cheeks, it is ….

(cherry)

I know When I Eat

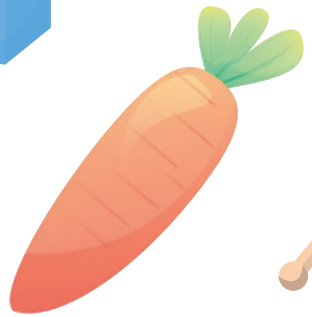
Do you know when you eat an apple, a pea or a cherry?

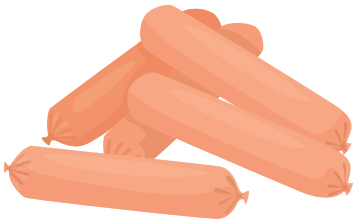
Name the pictures of fruits and vegetables and match them with the pictures of the seasons, depending on when they are harvested and when we eat them. If we process them correctly, we can benefit from the harvest all year round.

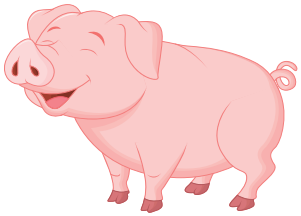


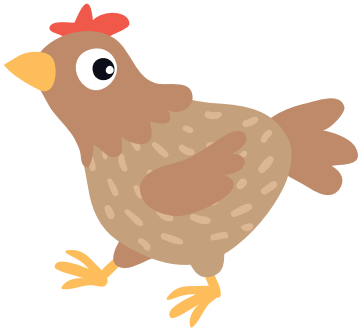
I Know Where They Come From

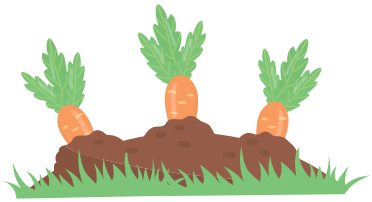
Do you know where the food comes from? Connect pairs with a line.

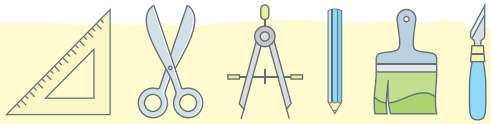












Idea of a Plant

Draw what you think the plants you planted will look like.

My name: .....

Plant A	**Plant B**	**Plant C**
.....	.....	.....

Food Around Us

OBJECTIVES:

- Develop sensitivity and respect for nature.
- Learn to get to know the nature around us and its importance.
- Master food preparation with the help of local resources too.

THINK & FEEL

(Evocation)

Prepare the tools in the form of a chocolate bar and the ingredients that compose it. In the introduction, ask the children: What are your favourite sweets? Would anyone refuse this candy bar? Do you know what's inside? Then, work with students to identify all the ingredients and find out where they come from. Place a world map on the floor and place each ingredient in the countries where it was made. **The Chocolate Bar Analysis** image provided in the Handouts serves as a resource.

Find out what the children think about such a little treat coming from all over the world. Is it right? How about other foods? What can we do to prevent our food from travelling so much? Tell the children that many raw materials can be replaced with local resources. In spring, nature opens a shop where we can even buy them for free. They will find out what it has to offer by solving the **Puzzle** (in the Handouts). The correct answer is: *eat weeds*. Further information can be found in the **Edible Nature Curiosities** worksheet.

KNOW & EXPLORE

(Awareness)

In spring, take the kids outside to "nature shop" and pick herbs. Bring a pocket-size atlas or a book about herbs and learn what you have discovered. For example, the PlantNet application, which you can download free of charge to any smartphone (video tutorial), will help you with this.

When collecting and processing plant parts, follow simple rules: 1. Don't eat anything you're unsure about; 2. Collect only in clean places; 3. Use airy containers (basket, paper or cloth bag); 4. Use the collected parts in teas, salads, syrups, spreads, wraps, and soups; 5. Don't forget to add the unprocessed leftovers to the compost.

ACT & CHANGE

(Reflection)

Write down recipes in which you have used edible plants. Bake together, for example, the **Flower cookies** without palm oil. You can find the recipe in the Handouts.

You can also make them salty and use herbs instead of flowers. Or get creative and make your own recipes to share.

Chocolate Bar Analysis

Locally made, ingredients imported from around the world

Cocoa
(West Africa)

Calcium sulfate
(India)

Palm oil
(Southeast Asia)

Soy
(Brazil/Argentina)

Salt
(China)

Yeast
(Europe)

Milk
(Europe)

Cereals
(East England)

Sugar
(Caribbean)

Crossword puzzle

Try to solve this crossword puzzle and find out what nature has to offer you in its store for free. Write down the name of plants which you can see on these pictures:








Edible Nature Curiosities

I don't know, I don't collect. I am scared. What if I get poisoned? These are our normal reactions to the plants and flowers in our immediate surroundings. At the same time, there is whole garden of edible pieces outside. Some are commonly considered weeds, but in addition to soothing the tongue and stomach, they also contain many vitamins and nutrients. Harvesting edible flowers and plants is effective, chemical-free and costs nothing. Flowers that you can find in every garden and that you can use include daisies, violets, black elderberry, Shepherd's Purse, Pot marigold, lavender or Dead-nettles flowers. We also have nasturtiums, violas, or chive, sage and Ground-ivy flowers.

1. Did you know that you can also eat the **Common comfrey?** Its large leaves are rich in protein. When chopped, we can use it like parsley in salads and to season or decorate dishes.

2. **Red Clover** is a perennial plant that grows in grasslands in meadows, roadsides or forests. Along with other types of clover, it is abundant everywhere. Due to its high protein content, it is used as animal feed. In the kitchen, fresh leaves and flowers can be used to decorate salads, soups and spreads.

3. Not only bears, we also like the leaves of **Bear Garlic**, but not everyone knows that we can also eat its flowers. Some even think of them as poisonous. They are edible and taste just like their leaves.

4. Even a part of **conifers** can be eaten. The pine trees are expected to bloom in the south of Slovakia at the beginning of May. Their male cones are yellow, green or red and resemble a pineapple in shape. We can also eat them raw. They are very healthy - they contain pollen, lots of vitamins and nutrients!

5. **Dandelions** are also edible. They are also sold in markets in various countries, such as France. You can eat its leaves, but also its flowers, which are suitable for salads or smoothies. Its leaves can be added to soup.

6. **Elderflowers** are very tasty and sweet. They can be used to prepare pancakes or sparkling drinks, for example. They are often made into syrup. Elderberry contains many health-promoting substances.

7. **Ground-ivy** can be found throughout Slovakia in bushes, forests, meadows - everywhere from plains to mountains. This herb treats inflammation of the respiratory tract, cough or congestion. It is also used in the kitchen. It has a slightly spicy taste.

8. **Lilacs** have edible flowers. They can be made into syrup, but can also be used in salads. They are very healing and support immunity. They have a bit bitter taste.

9. **Violet** is the queen of spring. A beautiful flower with a distinctive scent. The whole flowers with calyxes are edible. All types of violets are edible, not just fragrant violets. We can use it in the kitchen for cakes but also salads. Violet syrup is used against coughs and insomnia. Violet sugar is also interesting.

10. **Speedwells** have tiny blue flowers that appear in gardens almost all year round, sometimes forming an entire carpet. They are edible and can therefore be used as a decoration in salads or herb butter or as a decoration for desserts and drinks. Leaves with a bitter taste can enrich salads. They also go well with cheese, nuts and pears.

11. **Daisies** have a nutty, slightly spicy taste. They can be eaten whole, although the stem can be a bit bitter. Therefore, eating flowers is particularly recommended. We can add them to any vegetable or fruit soup or cold salads before cooking. They taste great on bread with butter. They have an antioxidant effect, so it's worth enjoying them even while taking a walk in nature. They also wonderfully refresh and decorate summer lemonades.

Flower cookies

Ingredients

- 100 grams butter
- 190 grams spelt flour
- 40 grams cane sugar (or 30 grams vanilla sugar)
- 2 tablespoons honey
- a pinch of baking powder
- 1 egg yolk
- flowers

Instructions

1. Mix all ingredients with your hands to form a firm dough.
2. Let the dough rest in the fridge for 30 minutes.
3. Roll out the dough and cut out round cookies.
4. Press an edible flower onto each cookie.
5. Bake the cookies in an oven preheated to 170 degrees for about 6-7 minutes.
6. Take them out to cool dawn. Bon appétit.

Source: https://karotka.sk/kolaciky-s-jedlymi-kvetmi/

Photo: Jana Rajnohová, SAŽP

My Food Journey

OBJECTIVES:

- Recognize the impact of diet on climate change.
- Know the unsustainability aspects of the current food system.
- Be able to look for solutions and be responsible with nutrition.

THINK & FEEL

(Evocation)

Draw the students' attention to the fact that the whole world appears on our plates. For example, we drink tea from China for breakfast, have fish from the Atlantic for lunch, and in the evening we eat potatoes from Indonesia fried in palm oil. Then have the students analyse the food in the **On the Plate** worksheet. Can you find the difference between them? (*one dish comes from far away, the other from local products*). Also, think together about the image of the map full of lines. It represents a network that captures the interactions of the global food trade. Discuss where and where food "travels" from. Are all countries equally involved? Do these roads have anything to do with climate change?

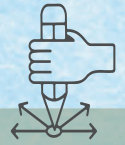
KNOW & EXPLORE

(Awareness)

Give the student the **Food Mile** worksheet (in the Handouts). Their task will be to find out the adventurous journey of their favourite food and its carbon footprint, i.e. its contribution to climate change. They can work individually or in groups, compare the results at the end and discuss possible solutions based on the questions in the worksheet. Remind the students that transportation accounts for only one part of the carbon footprint of food. Another part comes from production, processing, and packaging, but also during disposal (especially if it ends up in landfills).

In the same way, the students can process their breakfast, lunch or dinner and compare their results. The same food can leave a large footprint on one person and a small one on another. It depends on whether it was purchased, e.g. as a semi-finished product or cooked from your own or local sources.

Tell the students to choose any agricultural crop and try to write a story about its journey from seed to plate (from cultivation to ripening, packaging, export, import, sale, transportation to our houses all up to the waste it transforms to). They can be presented in the form of pictures, posters, comics, photographs, poems, short stories or Instagram stories. **The Banana Journey** picture (in the Handouts) can serve as an inspiration.



ACT & CHANGE

(Reflection)

Implement a school information campaign about the connections between our diet and climate change. In the form of a project and collaboration with the school kitchen, the students can explore the possibilities of buying ingredients from local farmers and reducing the carbon footprint of school meals.

Have the students work on the **Searching for the Way** worksheet that they can use, individually or in groups, to think about and propose solutions related to the sustainability of the food system and its impact on climate change.

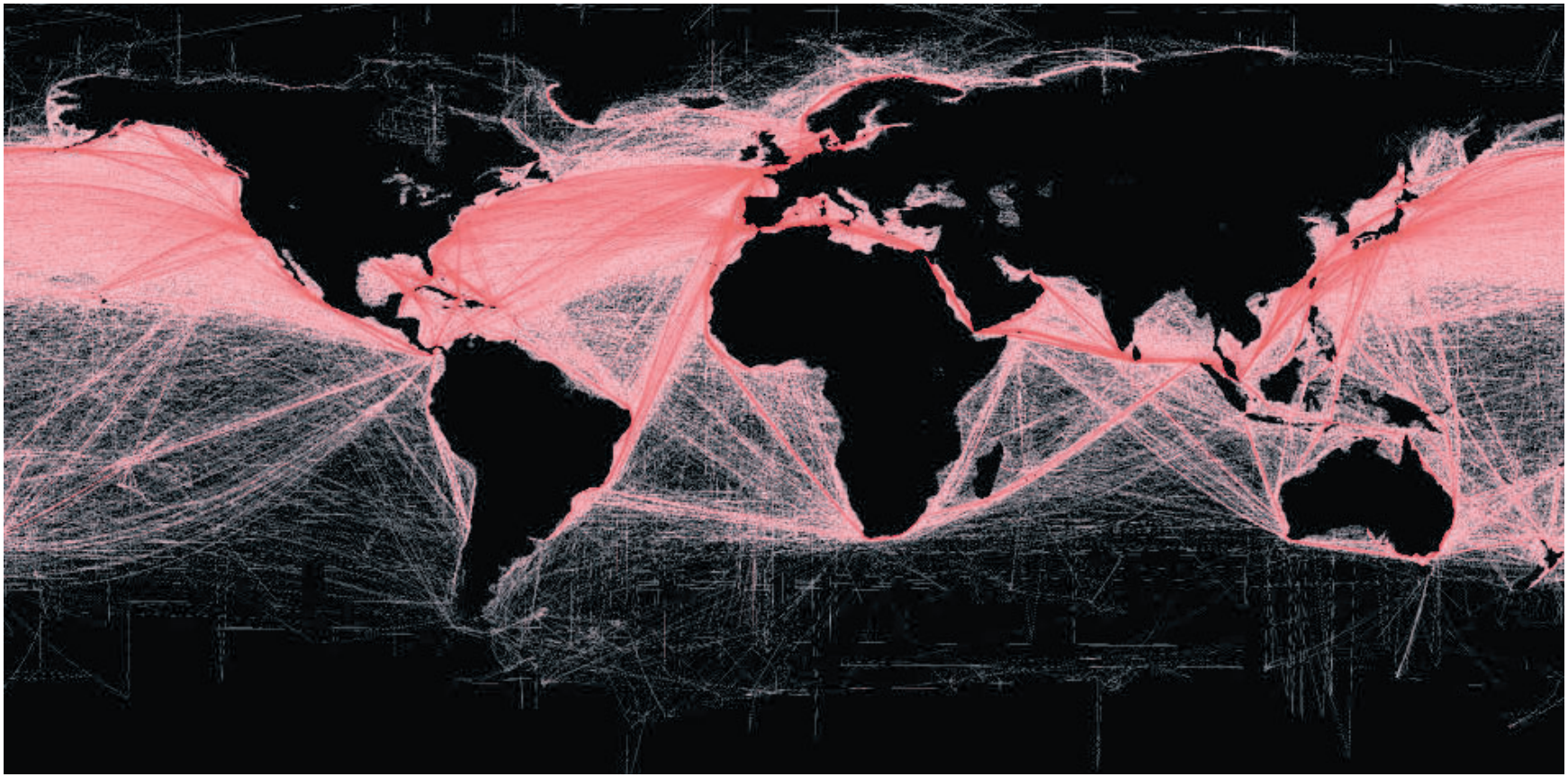
On the Plate

Do you recognize the food on these plates? Try to figure out the differences between them in terms of their impact on the environment and climate change.

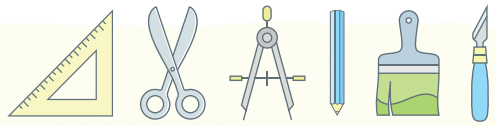
Source: https://www.mealujemto.sk/bryndzove-halusky/
Source: https://www.zdravoafit.sk/

On the Plate

What do you think this map might represent in terms of food?



Source: B.s. Halpern (T. Hengl; D. Groll) / Wikimedia Commons



Food Mile

Imagine your favourite food. Think about what it is made of and write down the basic ingredients into the table. Look for the country of origin on the food packaging and mark it on the blank card below the table. Using https://foodmiles.com/ you can calculate the distance that individual ingredients travel to us in Slovakia. You can calculate the approximate carbon footprint of individual ingredients by multiplying kilometres by a constant unit of 130g CO_2. To compare the total carbon footprint of your food, you can compare it to the footprint of selected foods on Food carbon footprint website from the BBC workshop.

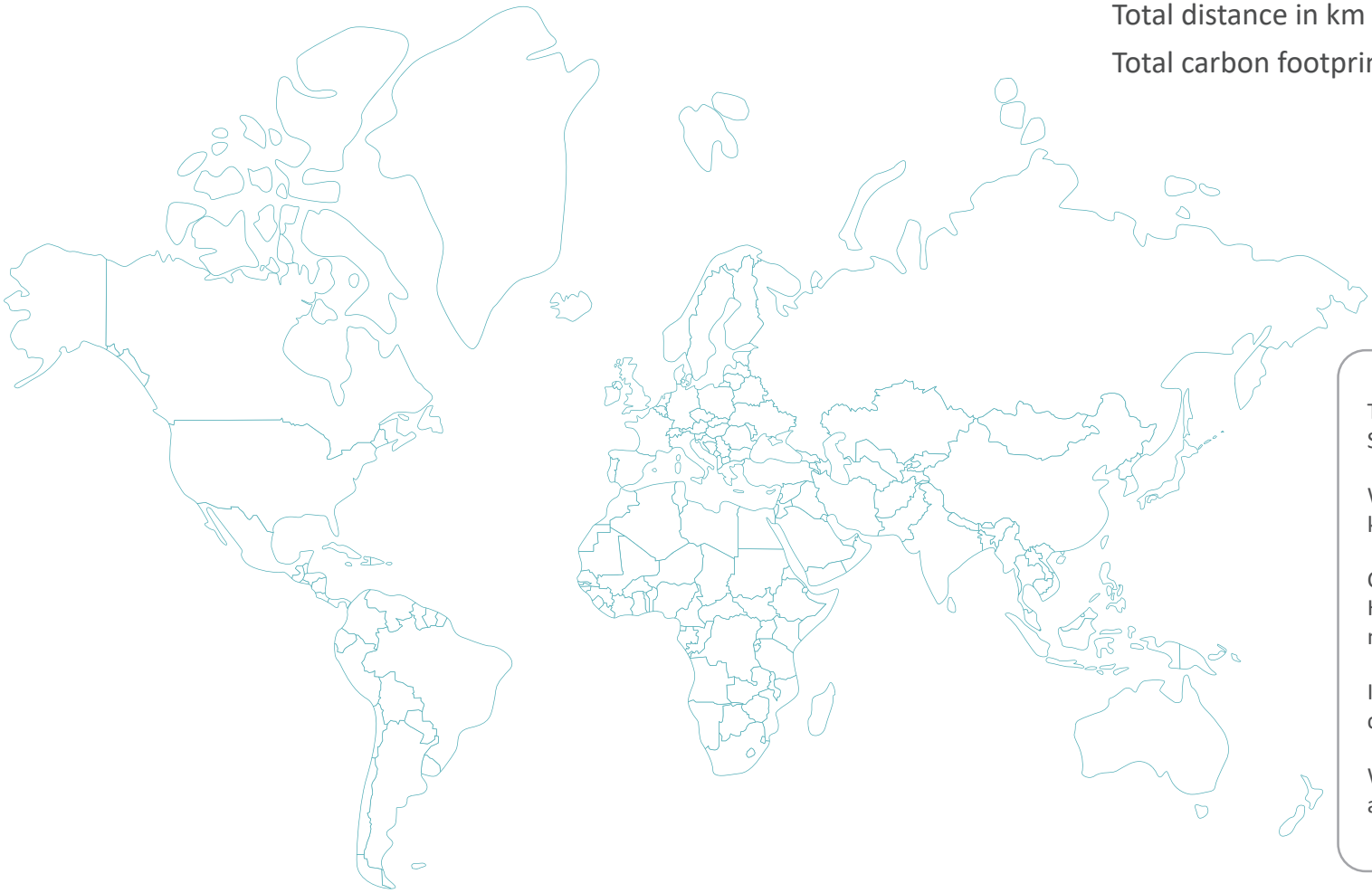
1. Ingredient	2. Country of origin	3. Number of kilometres travelled to Slovakia	4. Carbon footprint (km x 130 g CO_2)

Food Mile

Food name .....

Total distance in km .....

Total carbon footprint: .....



Think about why does so much food come to Slovakia.

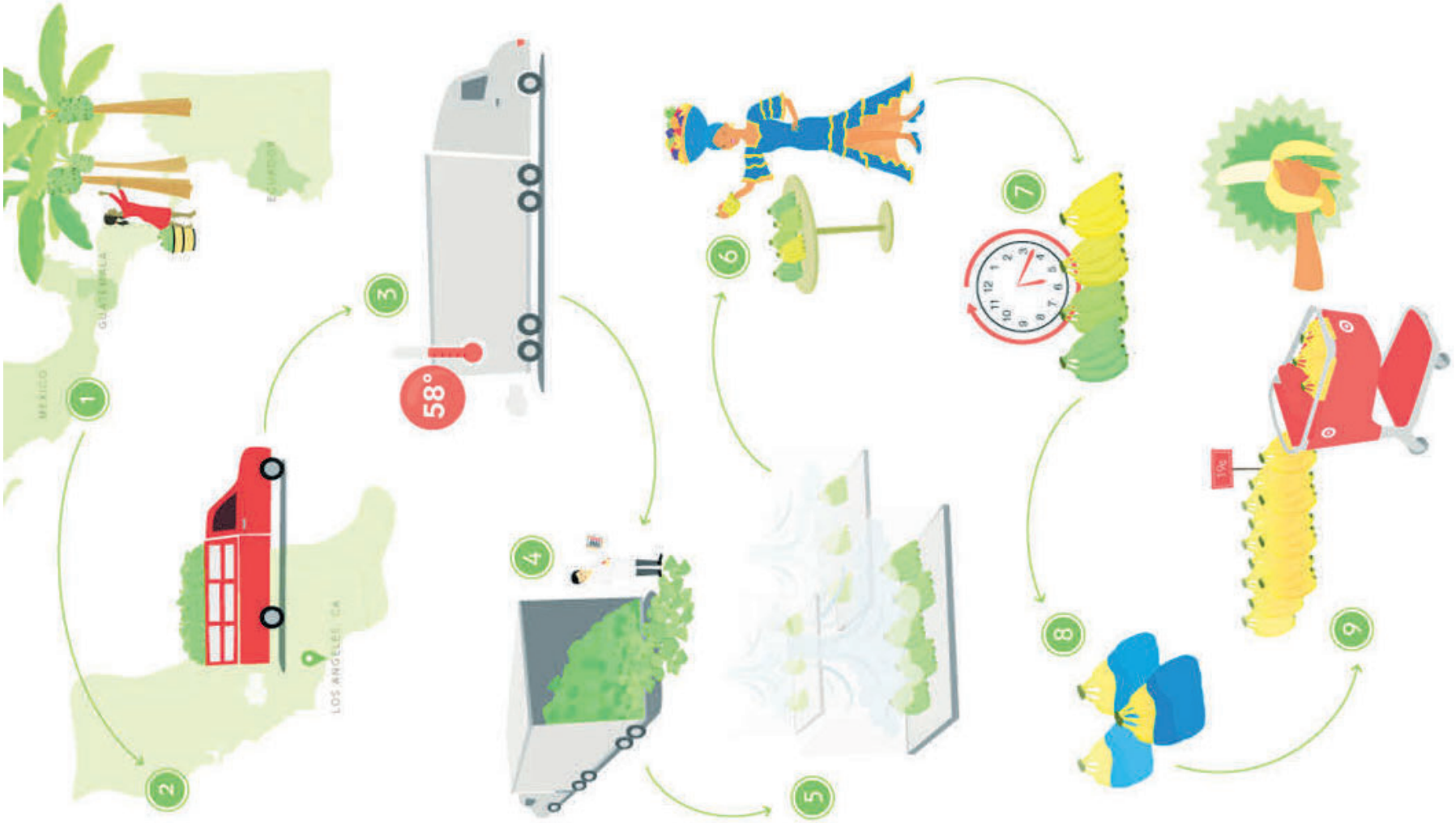
Which ingredient has travelled the most kilometres and which has travelled the least?

Could we replace them with local ingredients? How much would your favourite food‘s food miles be reduced?

Is transportation the only source of food carbon footprint?

Why it is important to prioritize home-made and local products and foods?

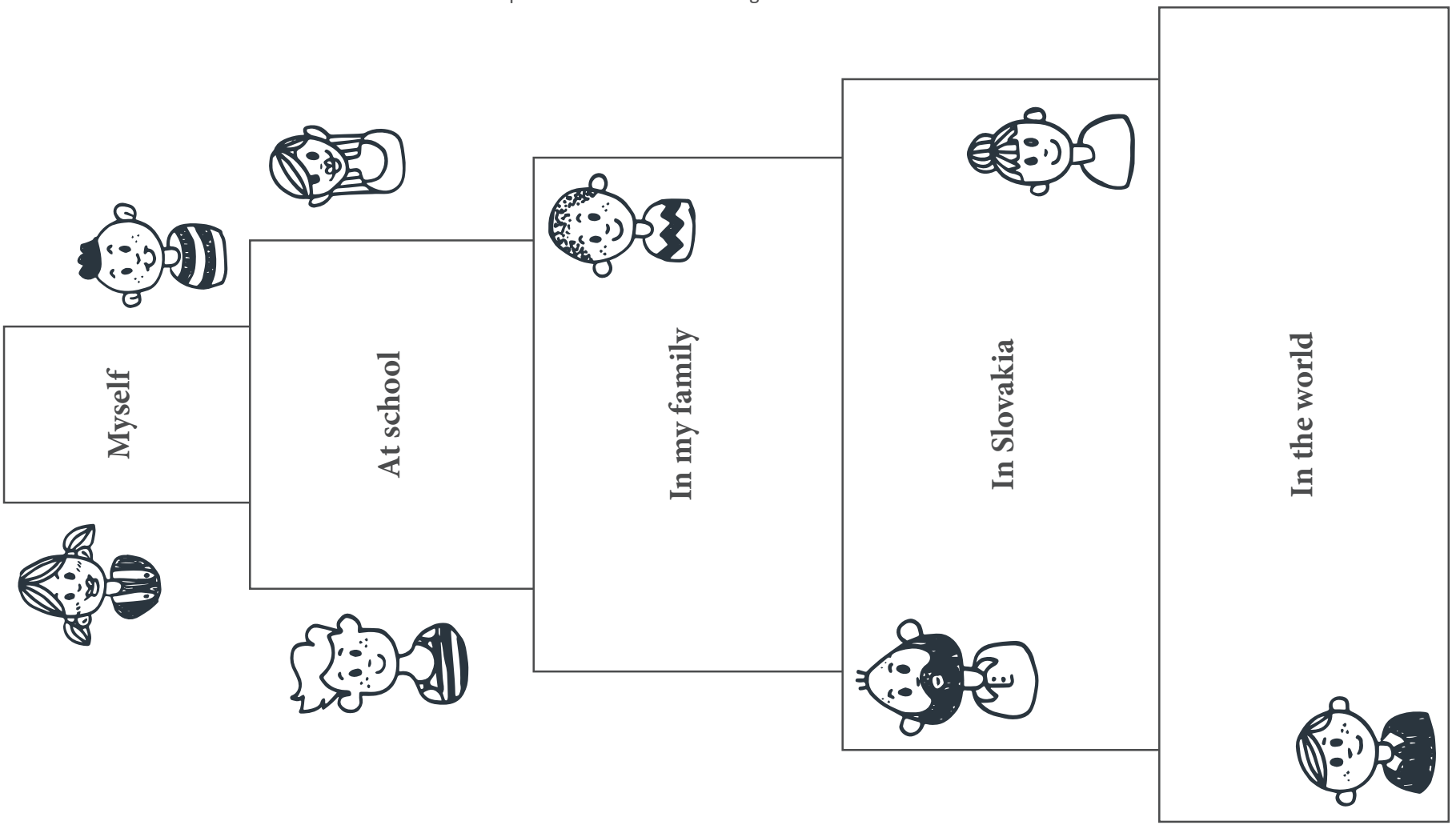
Banana Journey



Source: http://abullseyeview.s3.amazonaws.com/wp-content/uploads/abv_banana-journey.jpg

Searching for the Way

Consider what we can do at different levels to reduce the impact of food on climate change:



Change-making Menu

OBJECTIVES:

- Be aware of the factors that affect the carbon footprint of food.
- Be able to look for solutions and be responsible with nutrition.

THINK & FEEL

(Evocation)

Play the Carbon Footprint video from the Free Food to find answers to the following questions: An adult consumes around 1-1.5kg of food per day. Where does all our food come from? What was it made of and how did it end up on store shelves or our plates? What happens to uneaten leftovers or food after the warranty expires? How is the food system related to greenhouse gas production and the climate crisis?

Then ask students to examine the data on the **Food Charts** sheet (in the Handouts). What conclusions did they come to, and what information were they interested in? You can test your insights and knowledge in the **Nutrition and Climate Change** quiz. For more information about the graphics and answers to the quiz questions, see the **Explanations** worksheet.

KNOW & EXPLORE

(Awareness)

At the beginning, ask the research question: "Which diet has the least influence on climate change?" and state your hypothesis. Divide the class into three groups: 1. Vegan, 2. Vegetarian, 3. Omnivore. The task of each group is to create a daily menu that represents their diet and to calculate its carbon footprint using an calculator. Within the group, the students can discuss the advantages and disadvantages of a certain lifestyle from different angles and perspectives (health, finance, climate change) and formulate their conclusions and opinions. You can treat the topic as a project or as an essay.

Eventually, the groups present their research and have a constructive discussion with each other. Was the hypothesis confirmed? What are your shared conclusions? Which diet has the most benefits? Then, confuse the students with another type of boarder. The so-called local eater. What does it mean and what impact does it have on climate change?

ACT & CHANGE

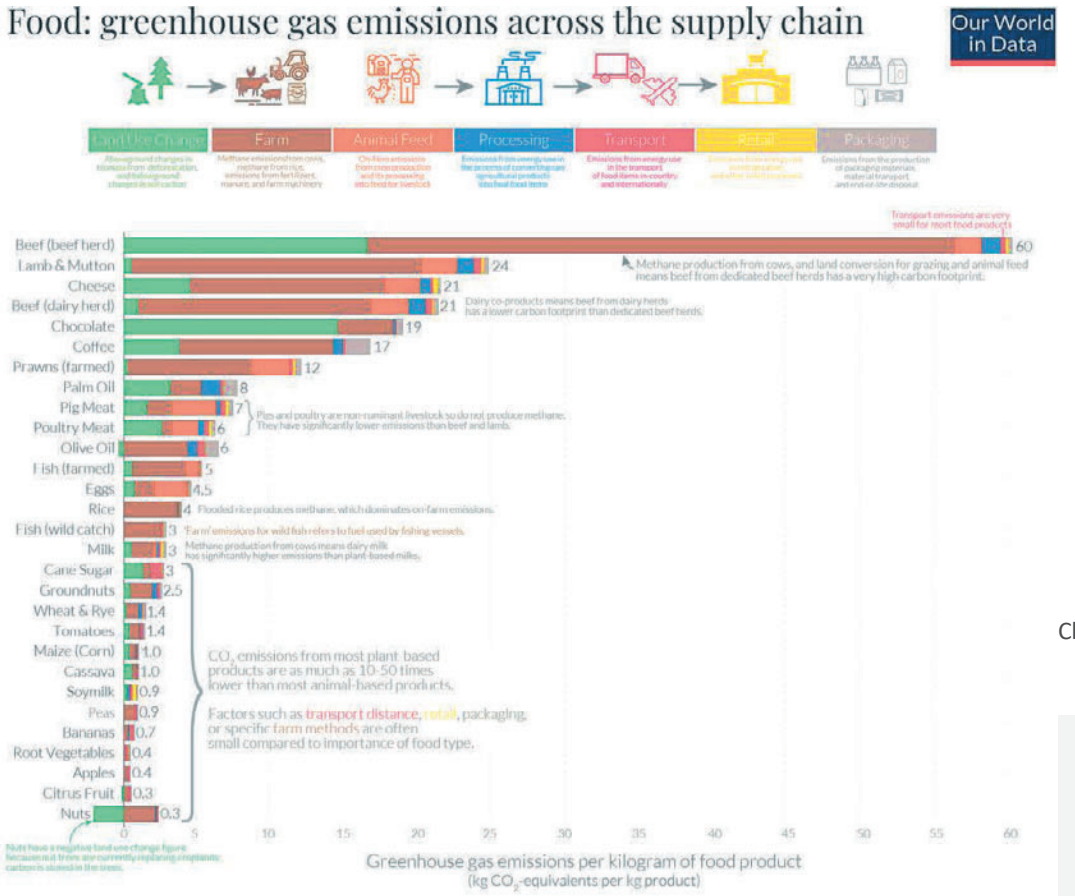
(Reflection)

Ask the students to suggest their own solutions or commitments to reduce the impact of food on climate change and try to apply these to their diet (*e.g. a day without meat, a day without semi-finished products, a local food day, a day without palm oil, a seasonal day, a day of cooking from leftovers*). After the allotted time has elapsed, return to this topic and discuss the following: How do you fulfil this obligation? What problems did you encounter?

Design your own green food code and your weekly "Change-making Menu" together for a week, taking the established principles into account.

Handouts

Chart no. 1



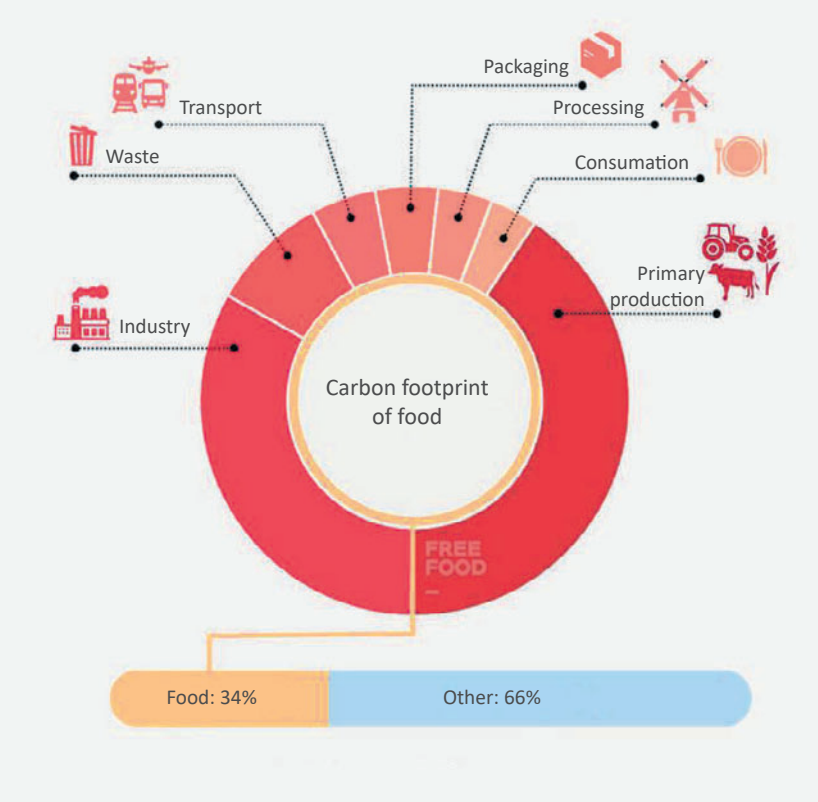
Source: Joseph Poore a Thomas Nemecek (2018).

Chart no. 2

Source: https://free-food.sk/

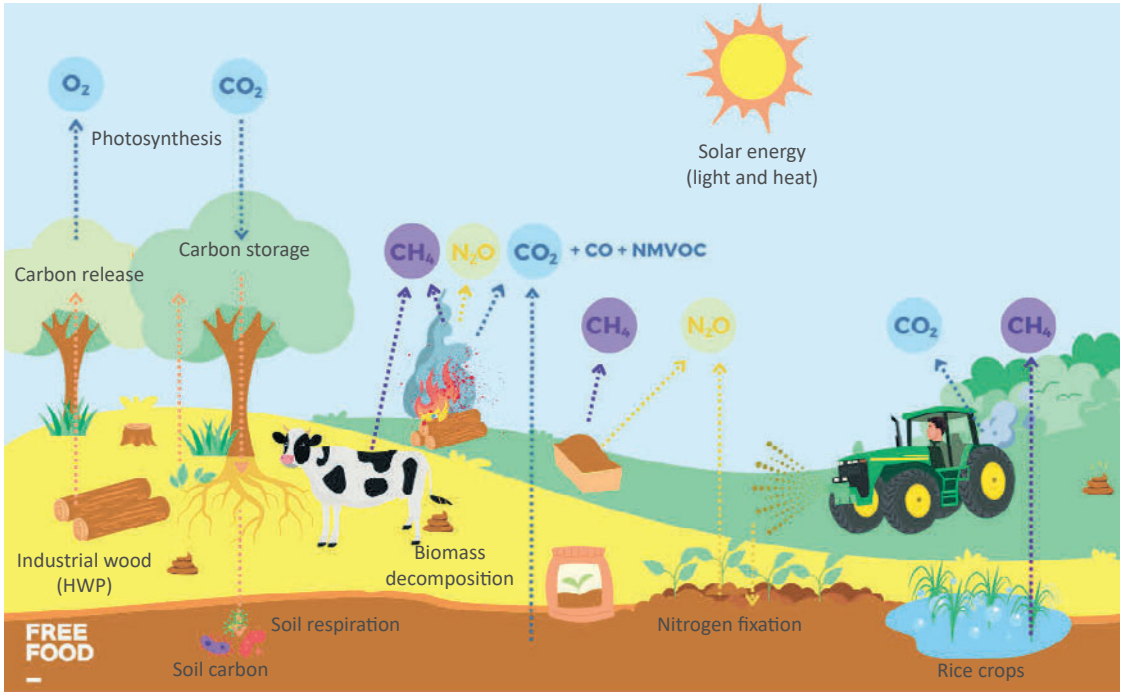
Hangouts

Chart no. 3

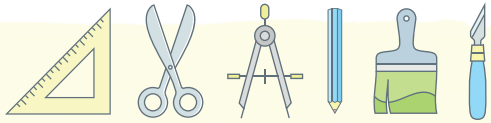


Source: https://free-food.sk/

Chart no. 4



Zdroj: https://free-food.sk/



Food and climate change

Test your knowledge with a short quiz or use the Internet for help:

1. What do you think has a greater impact on the carbon footprint of our diet?

a) what we eat
b) where our food comes from

2.Could limiting meat be an important step for climate change? Give reasons for your opinion.

truth or lie

3.Could school cafeteria meat be linked to rainforest decline? Give reasons for your opinion.

truth or lie

4.Name three differences between conventional and organic animal husbandry.

5.What do the numbers 0, 1, 2, and 3 on eggs mean?

6.Which three greenhouse gases do you know?

7.What could be the source of methane?

8.Which three foods have the largest carbon footprint?

9.At which stage of the supply chain is the most food wasted?

10. At which stage of the supply chain do the most greenhouse gas emissions occur?

Explanations

Chart no. 1:
Food production is responsible for aquarter of all greenhouse gas emissions, which contribute to climate change. However, every food has a different emissions footprint. The chart shows the greenhouse gas emissions caused by one kilogram of each food product. It includes all emissions that occur on the farm, in the factory, on the road, in the shop and in your home.
Meat, cheese and eggs have the largest carbon footprint. The production of red meat (beef, pork and lamb) and dairy products together accounts for almost half of the greenhouse gas emissions associated with the production, processing, distribution and sale of food. Fruits, vegetables, beans and nuts have a much smaller carbon footprint. Reducing meat consumption therefore has a major impact on each personal carbon footprint.
Chart no. 2:
Food is wasted throughout the entire supply chain in every single country, from initial agricultural production to final household consumption. The figure shows, in percentage terms, how much is wasted in the food chain in Europe.
Chart no. 3:
The food system is both, the biggest driver of the climate crisis and its biggest victim.
The food system is responsible for 35% of all greenhouse gases caused by human activities, with agriculture alone producing 24-30% (that's about the same as the production of electricity and heat). The largest source of greenhouse gases is deforestation, followed by primary production, particularly livestock production, and then manufacturing.
Chart no. 4:
Nitrogen is the main component of fertilizers and, together with phosphorus and potassium, is one of the basic elements for plant nutrition. Improper application of fertilizers or the use of artificial fertilizers means that nitrogen is not sufficiently bound in the soil and ends up in the air, where it combines with oxygen to form N_2O or nitrous oxide, which we also call laughing gas. This greenhouse gas is almost 300 times more harmful than CO_2.
Cow manure or pig manure is also a significant source of methane CH_4, which is 28 times more effective at storing heat than CO_2 (up to 80 times more in a 10-year horizon). As a gas, CH_4 dominates the process of putrefaction, especially in the decomposition of living matter without access to air. We call this process anaerobic fermentation. It also occurs in rice cultivation when the living substance partially decomposes in the fields flooded with water. It's practically the same process as fermenting cabbage. Rice cultivation is therefore a significant source of methane, with the same carbon footprint as total global household consumption. In herbivores, we distinguish another fermentation process that we call enteric fermentation. The so-called enteric methane is one of the by-products of the digestive process, especially in ruminants (cows, goats, sheep) and is excreted from the body mainly through belching.

Source: Joseph Poore a Thomas Nemecek (2018); https://free-food.sk/

MAY

I CREATE ISLANDS OF LIFE

I Create Islands of Life

You need to know

Biological diversity – the biodiversity in Slovakia is characterized by a high number of plant and animal species due to the diverse habitats. So far, more than 11,200 plant species and more than 28,800 animal species have been described in our area. Despite the figures mentioned, we are faced with the fact that many species are declining from year to year (Barn swallow, Common poppy), and many are even disappearing completely (Cornflower, European pond turtle).

Changes in land use (e.g. deforestation, intensive agriculture, urbanization), the extraction of natural resources and raw materials, pollution and invasive species have also a major impacts on biodiversity. The existence of several species that were widespread until recently is threatened.

The loss of biodiversity is also closely linked to climate change. It is negatively influenced by an increase in the average air temperature, an increased number of summer days (above 25 ° C), a more frequent occurrence of heat waves, a decrease in relative humidity, variability in precipitation totals, the occurrence of heavy rain, extreme weather situations, and increased dust levels due to dryness etc. The above phenomena bring various negative consequences for biodiversity, such as a shift in vegetation zones and levels, a reduction in the resilience of ecosystems, damage to vegetation due to drought, a change in the living conditions of plants and animals, changes in the growth and body structure of species, the emergence of new diseases and pests, spread of invasive and alien species, changes in species interdependence (predator-prey, plant-pollinator relationships, symbiosis, isolation, loss of opportunities for migration, extinction of endangered species and spread of resistant species), changes in the geographical distribution of species affecting the most endangered and most narrowly specialized species (endemics and relics) and others.

Various adaptation measures serve to adapt to the consequences of climate change. By using them, we can make a significant contribution to promoting biodiversity and improving the climatic conditions in our immediate surroundings – on the school campus, in the garden or in the city park.

Depending on the type, adaptation measures are divided into: a) Grey ((structural nature, e.g. shading, use of reflective surfaces, permeable surfaces), b) Green (increasing the proportion of greenery, roof gardens, green walls), c) Blue (revitalization of water flows and wetlands, creation of rain gardens), d) Soft (change in population behaviour, warning systems, economic incentives). Source: Slovak strategy of adaptation to climate change, Ministry of the Environment, 2018.

Depending on the environment in which climate change adaptation and biodiversity promotion measures are applied, we can distinguish them into measures suitable for urbanized and non-urbanized environments (Source: Catalogue of selected adaptation and mitigation measures for the urbanized area):

Urbanized environment	Non-urbanized/rural environment
Planting solitary trees and small tree communities in public spaces with a local cooling effect	Planting of forest and non-forest vegetation
Construction of green areas within the block to ensure a good microclimate	Wetland construction, revitalization of existing wetlands and bogs
Building rain gardens	Collecting rainwater
Placing small insect houses	Building insect hotels
Establishing urban production/ community gardens with watering holes	Creating a meadow or a flower bed with meadow flowers
Building green roofs and green walls	Placement of drinking troughs or pots for birds and insects
Use of permeable surfaces	Planting of biocorridors, windbreaks, etc.
Keeping wild corners	Caring for trees in the landscape

Each of us is important. It is the individual who, through the implementation of practical activities, can support local biodiversity and influence the microclimate of his place of residence. These activities also include the creation of so-called Island of Life – elements to support biodiversity (creating meadows and grasslands, leaving "pieces of wilderness", insect hotels, bird and bat houses, canned and potted pest traps, bird and insect baths, animal shelters, dry stone walls, bird feeders) and also various voluntary activities (pruning, planting and treating trees, mowing meadows, creating organic belts on agricultural land).

Islands of Life can also be created from upcycled materials that are no longer needed in the home or on the farm. Animals and plants will thank you for your care with their presence, song, scent or beauty. Islands of Life can be built and set up not only in the garden but also on the school grounds and are ideal as practical teaching areas that can be used not only in natural science subjects.

More on this topic

Let Nature Inspire Us – a brochure with adaptation strategies, identifying the consequences of climate change on the social and natural environment, types of adaptation measures (grey, green, blue, soft),

Ministry of the Environment of the Slovak Republic – pages with useful links on the topic of biodiversity in cities and towns,

National Biodiversity Protection Strategy in Slovakia – a document describing the state of biodiversity in Slovakia, goals and measures for its protection, vision until 2050,

Islands of Life – instructions for creating various elements to support biodiversity,

PlantNet – Plant Identification – an online application for plant identification,

Educational Games – brief information and explanation of the concept of biodiversity,

Natural Garden – a map of natural gardens in Slovakia,

State Nature Conservancy of the Slovak Republic – information on the Convention on Biological Diversity,

Let's Create a Meadow Together – instructions for creating a biodiversity meadow,

52 Tips for Protecting Biodiversity – a booklet about what each of us can do to protect biodiversity

Let's go!

2030 Climate Target

Stop biodiversity loss: By 2030, at least 15% of damaged ecosystems in Slovakia will be restored, in cooperation with owners and users, a wetland restoration program will be implemented, and the protection and restoration of forests, meadows and pastures that represent ecosystems with the highest biodiversity are being improved (Environmental Strategy 2030).

What's the hold-up?

We humans often have the feeling that we cannot solve global problems on our own, but that they only lie on the shoulders of governments and non-governmental organizations. Biodiversity loss is one such problem, but it affects everyone directly. It is therefore necessary to raise awareness of how biodiversity is specifically related to our lives and how we can practically contribute to its protection – on our balconies, in gardens, schools and workplaces, villages and cities.

THE CHALLENGE:

Spa for Sparrows

Let the feathered inhabitants of your garden be pleased and treated to a refreshing bath. By building such an island of life, you offer the sparrows in your garden a watering hole and a swimming pool in one.

1. Build a bath for sparrows and other birds. Be inspired by the instructions on the internet.
2. Place the bath in the garden, on the balcony or in front of the house in an elevated place.
3. Don't forget to add water regularly and check its cleanliness.
4. Send us a photo of your spa and a short message about its visitors on ewobox.

Photo: Lilla Szabóová, Lúka v areáli SEV Dropie, 2021

Eco-researcher

OBJECTIVES:

- The ability to make direct contact with the natural environment.
- Sensitivity and respect for nature.

THINK & FEEL

(Evocation)

Watch the short video Meadow Flowers. Talk to the children about which flowers appear in it and which ones they know. Which ones are medicinal? What can you make from dandelion flowers? Attend a honey tasting at a local supplier or beekeeper.

Have a picnic in the school garden. Get to know the flowering plants and herbs growing right under your nose. Make "fragrant cocktails". Each child collects in paper cups a small amount of flowers and other natural substances (moist bark, pieces of wood, soil, cones, grass, sand) that have a scent or a some smell. The children then smell the individual glasses with their eyes closed and guess the composition of the cocktails.

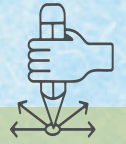
KNOW & EXPLORE

(Awareness)

Plan a trip to a meadow (to a nearby park or natural garden). Prepare observation glasses with a magnifying glass, material for marking the observed area (wooden stakes, twine), atlases of plants and animals, and drawing aids.

Mark a 1m x 1m space at the selected location and play explorer. The children's task is to observe life on this piece of land up close and count how many plants and animals of the same species live there. To record this, you can use the **Life on the Meadow** worksheet from the Handouts. Try to capture carefully small insects in the prepared jars and observe them with a magnifying glass. Children can try to find the plants and animals they observe in picture atlases. The discovered microworld and the stories that take place in the grass can be painted on the drawing.

You can also play explorer in kindergarten area. Repeat the same process – mark the observation area and find out how many different species of plants and animals live there. Use the **Life in the Schoolyard** worksheet to record the observations.



ACT & CHANGE

(Reflection)

Compare the results of your research. In which place did more plant species grow and more animal species lived – in the meadow or in the schoolyard? Why is it so? (*The more colourful the environment, the more colourful the life in it.*)

Ask the children what they would suggest to bring more "life" to their schoolyard. Start by planting or sowing flowers in pots. Carry out the planting together with the children or their parents. Anyone can bring a transplant from their own garden or seeds of annual plants. Think about where you will place them – do they need a lot of sun or, on the contrary, shade? Agree on how you will care for them. Observe which animals are attracted to the flowers in your school garden.

Continue to increase biodiversity. Make Flower Bombs, create a biodiversity meadow in spring, create a perennial pollinator bed, create a herb spiral, and create unmown strips of green.

Life on the Meadow

Draw what lives in the meadow. For each species, mark how often you found it in the marked area.

Life in the Schoolyard

Draw what lives in your school garden. For each species, mark how often you found it in the marked area.

Time Traveller

OBJECTIVES:

- Knowledge of the local landscape and its uniqueness.
- Respect for the diversity and variety of nature.

THINK & FEEL

(Evocation)

Prepare the **Meadow Plants and Medicinal Herbs** worksheet from the Handouts as well as picture keys or atlases for identification for the students. Their task is to find the individual species and draw a picture of it or describe the plant. At the same time, they should circle the green plus symbol – if it has medicinal effects, or bees – if it attracts various pollinators (bees, wasps, bumblebees, butterflies, beetles).

Then have students print the images from the **Pollinator** worksheet or display them on the interactive whiteboard. Together, try to match the insect species to the plants which they pollinate, from the previous task. You can find the **Clue** for both worksheets in the Handouts.

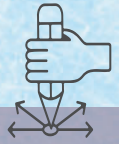
KNOW & EXPLORE

(Awareness)

Identify which of these plants and their pollinators students have already seen in their natural environment and record the number. Then ask students to ask their parents and grandparents the same question. Compare values between generations and consider the question: Why do we see fewer plants and animals in nature today than in the days of our grandmothers and grandfathers?

Find out what small animals live in your schoolyard. For humane trapping, make traps from jam jars according to the **Trap in a Jar** instructions and illustrative image from the Handouts. Set up at least three traps in three different locations in the schoolyard - e.g. unmown area, ornamental flower bed, and mown lawn. You can also put bait (a piece of apple, or dry bread) in the jars.

Catch and observe for two days. Track how many animal species are trapped in different habitats throughout the day. At the beginning, you can pose a research question and hypothesis, and at the end you will find out whether your assumptions are met. Have your expectations been confirmed? In which parts of the schoolyard did you catch the most animals? What does that mean? What affects biodiversity and how can you support it?



ACT & CHANGE

(Reflection)

Check the knowledge you have acquired so far in the form of the game “Guess what I think?” One student thinks about any plant you have studied. The other one tries to guess its name by asking YES or NO questions (e.g. Is this plant big? Is it red?)

Visit a natural garden near your living area. You can find their overview, address and contact information on the online map . During the walk, concentrate on the diversity of plant and animal species in the garden and compare this with the diversity of species in your schoolyard. Count all species if possible. Take a poll about the most beautiful, fragrant or useful plant.

Meadow Plants and Medicinal Herbs

Search for these plants in the atlas, draw a picture, or write notes. Which of these plants are medicinal plants and which attract pollinators? Circle the correct symbol.

Name of the plant	Appearance (drawing or description)
Common poppy 	
Brown knapweed 	
Ribwort plantain 	
German chamomile 	

Name of the plant	Appearance (drawing or description)
Rampion bellflower 	
Corncockle 	
Red Clover 	
Meadow sage 	
Yarrow 	

Name of the plant	Appearance (drawing or description)
Pot marigold 	
Common daisy 	
Wood Forget-me-not 	
Common Dandelion 	

Pollinators

Small tortoiseshell

Bumblebee

Seven-spot ladybird

European earwig

Western honey bee

Source: https://www.veselodoma.sk/babocka-prhlavova-otuzilec/
https://www.ephoto.sk/fotogaleria/fotografie/217316/cmeliak/?s=critics
https://laborartorium.com/sk/lienka-sedembodkova/
https://www.zahrada.sk/magazine/ucholaky-skodce-ci-pomocnici
https://www.nahuby.sk/obrazok_detail.php?obrazok_id=128348

Clue

PLANTS

Common poppy – has a calming effect on coughs, part of herbal mixtures,

Brown knapweed – an ornamental and medicinal plant, supports the immune system, accelerates the healing of eye infections, supports digestion, relieves skin problems,

Ribwort plantain – reduces coughing, stops bleeding and helps with wound healing, has a detoxifying effect,

German chamomile – has anti-inflammatory, disinfectant and calming effects,

Rampion bellflower – has an anti-inflammatory and pain-relieving effect,

Red clover – has an antispasmodic and diuretic effect, supports digestion,

Meadow sage – effective for sore throats and tonsillitis, reduces sweating, has a disinfectant effect,

Corncockle – an ornamental plant, has poisonous effects,

Yarrow – has anti-inflammatory and healing effects,

Pot marigold – has an anti-inflammatory and antibiotic effect,

Common daisy – is used to treat wounds, abrasions, bruises, burns, eczema, rheumatism, muscle pain,

Wood forget-me-not – it used to be used to treat skin problems, today it is used to stop bleeding, treat psoriasis and support the heart's activity,

Common dandelion – is used for inflammation of the urinary tract and has a positive effect on the digestive system

Foto: Lilla Szabóová, SEV Dropie

POLLINATORS

Small tortoiseshell – likes nettles, asters, phlox, Butterfly bush, lavender, stonecrop, valerians, oregano, knautia, vervain, echinacea, almost all of the above plants that contain pollen and nectar (except corncockle),

Bumblebee – likes perennials, e.g. echinacea and lavender, also clover, apple trees, pears, cirisium,

Seven-spot ladybird – likes grasses and plants, or fruit trees and bushes, that are infested with aphids (one ladybug eats up to 150 aphids per day),

Western honey bee – likes asters, dahlias, echinacea, spurge, hellebores, Grape hyacinth, wallflower, Winter aconite, honeysuckle, lavender, almost all of the above plants that contain pollen and nectar,

European earwig – likes fruit trees infested with aphids (it feeds not only on aphids but also on the fruits themselves), hiding and surviving in dry places, in various cracks, holes, under stacked wood or on window sills heated by the sun

Bug Jar

To monitor biodiversity in different environments, you can make animal traps out of mason jars like this:

1. Bury a jar in the ground so that its edge is level with the surrounding terrain.
2. Place two or three branches on the jar so that the lid of the jar cannot close completely.
3. Place the lid on top and cover it with a layer of twigs, leaves, moss or grass.

Photo: Lilla Szabóová, Meadow in the SEV Dropie area

Swaper

OBJECTIVES:

- Explain the concept of biodiversity and its differences in urban and rural areas.
- Increase biodiversity in your area with selected measures.

THINK & FEEL

(Evocation)

Ask the students to think for a moment and write on a piece of paper at least two qualities about themselves that set them apart and make them special. Collect the papers and read them one by one. The students are to guess who is being described.

Talk to each other about how different we are as humans and what we have in common. What do we have in common with other species living on the planet? Do they know how many plant and animal species are in Slovakia or around the world? (*Slovakia – 11,000/28,000, the world – 8.7 million plants and animals*)

KNOW & EXPLORE

(Awareness)

Talk about the importance of biodiversity and what threatens it the most today. Look for connections to climate change. Explain what adaptation measures are and which ones support biodiversity.

Play the Four Corners activity. Divide the students into four groups. Place a large sheet of paper and a marker in each corner of the classroom. The task of the groups is to brainstorm on a different topic in each corner: 1. Promoting biodiversity on the school grounds, 2. Promoting biodiversity on the balcony/terrace, 3. Promoting biodiversity in the garden, and 4. Promoting biodiversity in the city/municipality. After the drafts are written in the allotted time, they move on to the next corner. They will study what has already been written on the topic and add their own ideas. The groups rotate until they end up at their original corner and present all ideas to their classmates.

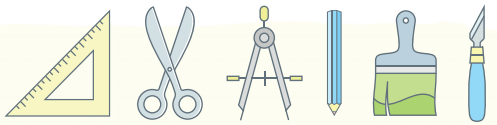
KONAJ A MEŇ

(Reflection)

Have the students fill out the **In the City and in Country** worksheet and work together to identify the differences in biodiversity based on specific locations. Then discuss the possibilities of increasing biodiversity in the schoolyard. The students' task is to be inspired by the Islands of Life and to suggest appropriate adaptation measures for school grounds. Selected "islands" can be constructed, placed and supervised during tech class.

Organize a flower swap at school. Transplant overgrown plants and flowers from your own garden into pots and swap them for species you don't have yet. Students can create a passport for each plant with basic information (e.g., name, blooming time, pruning time, water, sun, and nutrient needs). Invite an expert to the event who will teach you interesting facts about the plant world and how to care for specific species.

Did you know that the plants you buy really need to have a passport? Have the students search the Internet for information and learn more.



In the City and the Country

Compare the state of biodiversity in your region. Select specific locations and suggest suitable adaptation measures to climate change and at the same time for increasing biodiversity.

Location	Current status	Suggested measures
In the city:		
In the country:		

Volunteer

OBJECTIVES:

- Describe the effects of climate change on human life and various ecosystems.
- Work on school and community projects aimed at adapting to climate change.

High school

THINK & FEEL

(Evocation)

Present the students with the following situation: What would happen if bees suddenly became extinct all over the world? Let them develop and discuss this idea. Then divide them into groups and give them the **Life without...** worksheet. Their task will be to compile the order of importance of various components of the environment that we often take for granted in everyday life.

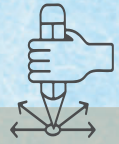
Each group presents its ranking and explains it to the others. Which things are the most important? Which are exhaustible, which are irreplaceable and why? Discuss what would happen if some of these disappeared completely from our lives. What would happen if humans suddenly disappeared? Recommend the book The World Without Us by Alan Weisman.

KNOW & EXPLORE

(Awareness)

Assign the students to develop a concept map on climate change and biodiversity. They can work in groups and address the specific impacts of climate change on: 1. Coral reefs, 2. Rainforests, 3. Nordic coniferous forests (Taiga), and 4. Biodiversity in Slovakia. They can use different sources of information to edit the maps and include specific examples of plant and animal species affected by climate change in the area or ecosystem.

Then they present their maps to their classmates. You can find a summary of the results in the Tipping Points – Ecosystems infographic or in the short film: Climate Change – Forests.



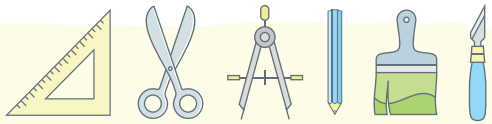
ACT & CHANGE

(Reflection)

Take the students for a walk around the school grounds. Task them with completing a SWOT analysis – the strengths and weaknesses of the school grounds in the context of biodiversity. Also, identify opportunities (ideas to support biodiversity) but also potential threats. Agree on what elements or actions you will implement. Motivate the students to develop a project plan and support them in implementing it.

The publication Stories from the Meadow Land offers you inspiring volunteer activities to support biodiversity. The Roots & Shoots high school programme provides mentorship in creating community projects. You can receive financial support for implementation, for example, through the Green Education Fund, Enviroprojekt funding or crowdfunding portals such as StartLab.

But sometimes you don't need a big budget and huge project administration. Sometimes all it takes is a handful of students and volunteers who use their technical, artistic, organizational or communication skills for the right cause.



Life without...

Rank each component (components) of the environment based on how they impact your daily life (Level 1 - least important, 10 - most important).
Think about what would happen if this normal part of our lives suddenly disappeared (extinct or depleted). What would be the consequences?

Components	Level of importance	Consequences of disappearance
Bacteria and viruses		
Soil microorganisms (decomposers, my-corrhizal fungi)		
Fish		
Bees		
Chlorophyll		
Plants		
Predators		
Water cycle		
Gulf Stream		
Oil		
Precious metals		
Salt		

JUNE

I WILL ENJOY TODAY

I Will Enjoy Today

You need to know

We live in a fast and consumerist world characterized by overconsumption in almost everything. Let's go back a few years and remember remember what life was like during the Coronavirus crisis.

COVID-19 has slowed us down and shown us that we need much less to live than we previously thought (health, family, basic requirements to survive in isolation). It brought hope that the world will no longer be the same as before. The desire for us as humanity to realize the true essence of existence and reduce consumer pressure on natural resources and ecosystems. However, shortly after the pandemic, we can see that the opposite is the case. The wheel spun even faster as if trying to make up for the lost time.

Climate change is such a frequently mentioned word thrown around so much these days that we no longer think about it. And maybe that's why we miss those important connections. One Slovak citizen causes an annual emissions of around 6.5 tons of CO_2 (Source: article). We've talked in the previous topics and over the past few months about what makes up our carbon footprints. We know every decision we make during the day is important - how we turn on the lights, heat, eat, transport or shop. Now it is time for fun.

Did you know that we can also help reduce climate change through the way we spend our free time? Did you know that one minute of talking on the phone has a carbon footprint of about 57 grams (Source: Article)? Did you know that the payment amount and the type of merchant influence the size of the carbon footprint when shopping online with a card? (Source: www.premodruplanetu.sk) Did you know that a purchase of clothing worth €50 also has a value of 57kg CO_2 (the equivalent of driving 229km in a petrol car)? Did you know that the carbon footprint of a printed book is on average 7.5kg CO_2? Do you know what can reduce the carbon footprint of your reading? (Source: Books or e-books) As with reading, moderation is important in other leisure activities and our consumer behaviour. Let's not forget that there are already 8 billion of us who want to enjoy life on this Earth.

Different applications and calculators can help us get a better overview of the carbon footprint we leave throughout the day. They can estimate the footprint of our purchases in groceries, restaurants or gas stations. **It's important to understand the importance of your everyday consumer decisions. We recognize different brands and values, for example** on food packaging (nutrition values, Nutri-Score - a traffic light system for healthier foods), which help us make the right decision. Establishing a similar system to label the carbon footprint of products and services is even more important in the context of the climate crisis. It would enable the customer to make the right shopping decisions not only for their livelihood but also for their entertainment and leisure.

195 countries have already joined the Paris Agreement, which requires every country, including Slovakia, to reduce greenhouse gas emissions. In the second half of the century, we should achieve a so-called carbon neutrality, a state in which we only release as many emissions as the natural systems can absorb. This change in our economy and society is already taking place, albeit at a very slow pace. However, if we mobilize as humanity and everyone does their part, we have a chance for a future. A future in which we know four seasons. **In winter we will have snowball fights and in summer we will enjoy spending time in the sun.**

More on this topic:

Black Swan – OZ Živica's online magazine containing new views, topics and opinions on ecology and environmental protection

EkoRestart – practical examples of how you can reduce your carbon footprint

Greenpeace Czech Republic – information video on climate change

Institute for Environmental Policy – carbon footprint calculator

25 Trick – an article on forbes.sk aimed at reducing the carbon footprint every day and for each of us

Let's go!

2030 Climate Target

Increased support for the circular economy through eco-design or waste prevention (Low-Carbon Development Strategy of the Slovak Republic until 2030 with a View to 2050). Increase the use of exhibition and museum spaces, open-air museums and cultural and natural heritage objects (Environmental Strategy 2030).

What's the hold-up?

We live in a time of unlimited possibilities in all areas of our lives, including leisure time. We like to spend our time on the phone, chatting, playing electronic games, posting on social networks, shopping online or in shopping centres, in the cinema with popcorn and a drink with a straw, or in slippers in front of the TV. We see friends and loved ones online more often than in person. We often only give each other gifts virtually – by bank transfer to an account or by email with a gift voucher. This chapter of our lifestyle is also linked to climate change. Again, we can make a small change with a big impact on our family, friends and the planet.

THE CHALLENGE:
Enjoying Eco Today

You have successfully reached the final challenge of the campaign. It's time to celebrate. How? In an eco-friendly way, of course. Enjoy your free time in a different, original way and with respect for the climate. Treat yourself to a new experience and be an inspiration to those around you.

1. Set aside a day or weekend to enjoy in an eco-friendly way. Show others that you can celebrate without an unnecessary carbon footprint.
2. What can you enjoy on this day? There are no limits to your imagination, so let it run wild. Do something different and unusual.

(e.g.: Plan your route home through a beautiful part of the city or surrounding area, do not turn on the television, turn off your cell phone, make your own gifts or cosmetics, visit a beautiful natural or cultural place, or avoid shopping centres).

3. Share your experience on ewobox.sk

Envirospektrum, Olívia Sotáková, Friends

When the Weather Goes Crazy

OBJECTIVES:

- Know the phenomena associated with climate change.
- Distinguish activities related to different seasons.

THINK & FEEL

(Evocation)

Give each child the **What I Like to Do** playing card from the Handouts and five tokens (pebbles or figures). Print out an extra card, cut it into individual images, and put it in a dark bag. The children's task is to place their pieces in the spaces of the playing card according to the activities they like to do. Draw pictures from the bag one after the other and describe them together. Each time, the children take a token from the picture which was drawn. The winner is the one who has no tokes on the playing card and calls BINGO.

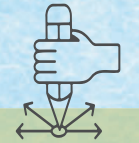
After completing the game, talk to each other about the questions: Can you imagine a winter without snow, without snowball fights, without skiing? And how about a summer without swimming or ice cream? What would happen if the fruit trees didn't bloom in spring?

KNOW & EXPLORE

(Awareness)

On the carpet, prepare four piles of things related to the seasons. These can be various characteristic items (e.g. summer: swimsuit, shorts, tank top, sunglasses, fan, sandals, summer fruits). However, place an item on each pile that does not belong to that season (summer: hat or gloves). Divide the children into groups, one for each pile. Their task is to guess what season the objects belong to and figure out what doesn't belong there and why. The groups will present their findings to others.

Show the children the pictures from the **Crazy Weather** worksheet from the Handouts. Explain to them that sometimes the weather is a little “crazy”. It can suddenly snow in places we wouldn't expect, and where it should be cold, it is very warm. Have the kids experienced any crazy weather?



ACT & CHANGE

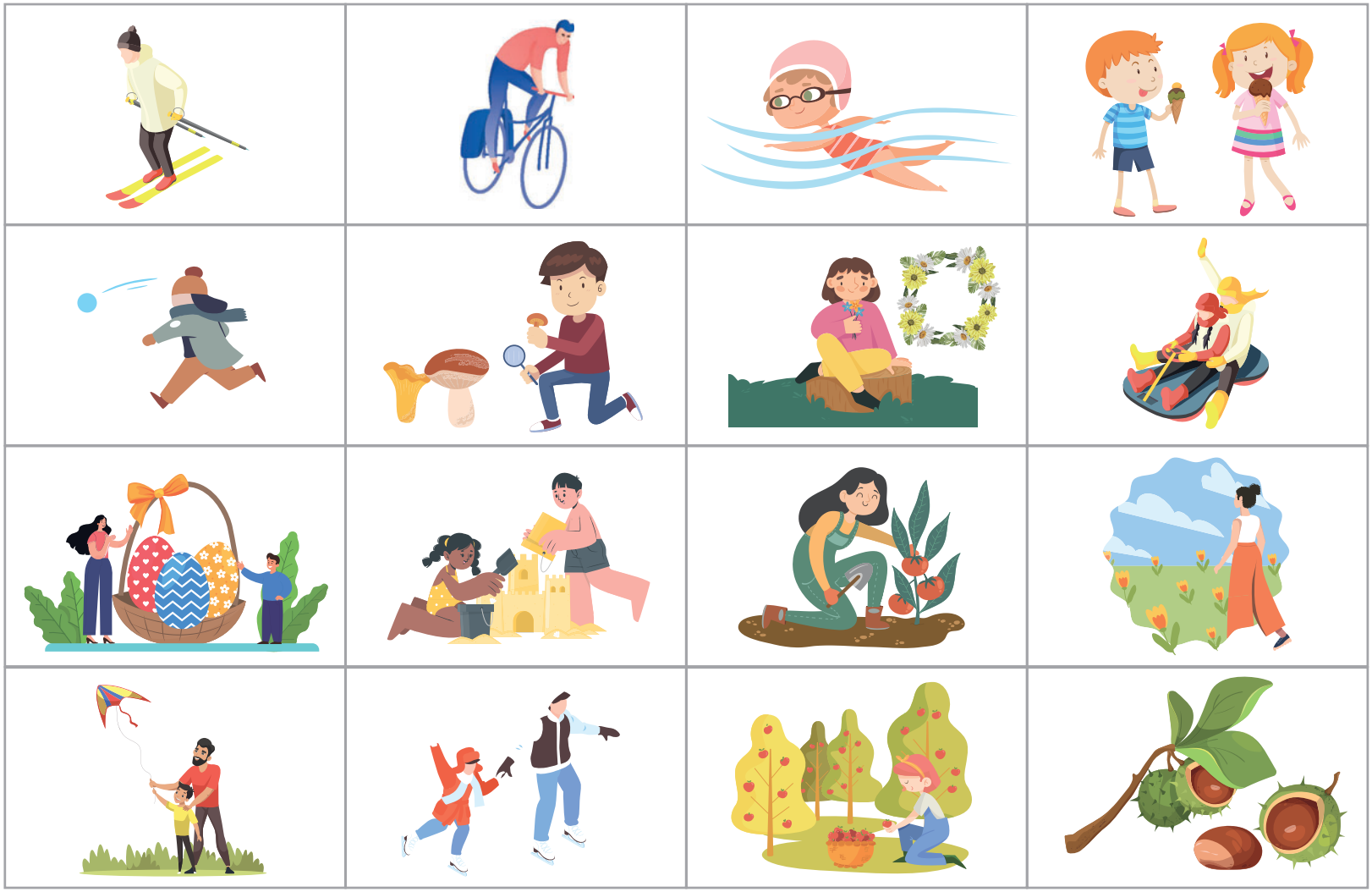
(Reflection)

Have a crazy day in your kindergarten. Try dressing like it's a different season outside on one day. Talk about how the kids felt and what nature might be experiencing when it faces the crazy weather.

Give the children a small parallel. If we don't dress for the weather, we can get sick. Likewise, crazy weather can make nature sick. How could it get sick? How would children care for nature so that it doesn't get sick? For example, create an accordion picture book from shared designs. Put some of them into practice.

What I Like to Do

Which of these activities do you enjoy the most?



Crazy Weather

Source: https://mymodernmet.com/snow-in-arizona/

Source: https://www.businessinsider.com/melting-glaciers-ice-sheets-sea-level-rise-climate-disaster-2022-12

Responsible for the Climate

OBJECTIVES:

- Be aware of lifestyle differences and their impact on the environment.
- Avoid trash creation when shopping.

THINK & FEEL

(Evocation)

Project the pictures from the **Children of the World** worksheet from the Handouts onto the board and read their stories. Tell the students to choose one of them and try to compare their lives. Discuss these and similar questions: What do you think about the story? What makes your rooms different? What dreams does the child from the story have? What dreams do you have? Would you like to be in his shoes?

Find the countries the children come from on the map. Explain to the students that not all children have the same living conditions. Some live in better conditions, others in worse, with the climate also playing an important role. The 2021 UNICEF report Climate-Changed Child states that 1 billion children are at extremely high risk precisely because of climate change.

KNOW & EXPLORE

(Awareness)

Have students complete the **Opposites** worksheet (in the Handouts). Their task will be to connect the images so that they form lifestyle opposites. Discuss together which of the pairs is more environmentally friendly and why.

Then try to classify each image into thematic categories that relate to our lives (housing, food, transportation, shopping, leisure, etc.). Discuss which of the two images best describes them and what they would like to change or improve. Brainstorm your ideas: What can we do in each category to live more ecologically?

ACT & CHANGE

(Reflection)

Focus on an essential part of our lives – shopping. Do a little class quiz about shopping. Consider questions like: Do you like shopping? Which store do you like the most? What do you notice in the store? What do you enjoy most about shopping? How do you choose toys/food/clothes? What do you pack your new items into? How are the items packaged in stores? What happens to these packages after they are opened?

Watch with the students the video about zero waste shopping by influencer Danka. Explain the concept of zero waste, recap what you saw, and add your own tips. Go to the store and look for examples from the video, but also apply new ideas from the students.

Give students the **Eco Bags** worksheet from the Handouts. Their task will be to draw how they pack their shopping in an ecological way and apply the principles to minimize waste like Danka. Evaluate the activity together.

Children of the World

Everett, 4, USA – America

Everett lives in Michigan, USA, with his parents, who are collectors of antiques, art and watches. He has his own collection of hundreds of Spider-Man toys. When Everett grows up, he wants to work at Marvel creating superheroes, or become a firefighter.

Gantulga, 11, Mongolia – Asia

Gantulga's family are nomadic reindeer herders in Mongolia. They have more than 200 animals and belong to a community that take great care of their reindeer. Gantulga goes to school from 9 a.m. to 2 p.m. and has lessons in Mongolian, English and maths. In the summer, he accompanies men and older boys to the taiga forest, to find greener pastures for the reindeer. They live in a tipi, which can be draughty, but at night the floor is covered with sheepskins to sleep on. There is a solar panel that powers his smartphone. When he grows up he would like to be a reindeer herder, but his father fears he may want to move to the city.

Maria, 15, Italy – Europe

Maria lives an hour from Venice in a large house built by her grandfather. It is shared by her immediate family, her grandmother and her aunt. Maria is a dedicated climate activist and belongs to the organization Fridays for Future, a youth-led movement formed after Greta Thunberg's protest outside the Swedish parliament. Maria's fears for the future of the planet have intensified to the extent that her mother has become concerned for her mental health.

Children of the World

Daniel, 7, Romania – Europe

Daniel lives in Maramureș, Romania. They have two houses: one is a traditional village house with a watermill for processing wool, and the other is more modern. In summer, he sleeps at the old house, but it becomes too cold in winter so the family move into the adjacent modern house. They are self-sufficient, only purchasing oil, sugar and occasionally biscuits from the shop; they keep four pigs, two rabbits, four chickens, a goat and a horse to provide food for the family. Daniel travels to school by bus, and is not really interested in upholding local traditions.

Rayhan, 3, Ghana – Africa

Rayhan lives with his parents and baby brother in Accra, Ghana. Two housemaids also live with them. A high wall topped with barbed wire surrounds the property, and in the living room there is a pond, filled with goldfish, under a glass floor that people can walk over. Other rooms include a gymnasium, a bar and a cinema. Rayhan has his own bedroom, with a bed shaped like a Jeep, reflecting his love of cars. However, he prefers to sleep with his parents and only uses his bedroom for playing.

Source: https://www.theguardian.com/lifeandstyle/2023/aug/19/childrens-bedrooms-around-the-world-james-mollison-photographs

Opposites

Connect the images of the classic way of life with its more ecological variant.



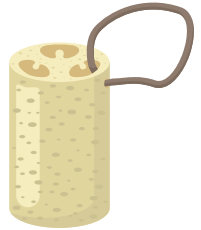






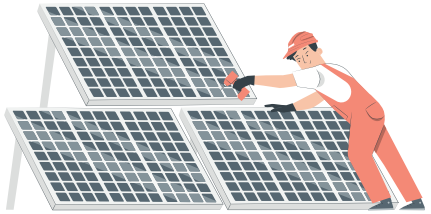




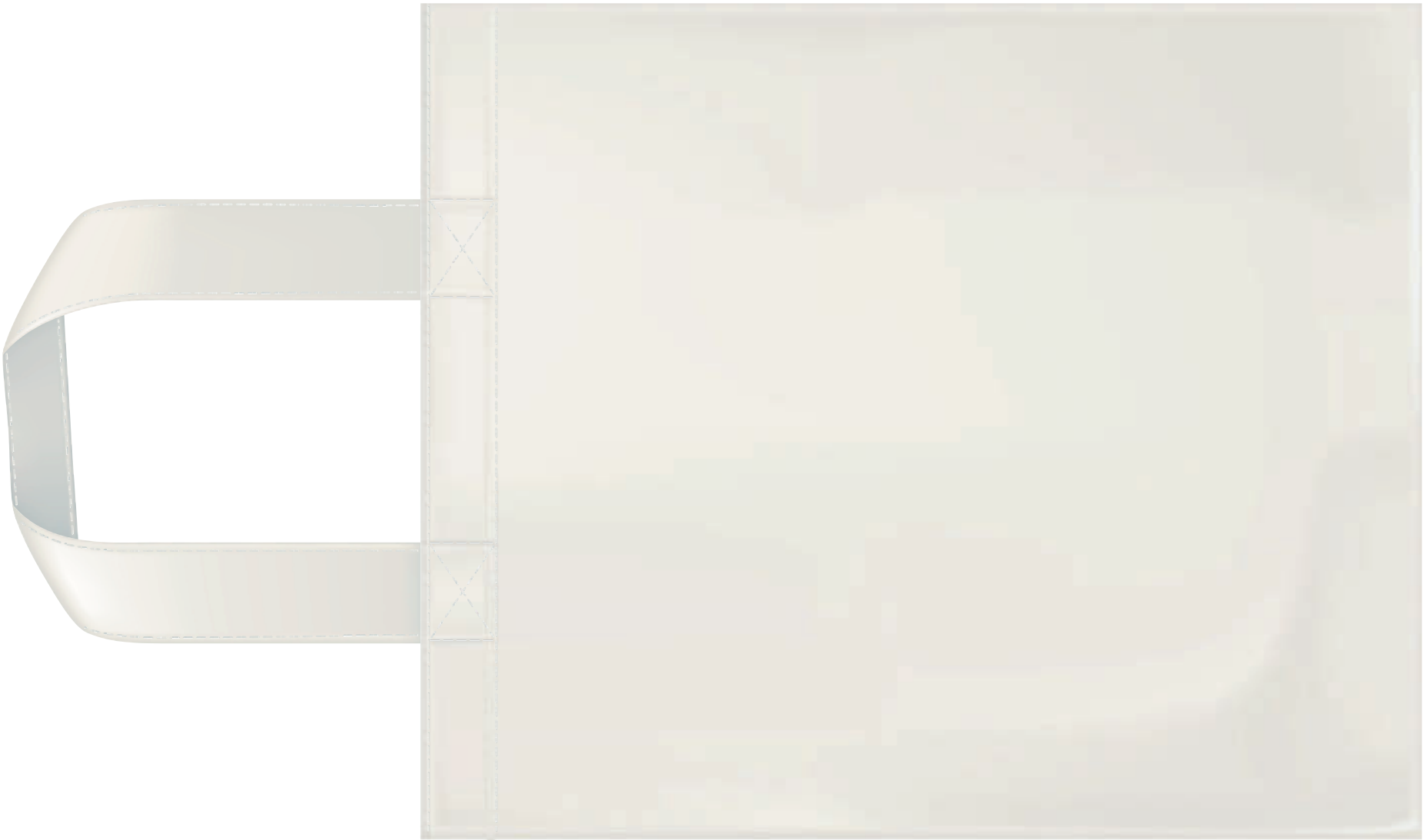






Eco Bag

In the bag, draw the products that you would buy in the store considering environmental protection.



Travel Footprint

OBJECTIVES:

- Recognize the impact of travel on climate change.
- The ability to inspire and motivate those around you through your example.

THINK & FEEL

(Evocation)

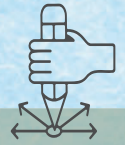
Appear in front of the students as a news reporter on television (you can prepare props and dress appropriately). Select five students to read **Breaking news** (in the Handouts). Discuss these questions: What is special about each piece of news? How does this relate to climate change? What interesting things have you learned? What surprised you?

KNOW & EXPLORE

(Awareness)

Talk to students about travel. Where do they like to go on vacation? Where were they the furthest? Which means of transport do they use most often? What is their dream destination? Does travelling have anything to do with climate change? Have them prepare the **TOP 10 travel destinations** worksheet. Discuss their findings and the impact of air travel on climate change.

Divide the students into three teams and give each a different text from the **Responsible Traveller** from the Handouts. It contains tips that you can use before your trip, during your trip or directly at your vacation location. The teams' task is to read individual texts for inspiration and supplement them with their own tips. They can mimic their suggestions while others guess what they are trying to show. In the end, create a joint poster of a responsible traveller.



ACT & CHANGE

(Reflection)

Give the students homework to make a presentation on “My Eco Travel Tips.” Their task is to choose three interesting places in Slovakia and present them in a presentation (name, location, availability, detailed information about the place, practical travel tips).

After listening to all the presentations, choose a location for a class trip. At the same time, each student can choose one trip they would like to go on with their parents during the school holidays. Write down the students' decisions and talk about the trips after the school holidays. For example, you can turn trip tips into a travel guide (in printed or electronic form) and distribute them at school.

Breaking News

The organizers of the ski races in Sölden (Austria) and Zermatt (Switzerland) clash with activists.

The International Ski Federation unexpectedly came under fire. The organizers of the two opening races in Sölden, Austria, and especially the one in November in Zermatt, Switzerland, were targeted by activists. According to the climate protection organization Protect Our Winters (POW), Swiss officials have dredged an area the size of five football fields from the protected Theodul Glacier. It was allegedly stolen to run the race. Together they call on FIS to behave responsibly:

"FIS, wake up! We call on the International Ski Federation to take the lead in this area and adapt the competition calendar to reduce the impact on travel and respect climate change. We want a planet worth living in."

Demänovská Ice Cave represents the northern part of the world-famous Demänovská Caves.

It is characterized by a permanent ice filling presence, bizarre and massive forms of underground spaces, rare cave fauna, as well as a rich history.

"Due to the previous weak winters, there was a massive loss of ice in the Demänovská Ice Cave. Over the last 10+ years, ice losses in summer have been far greater than ice gains in winter. Due to the effects of climate change, the cave has reached its lowest ice filling over the past 70 years. Currently, ice can only be found in the lowest part of the cave, but only on the floor. You will no longer see the ice drops and pillars in the cave. You can only admire them in older photos. We still hope that better times will come and that we won't be among the last to see ice in this cave."

Researchers found out that oceans are changing colour. They revealed the reason why this is likely happening

It's not only models that are predicting these changes will happen. We can now see it happening, and the ocean is changing, scientists say, warning people to take this seriously. You may not have noticed, but researchers have found in a new study that the oceans look different today than they did 20 years ago. Around 56% of the world's oceans have changed colour, with the blue waters becoming greener over time, according to a study published in the journal Nature. Tropical ocean water near the equator has been especially impacted. Scientists found that the change is likely driven by climate change. The ocean's colour is a result of whatever is in the upper layers of the water.

The Amazon is approaching a tipping point, risking a permanent transition from rainforest into savanna

If the Amazon exceeds the tipping point, the degradation of the forest to savanna will take 30 to 50 years and more than 250 billion tons of CO_2 will be released into the atmosphere, making it difficult to achieve the climate goals of the Paris Climate Agreement, according to a Brazilian scientist, Carlos Nobre.

Exceeding the tipping point and the gradual conversion of jungle into savannah would mean a significant loss of biodiversity. "This would increase the risk of epidemics and pandemics."

The Amazon rainforest binds around 123 gigatonnes of carbon in trees and soil. "It is in our interest to maintain this amount or, at best, increase it," explains scientist, Martin Lukáč. Otherwise, carbon from the forest will enter the atmosphere, causing the planet to warm more quickly. "Currently, possibly one billion tons of carbon are being removed from the Amazon rainforest every year."

Mud skiing

"It is assumed that ski resorts in Slovakia below 1,000 meters above sea level will not have sufficient conditions for their operations in 2030 to 2040," warns the Institute for Environmental Policy, explaining that even a high artificial snow-making intensity might not save the resort. According to him, average daily temperatures of no more than minus two degrees Celsius are considered suitable conditions for snow-making.

"We consider excellent conditions for skiing in Slovakia if the centre is open for at least 82 days per season, of which 35 days are necessary for the long-term operation of the centre," clarifies the Institute. It specifies that, according to the development scenarios for the 2030-2040 decade, there should be warmer winters and an unfavourable number of 26 ski resorts are likely to be below the number of 35 snow-making days.

At the same time, the 2050-2060 decade should bring a slight cooling and better conditions for four resorts. "In the coming decades, according to development scenarios, the average number of snow-making days will only decrease," adds the Institute. The worst situation is likely to occur towards the end of the century, in the 2090-2100. "There would only be two resorts with great conditions this decade," they say. According to them, the conditions in 19 centres would be good and the remaining 56 centres would be unsuitable.

Source: https://subscriber.politicopro.com/article/eenews/2023/11/06/ski-officials-clash-with-climate-activists-over-glacier-racing-00125422
Source: http://www.ssj.sk/sk/jaskyna/5-demanovska-ladova-jaskyna
Source: https://www.cbsnews.com/news/oceans-changing-color-climate-change/
Source: https://dennikn.sk/3680059/amazonia-sa-blizi-k-bodu-zlomu-hrozi-trvala-premena-dazdoveho-pralesa-na-savanu/

TOP 10 destinations

Read the selection of the TOP 10 destinations chosen by the travellers themselves and the followers of Tripadvisor. Calculate how much CO_2 you would produce (carbon footprint) if you flew on vacation to these countries: https://www.atmosfair.de/en/offset/flight/.

Destination	Emissions
1. Dubai	
2. Bali	
3. London	
4. Rome	
5. Paris	
6. Cancun	
7. Crete	
8. Marrakesh	
9. Dominican Republic	
10. Istanbul	

Write your own selection of **TOP 3 destinations** and recalculate CO_2 emissions.

Destination	Emissions
1.	
2.	
3.	

Responsible traveller

BEFORE THE TRIP

- Do your research – this is where you decide where to invest your money and what you ultimately support.
- Try homestays or camping – try new accommodation options such as small local guesthouses or even camping.
- Choose a property that promotes environmental responsibility – if you have any doubts about a hotel's sustainability initiatives, research its environmental certifications.
- Reduce the weight of your luggage – plan your wardrobe in advance and only take carry-on luggage instead of a large suitcase. The more weight planes and cars have to carry, the more fuel they use. This means more carbon is released into the atmosphere and warming occurs more quickly.
- Don't create unnecessary waste – it's important to think about how you can limit waste when packing – e.g. cutlery set and reusable cups, shopping bags, and quality bottles with water filters.

DURING THE TRIP

- Use public transport, bike or walk – limit taxis or rental cars if you can. Make more use of public transport, which allows you to cover longer distances.
- Travel by train – you can save up to 90% CO_2 emissions compared to air travel.
- Prefer electric cars or hybrid cars – if you are travelling by car on vacation, give preference to electric cars.
- Fly less – According to the International Air Transport Association, aviation is responsible for about 2% of global carbon emissions and is one of the fastest-growing polluters.
- Prefer a direct flight – if you must fly, choose the shortest and most direct flight to your destination. In aviation, up to 25% of emissions occur during takeoff and landing.

ON-SITE

- Minimize waste in hotels – many things in hotels are single-use. You can influence this waste with simple steps. Bring your own toiletries and don't use the hotel's small amenities. Hang towels so that they do not need to be changed every day.
- Save electricity – you can do it everywhere. Turn off the lights, air conditioning, television and other devices before leaving the room.
- Avoid animal attractions that advertise animal encounters as these may be unethical. It is better to choose an attraction that allows you to observe the animal in its natural environment from a safe and respectful distance.
- Snorkel and dive responsibly – coral reefs are threatened worldwide and are disappearing twice as fast as rainforests. Be careful not to touch or step on the corals as this could damage the already fragile ecosystem.
- Use sunscreens safe for coral reefs – as the usual ones contain zinc oxide or titanium dioxide, which are harmful to corals. One of the solutions is to use the so-called reef friendly products.
- Give priority to local dishes – your travel experience will be deepened and you will have the opportunity to get to know the country through its taste. At the same time, you support local restaurants, bakeries and thus the local economy. If you don't eat out, take advantage of farmers markets instead of shopping at big chain supermarkets. The farmers' food is grown locally, which also helps reduce the carbon footprint from transportation.
- Buy souvenirs from local craftsmen – support a local artist instead. In classic souvenir shops, there are often products that were made in another country and only imported by plane.

Source: www.idem.sk. Other interesting sources on responsible travel: https://twovelers.com/sk/zodpovedne-cestovanie/, https://www.uzivaj.si/ako-cestovat-zodpovedne/, https://krazom.sk/ekoturizmus/, https://blog.bagalio.sk/cestujte-zodpovedne-ako-setrit-prirodu-aj-na-cestach/

Climate Quiz

OBJECTIVES:

- Research and discuss the social and economic causes of climate change.
- Create your lifestyle with a low carbon footprint.

THINK & FEEL

(Evocation)

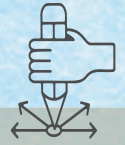
Ask the students how they like to spend their free time. Create and implement a simple survey. Write the main categories on the board (e.g. shopping, sports, playing PC games, social networks, surfing the Internet, reading books, drinking coffee with friends, travelling) and gradually assign the number of students to them. Everyone can choose three activities. Evaluate the survey and discuss whether leisure activities also have an influence on climate change and what connection they have to it.

KNOW & EXPLORE

(Awareness)

Consider setting up stations indoors or outdoors around the school on topics that connect fun, hobbies and different types of leisure activities to climate change. These stations can, for example, be aimed at: 1. Fast Fashion – a video about the fashion industry and its impact on the environment, climate and people; 2. Food systems – articles about palm oil or tomatoes from Almeria; 3. Electronics – a documentary about blood minerals or nomophobia, 4. Tourism – debate with a ranger from a nearby protected area; 5. Conspiracies – Search the Internet for false reports about climate change.

Divide the students into groups based on the number of stations and have them rotate through each one. Prepare a questionnaire for them with questions (or tasks) that they must answer at each station. You can find tips for interesting articles, documents and videos in the **Climate and Leisure** worksheet in the Handouts. After they have completed all the stations (or the next lesson), review what they have learned using the questionnaire.



ACT & CHANGE

(Reflection)

Encourage the students not to keep the information they have learned to themselves and not to remain silent. Choose an appropriate method to inform classmates and teachers. One of the currently very popular forms of entertainment is evening quizzes.

Divide the tasks of preparing such a quiz – organizing team, quiz leader, technician, promotion, question creation, prizes, etc. Focus the individual competition rounds (question categories) on topics related to leisure activities and climate change. Make sure to approach these not only from the perspective of the problem but also from the perspective of the solution (topics such as sustainable tourism, slow fashion, slow beauty, zero waste shopping, certified products and eco-labels, refurbished electronics, fair-trade flowers, fair-trade cell phone, books with environmental topics, Ecomaps and websites, ecological Internet search engine Ecosia, volunteer work and others). Use different types of questions to add variety to the quiz: picture, one-word questions, true or false, multiple choice, number guessing. Have fun together!

Climate and Leisure

Tips for interesting articles, documents and videos:

Fast vs. Slow fashion

https://stromzivota.sk/enviro-komunita/blog-enviro-komunity-stromu-zivota/moze-pomala-moda-zachranit-nasu-planetu
https://www.youtube.com/watch?v=0Fah6UyJMKg
https://www.greenmatch.co.uk/blog/2016/08/fast-fashion-the-second-largest-polluter-in-the-world

Foodstuff

https://slovakia.panda.org/?6946391/7-veci-ktore-treba-vediet-o-palmovom-oleji
https://domov.sme.sk/c/20448499/takto-vyzera-miesto-odkial-k-nam-prichadzaju-paradajky-bez-chuti.html

Electronics

https://www.youtube.com/watch?v=4sN2ZCz8Jwk
https://www.youtube.com/watch?v=X6OgBavJ3jY
https://www.youtube.com/watch?v=lU4vv7qCQvg
https://euractiv.sk/section/vonkajsie-vztahy/news/elektroodpad-ma-zostat-doma-a-nie-cestovat-do-afriky-018895/

Fair-trade Flowers

https://ciernalabut.dennikn.sk/2444/nepekne-tajomstva-kvetinovych-kytic/
https://www.france24.com/en/20190607-down-earth-pesticides-toxic-chemicals-slow-flowers-bouquets-agriculture-netherlands
https://www.facebook.com/brutnature/videos/how-growing-flowers-impact-the-environment/616227378810239/

Slow Beauty

https://www.naureus.sk/blog/detail/slow-beauty-pojem-ktory-rychlost-meni-za-zodpovednost
https://www.modrapupava.sk/blog/clanok/slow-beauty-uvedomela-a-precitena-starostlivost-o-krasu

Title:	Climatise Yourself – Methodological Guide for Schools Climate Change Living Lab
Editors:	RNDr. Bačkorová, PhD., Mgr. Veronika Páričková, Ing. Katarína Vajliková,
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Graphic design:	Stanislav Hupian, Miloslav Hlaváček
Proofreading:	Mgr. Alena Kostúriková
Published by:	Slovenská agentúra životného prostredia
Year of publication:	2024
ISBN:	978-80-8213-158-4

Project name:

Climate Change and Environmental Education Center (Living Lab) in Dropie

The project benefits from Iceland, Liechtenstein and Norway through the EEA Granst and Norway Grants.
It is co-financed from the State Budget of the Slovak Republic.
www.eeagrants.sk

ISBN 978-80-8213-158-4

Project partners:

TRONDHEIM MUNICIPALITY

Bjerknes Centre for Climate Research
BCDC Bjerknes Climate Data Centre

SLOVENSKÁ AGENTÚRA ŽIVOTNÉHO PROSTREDIA
SLOVAK ENVIRONMENT AGENCY

LIVING LAB DROPIE