Green Planet

TEACHER'S HANDBOOK

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ANNEXES 166

Dear teacher,

The aim of this subject is to raise awareness that the global and local problems of sustainable development are interlinked with the everyday activities of individuals and communities. The goal is to enable students to make decisions in their everyday lives and in their future careers, positions, social and family roles with a sense of responsibility for the future, and using a systems approach.

The teaching material is mainly communicated through experiential learning and analysis, reflection, argumentation, discussion, collaboration, joint planning and creation. It is important that learning be experiential and motivating for students, so that they awaken or maintain their curiosity and interest in finding the root causes of problems, and in looking at how their own behaviour can contribute to solving them; also, that they be willing to make the necessary changes. To this end, we recommend informing and involving parents in the various programmes to support their child's plans.

Sustainable development is not a single discipline, but a complex and multifaceted environmental, social and economic system in which humanity, societies and communities seek a way out of the identified threats and crises. It follows that teachers and students learn together in this process, analyse problems together, share experiences, and jointly seek solutions. It can often be worthwhile for colleagues teaching different subjects to work together to achieve the goals.

The teaching material is broken down into topics according to typical situations in the students' lives. The topics themselves are summarised into issues of a fictional magazine. Depending on the teacher's specialist areas as well as the attitude and outlook of the class, a selection of articles from each issue can be used to define the year's topics in line with the development goals set out in the framework curriculum. Just like a good magazine, we hope that everyone will find the articles that best suit their own interests and style, and will be encouraged to read more.

It is recommended to use the teaching material building on the pupils' prior experience and everyday knowledge, as well as on the related subject content. Forty-five minutes are often not enough to explore a topic in detail and to carry out some of the exercises presented in the handbook, so it may be effective to approach the subject in a block-teaching format, with two lessons every two weeks for example, where this is feasible. A learning project spanning several weeks can provide useful experiences in real life as well.

Sustainability education could be a good example for use of the flipped classroom teaching method. If the students are happy to do research at home and carry out projects, each lesson can be used to synthesise, understand and interpret for real life the articles, information and projects previously studied. They can also learn from each other and solve problems together.

Assessment is a key element of learning and teaching. It is important that this assessment is also supportive, encouraging and motivating for students to take future action. You should assess, reward and encourage attention, effort and creativity rather than mechanically grading the traditional tests and papers, and especially their content. There should also be room for

self-evaluation and feedback on each other's work. Inform the students, parents and colleagues about the evaluation criteria.
After reading the framework curriculum and the textbook, we recommend that you think about what you can effectively incorporate into your everyday teaching practice. From each chapter, select the articles that are likely to engage your students, and design a detailed plan of where you want to take them, through which experiences.
The textbook, workbook and this teacher's handbook are designed to provide help in this exciting and challenging shared work.

Let's green the planet together!

Katalin Czippán
professional supervisor

Recommendations for teachers who also teach pupils with special educational needs in mainstream education

Sustainability education must reach and address all groups – this is the only way that the mission of the subject will be achieved and fulfilled. This is why we consider the development and mainstream education of pupils with special educational needs (SEN) important.

Teachers may not meet all students with special educational needs during their studies at secondary school. However, *Annex 1* of the handbook provides a summary of the main types and characteristics of special educational needs, as well as good advice and methodological alternatives for the mainstream education of pupils with special educational needs.

The target group of the recommendations is pupils with special educational needs and the following diagnoses:

- locomotory disabilities,
- sensory disorders (visual, auditory),
- speech impairments,
- autism spectrum disorder, and
- other psychological development disorders.

General recommendations for the mainstream education of pupils are given in *Annex 1*, with additional useful information on each topic and subject area in the form of *SEN recommendations* in each issue.

Andrea Jenei
special education teacher

SUSTAINABLE DEVELOPMENT

What is that?

A guide to working with the Sustainable Development magazine

Purpose of this issue	Objectives of the framework curriculum: - Familiarise pupils with approaches and knowledge related to sustainable development; - (Develop or) shape future-oriented thinking; - Recognise our responsibility to future generations.
Time frame	2 lessons
Links within the textbook and between subjects	This chapter lays the groundwork for all the other chapters. Throughout the teaching material, the concept of sustainability is not approached in a fragmented manner – separately for the environment, economy and social justice – but in a complex way, connecting the subjects.
Focus on skills development	The students: - by analysing a concrete problem, recognise the interdependent relationships between the natural and built environment, the functioning of the individual and the socio-economic space around them; - analyse, comment on and take decisions that promote sustainability based on given criteria; - are capable of systems thinking.

I. Methodological recommendations for working with the topic

In this issue, as in the whole textbook, the focus is on the concepts of self-reflection, planning and ability to act, as well as on recognising systemic interconnections, as these support a paradigm shift and proactive action in the interests of sustainability.
It is important to stress that you do not need to go through the entire textbook or workbook. The aim is to provide a basis for the topic according to the composition, prior knowledge and interests of the class/group, and the prior knowledge of the teacher.

a) Practical, empirical approach

Play is also one of the best ways to identify sustainable and unsustainable processes and their causes. In this way, supported by feelings the students are able to recognise how we get caught up in certain processes in our lives, how they can recognise these patterns of behaviour, and how they can change them.
To this end, it is useful to start the lesson with the fishing game (Fishbank) because playing and discussing it provides many opportunities for conversations related to any of the developmental objectives listed above, according to the teacher's interests and level of preparation. If there is time, you can continue with the article on the tragedy of the commons *[A tip on how (not) to ruin ourselves]* and draw parallels between the game and the description. The students can look for commons in life, or after reading the introduction they can collect examples as homework: e.g. how many shops and malls can a municipality and its surroundings support; how many people use a drinking water supply and how; how they plan how much of the local government budget is needed and what it is made up of; a park or a nature reserve as a common: how many people use them and how; whether the different uses can coexist.

b) For theoretically minded teachers/classes

You could start with a talk based on the introduction of the textbook (problems, the need to find solutions, definition of sustainable development, sustainable development goals (SDGs)), and then play the game "*In the web of the SDGs*" to explore the systematic links between the SDGs. Here too, it is important to use examples from everyday life to demonstrate the importance of sustainability.

II. Suggested literature and resources for teacher preparation and working with material

For ideas ***see the UNESCO publication "Education for Sustainable Development Goals – Learning Objectives" published in Hungarian by the Educational Authority. (***https://ofi.oh.gov.hu/kiadvany/unesco-fenntarthato-fejlodesi-celok-oktatasa-tanulasi-celok***; downloaded on 1 February 2021).***

If you want to develop your sustainability education skills and measure where you are in this regard, we recommend you visit the Hungarian website for RSP competencies. (https://www.kuttanar.hu/altalanos/rounder-sense-purpose/az-rsp-kompetencia-keretrendszer***; downloaded on 1 February 2021).***

Recommended for games, exercises Sweeney, L. B. – Meadows, D. (2015). *Rendszergondolkodás játékosan* [Systems thinking through play]. SoL Institute, Budapest.

The following publications on sustainable development and unsustainable processes can help you to prepare in advance and understand the context of the problems:

Czippán K. szerk. (2015) *Fenntartható fejlődés. Az erőforrások tudatos használata. tankönyv köztisztviselők számára [Conscious use of resources. Textbook for Civil Servants].* Nemzeti Közszolgálati Egyetem. Budapest (http://m.ludita.uni-nke.hu/repozitorium/handle/11410/10087***; downloaded on 1 February 2021)***

Hetesi Zs.—***Kiss T. (2018) Ember és természet. Kiút a zsákutcából.*** *[Humans and nature. A way out of the deadlock]* Nemzeti Közszolgálati Egyetem. Budapest (https://vtk.uni-nke.hu/document/vtk-uni-nke-hu/Ember%20%C3%A9s%20term%C3%A9szet%20-%20Ki%C3%BAt%20a%20zs%C3%A1kutc%C3%A1b%C3%B3l.pdf; ***downloaded on 1 February 2021)***

Zlinszky J. –Balogh D. ed. (2016) *Világunk átalakítása. A fenntartható fejlődés 2030-ig megvalósítandó programja* [Transforming our world: sustainable development agenda to be implemented by 2030]. Pázmány Péter Catholic University, Faculty of Law and Political Sciences, Budapest (https://jak.ppke.hu/uploads/collection/546/file/Vilagunk_atalakitasa.pdf ***downloaded on 1 February 2021)***

Bartus ***Gábor szerk. (2013) Nemzeti Fenntartható Fejlődési Keretstratégia. NFFT. Budapest (***https://www.nfft.hu/documents/1238941/4101589/Nemzeti+Fenntarthat%C3%B3+Fejl%C5%91d%C3%A9si+Keretstrat%C3%A9gia.pdf/4ee5e5a1-4bbc-4433-8245-dd2f52a4e667?t=1580132846319***; downloaded on 1 February 2021)***

The Living Planet Report has been published every two years by the World Wide Fund for Nature (WWF) (https://wwf.hu/letoltes/elo-bolygo-jelentes/***; downloaded on 1 February 2021) The 2016 report gives a clear picture of the ecosystem services and threats, as well as the ways to address them. The 2018 report provides a visual representation of the SDGs in relation to nature (biosphere), society and the economy. The 2020 report also includes an easy-to-understand youth version. You can download very illustrative infographics and posters from the website too. (***https://wwf.hu/letoltes/infografikak/***; downloaded on 1 February 2021)***

There are three classic definitions of sustainable development:

1.) "Sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs." *(UN Report on Our Common Future, 1987)*
2.) "Sustainable development is about achieving continued social well-being without growing beyond our ecological carrying capacity. When something grows it gets bigger. When something develops, it gets better. To grow means to increase naturally in size by the addition of material. To develop means to expand or realise the potentialities of; to bring gradually to a fuller, greater or better state." (*Hermann E. Daly—Sustainable Growth: An Impossibility Theorem. 1990)*
3.) "Sustainable development is the system of social and economic conditions and activities, which preserves the natural values for the present and future generations, uses the natural resources economically and expediently, and ensures the improvement of the quality of life and the preservation of diversity in the long run from the aspect of ecology." *(Act LIII of 1995 on the General Rules of Environmental Protection)*

III. RECOMMENDATIONS FOR LESSON PLANS

1-2 lessons

Topic of the lesson: Sustainable development, systems thinking

Time required: 2 lessons

Pedagogical objective:
- Introduction to the concept of sustainable development,
- identifying some of the sustainable and unsustainable choices that threaten common resources;
- laying the foundations for systems thinking;
- raising motivation, tuning into the subject.

For a more practical approach				
Time	**Block name, short description**	**Purpose of block, tasks to be completed**	**Working style, methods**	**Tools needed, preliminary preparation**
"A" version, lesson 1				
30 minutes	Fishing game	Play the fishing game, with instructions.	small groups	See game description. It should be decided beforehand whether the teacher will choose version "A" or "B".
15 minutes	Reflection, outlook	Evaluate the task as described in the game. If there is time, you can also discuss in class or give them homework to think about the similarities between the textbook article *How (not) to ruin ourselves?* and the fishing game; or whether they see a connection with the article *Giant fleas and giant ant terminators*? Teachers can choose between version "A" or "B" depending on the lessons that can learned and the novelty and interesting nature of the different articles.	frontal, discussion	-
SEN recommendations When creating a group for the fishing game, it is advisable to form mixed groups, with pupils with special educational needs in different groups so the others can support them. A student with a learning disability should not be given the role of game master. For pupils with behavioural problems and autism spectrum disorder, it is important to discuss before the game – and if necessary write down – the rules of conduct and behaviour expected during the game. Give dyslexic pupils more time to understand the game, if necessary, giving them and pupils with autism spectrum disorder a brief outline of the game, without, of course, revealing the purpose of the game.				
Version "A", lesson 2				

5 minutes	Arrival – recall the previous lesson.	If you can't keep the lessons in blocks, briefly recall that the fishing game was played in the previous lesson: - Who remembers what, and what got their attention? - What is important for you that they remember?	frontal, conversation	-
15 minutes	Different areas of sustainable development – student presentations.	In small groups: who has worked on what: article – what was the lesson learned, what was new, interesting (1, max. 2 minutes).	small group (creative) presentations	Probably a projector, laptop/PC and speakers based on preliminary information from students.
20 minutes	Understanding the essence of the SDGs, exploring the links.	Play the game "In the web of the SDGs", then note down the links that interest them in the workbook.	frontal, game	Balls of wool, printed version of the goals' logos – as described.
5 minutes	Reflection	What was interesting in the exercise, presentation, possible further reading, homework.	frontal, conversation	-
SEN recommendations There should be opportunities for work in pairs or groups when going through the articles. The voluntary nature of verbal expression can be an important aspect of the presentation. For students with certain speech impairments, hearing impairments or speech disorders due to reduced mobility, more time should be provided for the presentation. A good option is to record the presentation and the accompanying oral demonstration in advance, or create a subtitle for the presentation. When carrying out the *In the web of the SDGs* exercise, be aware of the disabilities of learners with reduced mobility; organise the conditions so that they can also participate in the game.				

For more theoretically minded classes				
Time	**Block name, short description**	**Purpose of block, tasks to be completed**	**Working style, methods**	**Tools needed, preliminary preparation**
Version "B", lesson 1				
15-30 minutes (depending on class size and activity)	Engaging the students	Conversation: - Who has heard of sustainable development? - What comes to mind about this concept? Everyone should write down on a piece of paper, legibly, one concept or expression that comes to mind. Collect them by everyone saying one first, which are then stuck on the big sheet. Immediately after the first one, you can ask who else said something similar – then bring it out and stick it on or next to it. If a concept is mentioned that is related to one of the ones already stuck there, place it close by. If it is not clear what the	individual, then frontal, joint groups	Sticky notes (Post-its), thick felt-tip pens, wrapping paper or another surface to stick the notes on.

For more theoretically minded classes				
Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		student means, ask them to explain again. Accept negative notes with encouragement, thank them for their honesty, and note that you are curious to see if the student's opinion changes by the end of the school year. It is very good to have different opinions because it allows you to start healthy debates; moreover, diversity is the spice of life and makes you strong. At the end, look at the whole picture, and ask them to try to group the concepts. All groupings can be good, there is no one right solution. There can be problem-, solution- or question-type notes; yet they can be grouped by living space, natural, social or economic elements for example, but it is important to have a clear grouping criterion. Take a photo of the picture and, if possible, leave the groups of concepts on the wall; you can even return to them at the end of each lesson: e.g. what you have learned more about, what you would add based on the new knowledge, etc.		
10-15 minutes	Laying the foundations	A talk on why it is necessary to address this issue. You can even start with a film clip.	frontal, presentation	Projector, speakers, film.
10 minutes	Reflection	Who has worked or would like to work on a similar topic – either as a project or to explore a topic. Task preparation: forming small groups when planning group projects or assignments.	frontal discussion	-
5-10 minutes	Assignments	a) Who should read what from the first chapter for the next lesson, and work creatively on it for presentation to the others (in a motivating, easy to demonstrate way, max 2-3 minutes). b) The student should imagine that they are an expert dealing with a local government issue, and think about what they can do to promote sustainability. Choose from the following areas: - urban development, - town planning,	frontal	-

<table>
<tr><th colspan="5">For more theoretically minded classes</th></tr>
<tr><th>Time</th><th>Block name, short description</th><th>Purpose of block, tasks to be completed</th><th>Working style, methods</th><th>Tools needed, preliminary preparation</th></tr>
<tr><td></td><td></td><td>- protecting the built and natural environment,
- housing management,
- water management and drainage,
- sewerage,
- maintaining roads and public spaces,
- local public transport,
- ensuring public and municipal cleanliness,
- contributing to local energy supply, employment solutions,
- providing community space,
- support for cultural, scientific, artistic and sporting activities,
- ensuring the rights of national and ethnic minorities,
- promoting community conditions for a healthy lifestyle.</td><td></td><td></td></tr>
<tr><td colspan="5">If there is a possibility, a project could be set up where:
- local councillors work alongside a “shadow student” who is involved in local issues. The students suggest sustainable solutions, which are discussed at school, at a local council meeting, or
- the students hold a meeting themselves to which they invite experts from the local government. The students present their suggestions, which they have throughout the year, and the local government gives feedback on these suggestions.
In both cases, thorough preparation is important. The teacher should contact the relevant experts in the local government, and explain the pupils' tasks to them. Prepare the pupils for the official visit. If a board meeting is chosen, discuss the roles, and clarify who will do what.</td></tr>
<tr><td colspan="5">SEN recommendations
Check the spelling of the concepts written on the small notes by students with dyslexia, dysgraphia, hearing impairments or spelling difficulties, so that it is not an embarrassment later when everyone sees the papers. When showing a lecture/film, make sure that hearing-impaired students can hear it well, and if possible, use subtitles. Prepare visually impaired students for what the film will be about, if possible by giving them an audio file beforehand so that they can get involved in the topic. For pupils with behavioural problems and autism spectrum disorder, it is important to discuss before the game – and if necessary write down – the rules of conduct and behaviour expected during the game. Each pupil with special educational needs can choose an appropriate activity for their special educational needs when assigning tasks for the next lesson.</td></tr>
<tr><td colspan="5">Version “B”, lesson 2</td></tr>
<tr><td>5 minutes</td><td>Looking back</td><td>If you can’t keep the lessons in blocks, briefly recall:
- Who remembers what, and what got their attention?
- What is important for us?</td><td>frontal discussion</td><td>-</td></tr>
<tr><td>20-35 minutes</td><td>Description of tasks</td><td>Presentation of the tasks assigned in the previous lesson – depending on the number of small groups and the timing of the presentations – reflection individually or together: what was new, interesting, instructive, why?</td><td>small-group presentation</td><td>Projector, computer, speakers, depending on the groups.</td></tr>
</table>

For more theoretically minded classes				
Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		If they are working on the local government topic, they can note down the tasks in the workbook.		
35-45	Taking notes	If there is still time, play the "In the web of the SDGs" game then note down the links that interest them in the workbook (the time can be shortened if the goals are discussed beforehand).	frontal, game	Ball of yarn, printed goals and icons.
SEN recommendations In the case of students with learning or attention difficulties, or some types of speech and hearing impairments, it is best to provide a printed or digital glossary where later they can look up the meanings of the terms. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms. When presenting group exercises, try to ensure that all students have the opportunity to talk about the topic. Take care to create an atmosphere of trust for speaking up. Avoid, and help pupils avoid, grading, as this can encourage them, including those with special educational needs, to express themselves and form opinions when learning the subject. When also teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it might be necessary to define and refresh the rules of group work and the spider web exercise (finding connections, depicting with yarn) to avoid conflicts.				

IV. Recommendations and suggestions for the exercises in the textbook and workbook

a) Fishing game (fishbank)

Topic, subject	Sustainable and unsustainable
Position of exercise in teaching process	Introduction to concept of sustainable development
Time required for exercise (minutes, hours, days)	35-50 minutes, depending on the solution chosen, the level of practice, the level of preparation and the depth of the discussion.
Prior knowledge and definitions needed for the exercise	No prior knowledge is required.
Aim of the exercise	The aim is for the students to understand: - public goods management issues, - consequences of responsible use and public use of common resources, - the sustainability aspects of cooperation and competition.
Competences that the exercise develops	Strategic competence Cooperation Critical thinking Systems thinking
Tools needed for the exercise	When planning the game, decide whether "A" the pupils work independently in groups of 4 with teacher guidance; "B" the whole class plays together (2 or 4 groups) and the teacher is the game leader, possibly asking for 1-2 helpers (the advantage here is that the teacher can see the whole game, it is easier to follow the rules, more aspects can be discussed and the whole class needs to cooperate; the disadvantage is that the fishing families may be too big). For "A": print and cut out the task description in the appropriate number: - Prepare 120 imitation fish for each small group: small pebbles, dry pasta, beans (or any other suitable, easy to handle items that are not too big and are non-polluting) in the same number of boxes or bags as the number of small groups. - 1 sheet of paper on each table on which they can draw a pond, or a string to surround the pond. - 1 cloth to cover the fish. For "B": 1 set of imitation fish is needed. On the central table, equidistant from each group, prepare the pond, and put 20 fish in it, then cover it up when the game starts. In both cases, write up the rules of the game (see below).
Internet resources that students can use (for classroom and homework)	-

Recommended resources for teacher preparation	Sweeney, L. B. – Meadows, D. (2015). *Rendszergondolkodás játékosan* [Systems thinking through play]. (http://ujkor.hu/content/tarsadalomismeret-tortenelemoran-kozlegelok-tragediaja***; downloaded on 1 February 2021)***

INSTRUCTIONS FOR THE EXERCISE

FORMING GROUPS

"A": Divide the children into groups of 4. Choose or designate a game master in each group (someone who is good at division, and thus able to multiply the fish). In this case, pupils play the game independently.

"B": Form 3 or 4 groups, preferably of the same size, relatively far apart. If you can't divide the students evenly, ask some of them to observe or help.

MAIN STEPS TO SOLVE THE TASK

Tell the students that they are from a fishing village. They depend on fishing for their livelihoods. (In case "A", each group is one village, in case "B", the whole class is one village, and the students in each group form a family.)

The small pebbles, dry pasta, beans (or any other suitable, easy to handle items that are not too big and are non-polluting) represent the fish in the pond next to the fishing village.

Write on a whiteboard or projector, and make sure that players can always see the general rules:

- the maximum holding capacity of a pond is 20 fish;
- one fisherman/family can catch 1, 2 or 3 fish per round;
- 3 or 4 families make their living from the pond (depending on how the groups are formed);
- the aim is to catch the most fish by the end of the 10th round.

"A": Each village (group) should form a larger pond on their table. Name it. Place 20 fish in each pond, and cover with a cloth/paper sheet. Give the game masters (per table) the task description and the young fish.

"B": Every fishing family should fold a paper boat, and give it a name. Let the game begin! Which village will be the most successful by the end of the 10th round?

Game description

Case "A": The game masters receive the description. If possible, call them aside, or go over the task with them during the break before class. Accordingly, once the rules are known, the game is played in groups. Tell the students to call the teacher over if there are any questions in a group, but not to discuss things out loud, because different groups may follow different strategies, and everyone should be allowed to develop their ideas in their own way.

Case "B": In this case, ask fishing boats to go to the lake every "year", and mark on a slip of paper how many fish they want to catch that year. The teacher puts it in their boat, preferably out of sight of the others, and sends it back. The teacher notes down how many fish each group caught in each year (in the table at the end of the description). At the end of each round, the fish stock is increased by a quarter of the fish remaining (rounded up from 0.5).

First, the teacher should keep all the data secret. The rate and amount of reproduction, too, but if someone asks, tell them. If someone asks it quietly for his or her group, give this information only to that group. If they want to talk, they can ask. If they want to know, they can ask how many fish there are in the pond. In this case, show it to them (but only if they ask a definite question).

Conclusion

Case "A": Write on the board how many fish the groups caught individually and collectively during the 10 rounds.
Case "B": Write on the board how many fish each group caught in total.

Discussion

Start the discussion by saying there were no more mandatory rules, just the ones on the board. Did they assume there were more than that?
Other aspects:

- We designed the circumstances as if it were a competition, and the information was secret, but if someone (had) asked for it, they could have (got) it. Yet our assumptions are strong, and we often deliberate on the information we receive.
- Some groups will run out of fish before the 10th round (around the 6-7th round); that's OK, just talk quietly about what happened, and add up the total catch.
- Some groups instinctively seek a balance: there will still be fish in their pond at the end of the 10th round.
- Some groups foresee the consequences of greed, but follow the objective: they plan the rounds so that they can get to the tenth, and then catch all the fish.
- Since it is not forbidden (see the game master's task description below) for players to talk to each other, some groups may start cooperating in time (i.e. essentially catching fish in public).
- How did they understand the situation: should they catch as much fish as possible individually, or together? Did they compete? Was it kept secret how much was caught by whom? Did they talk to each other? What makes a pond sustainable in the long term? It is good if the students can explore these tactics and strategies themselves during the game.
- After the 10th round, each group should report its results: the total number of fish caught and the number still in the pond, or the number of rounds after which the fish stock ran out.
- Which team was the most successful?
- What would you do differently if you were playing again? Could a rule be agreed on how much can be fished in a day? What is the maximum number of fish that can be caught without compromising regeneration? What similarities did they discover between the game and real life? Does the game remind you of any of your own experiences?

Description for the game master

You are the fish keeper.
Rules and framework on the board:

- the maximum holding capacity of a pond is 20 fish;
- one fisherman/family can catch 1, 2 or 3 fish per round;
- 3 or 4 families make their living from the pond (depending on how the groups are formed);
- the aim is to catch the most fish by the end of the 10th round.

At the beginning, there are 20 fish in the pond, never more. Cover it when starting the game. Ask each fisherman to tell only you how many fish they want in a "year" (round), and preferably give it to them without the others seeing it. Keep their fish hidden from others.

Note down for yourself how many fish were requested in each round by each group, and how many in total. Reproduce by a quarter of the remaining fish, but the total number should never exceed 20.
Make it as if everything were confidential, and fishermen don't talk to each other, as they do in real life. But if they ask you how the number of fish is increasing, or how many fish are in the pond, you can tell them. But only if every fisherman wants to know it. They can discuss it if they realise it is important. If the fish run out, distribute them in the last round according to the order in which they asked, for as long as you can, then indicate that you have no more. You can note the data in the table below. Make sure it is confidential at first, and only show it if everyone agrees.

Round number	Number of fish at start of round	Fisher-man 1	Fisher-man 2	Fisher-man 3	Total fish	Remain-ing	Reproduc-tion (25%, or $^1/_4$)

b) In the web of the Sustainable Development Goals

Topic, subject	Learning and interpreting the Sustainable Development Goals
Position of exercise in teaching process	The exercise can be used for engaging the students, discussing the content of the topic and summarising.
Time required for exercise (minutes, hours, days)	Min. 20-25 minutes
Prior knowledge and definitions needed for the exercise	Sustainable Development Goals (SDGs) – can also be discussed at the start of the game
Aim of the exercise	The aim is to familiarise students with the principles of future sustainable development and the opportunities for international cooperation in this field.
Competences that the exercise develops	Systems thinking Critical thinking Strategic competence
Tools needed for the exercise	Sustainable Development Goals printed out for everyone, and 1 copy of their icons. 1 ball of string or yarn.
Internet resources that students can use (for classroom and homework)	https://unicef.hu/igy-segitunk/hireink/globalis-celok-gyereknek
Recommended resources for teacher preparation	Sweeney, L. B. – Meadows, D. (2015). *Rendszergondolkodás játékosan* [Systems thinking through play]. SoL Institute, Budapest. Zlinszky, J. – Balogh, D. ed. (2016) *Világunk átalakítása: a fenntartható fejlődés 2030-ig megvalósítandó programja.* [Transforming our world: sustainable development agenda to be implemented by 2030]. (https://jak.ppke.hu/uploads/collection/545/file/Vilagunk_atalakitasa.pdf; downloaded on 1 February 2021)

INSTRUCTIONS FOR THE EXERCISE

Depending on the size of the class, 1 student or 2 together should choose a goal each. (1-2 helpers, observers may be left without an icon, or if one of the icons cannot be understood, it may be omitted.)
The "owners" of the goals should form a circle, and each person or each pair takes the picture of their goal or places it at their feet. They don't have to line up next to each other in order. Give the end of the string to one pupil/pair, and ask them to find a connection with another goal. This student should keep the end of the string and pass the ball while explaining the connection with the other goal. The pupil/pair addressed should grab and hold the string, and pass on the ball. (It would be nice to involve everyone, and if the ball got to everyone at least once.)

Discussion, reflection

Let's look at the web:

- If you lift one of them, what happens?
- If you move the other one down, what do you notice?
- What happens if we let go completely?
- What does this mean for real life?

Ask the students how they felt during the exercise, or if they remember any special moments from the game?

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Methods	Tools	Notes
10 minutes	Read the SDGs (select one goal per individual/pair).	Knowledge processing	Goals printed per person/pair.	Can be assigned in advance, so less time is spent in class
10 minutes	Thinking through the links between the goals, illustrating with string.	Game	String, ball of string printed goals	
5 minutes	Reflection	Discussion	-	

SUSTAINABLE DEVELOPMENT GOALS

1. End poverty in all its forms everywhere.
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
3. Ensure healthy lives and promote well-being for all at all ages.
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Achieve gender equality and empower all women and girls.
6. Ensure availability and sustainable management of water and sanitation for all.
7. Ensure access to affordable, reliable, sustainable and modern energy for all.
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.

9. Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
10. Reduce inequality within and among countries.
11. Make cities and human settlements inclusive, safe, resilient and sustainable.
12. Ensure sustainable consumption and production patterns.
13. Take urgent action to combat climate change and its impacts*
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
17. Strengthen the means of implementation and revitalise the Global Partnership for Sustainable Development.

NATURALLY IS BEST!

Conscious nature conservation

A guide to working with the Naturally is best! magazine

Purpose of this issue	Objectives of the framework curriculum: - Developing an environmentally aware attitude and a responsible lifestyle for nature. - Learning about environmental ethics. - Promoting a commitment to maintaining biodiversity as a key element for the survival of humanity. - Learning about ways to preserve local values through eco-tourism. - Recognising the negative environmental impacts of tourism and how to address them.
Time frame	5 lessons
Links within the textbook and between subjects	This topic forges close links with the chapters on *Your interest, your life* and *Building a vision*. Connections with other subjects in grades 9-10: a) Biology - Understanding the material and energy flows of biocenoses.

	- Understanding the concept of abiotic environmental factors and linking them to physiological and ecological tolerance. - Analysis of the carrying capacity of the environment. - Assessing the biological importance of habitat and protected species conservation, reviewing opportunities for individual and social action to support this, and collecting successful examples. - Identifying the effects of human activities on living systems based on data, and exploring potential consequences. - Highlighting the legislation on environmental protection and nature conservation as well as the importance of international conventions with examples. - Learning about, and where possible supporting, the activities of civil initiatives and organisations related to ecological sustainability. b) Geography - Developing systems thinking, individual and collective responsibility, environmentally aware and green attitudes as well as responsible decision-making through knowledge of the global and local causes, consequences, mitigation and adaptation strategies of climate change. - Earth's water resources, main types of surface and groundwater and their characteristics. - Understanding the various natural and socio-economic processes that lead to global problems, and which are simultaneously present on our planet. Identifying their interrelationships, possible ways to mitigate them and their difficulties.
Focus on skills development	The students: - argue for the importance of protecting nature and enhancing biodiversity; - can illustrate the links between their lifestyle and the use of natural resources; - identify some of the ecosystem services in an area as well as the links and contradictions between the use of these services; - plan and organise a biodiversity project with their classmates (e.g. tree planting, school gardening, building a bee hotel) and an ecotourism tour, excursion or project where they live or in the school's municipality (or participate in such); - can use internet and mobile applications to learn about nature.

I. Methodological recommendations for working with the topic

The warning signs of the last decades have made us realise that natural resources are finite, and we need to take special care to protect them. Many studies have been published on the drastic loss of natural habitats, with humans taking more and more land from wild plants and animals. In this issue, we describe the services provided by each ecosystem, how to recognise them, and what can be done to restore and protect the natural state of a given area.

The main focus of this issue is a field activity that allows students to learn about the eternal laws of nature through their own experiences, to identify human interventions that damage nature, and to find ways to restore the biocenosis of an area. However, one of the biggest problems of our time is that natural habitats are also damaged by climate change, which is caused indirectly by us humans too. Yet the depletion of these natural habitats causes an ecological imbalance, which poses a threat to humans as well.

In this chapter, we describe the Carpathian Basin's rich natural heritage: we have valuable forests, grasslands and wetlands, home to many rare and vulnerable species of plant and animal. We present the nature conservation laws that have been created to protect the vegetation cover of an area by the power of law, and to provide a peaceful habitat for the animals there. We will also present a number of possibilities that students can explore in order to contribute to nature conservation as ordinary people.

The field activities in each lesson are suitable for developing a research approach as well as for collecting, evaluating and analysing data. To increase efficiency, it is recommended that the field exercises are completed in 2-hour blocks in an afternoon session, or even on theme days.

We recommend primarily adopting practical and experiential methods of teaching – focusing on games and projects in each lesson.

II. Suggested literature and resources for teacher preparation and working with material

Father of the Gaia hypothesis (https://ng.24.hu/fold/2019/07/26/100-eve-szuletett-a-gaia-elmelet-atyja/; ***downloaded on 1 February 2021)***

To make infographics, we recommend the article "How to make an infographic?" (https://www.hogyankell.hu/Infografik%C3%A1t_k%C3%A9sz%C3%ADteni; ***downloaded on 1 February 2021)***

For poster design, we recommend the article "Shocking posters of social issues" (http://ecolounge.hu/art/tarsadalmi-ugyek-sokkolo-plakatjai; ***downloaded on 1 February 2021)***

For fieldwork, we recommend the following websites:

Freshwater invertebrates – definitions for the identification of animals (field identification sheet: https://bisel.hu/UserFiles/hatarozolap.pdf; colour identification sheet: https://bisel.hu/UserFiles/File/szineshatarozo.pdf; ***downloaded on 1 February 2021)***

Biró, M. - Molnár, Zs. (2011). *Milyen természetes a környezetünk? Terepi Adatlap a MÉTA Természetesség-mérőjéhez* [How natural is our environment? Field Data Sheet for the MÉTA Naturalness Measurement]. Hungarian Society for Environmental Education, Budapest (https://www.okologia.mta.hu/node/2732; ***downloaded on 1 February 2021)***

For nature conservation information, we recommend the following page: http://www.termeszetvedelem.hu/ (***downloaded on 1 February 2021)***

For nature conservation activities and ideas, we recommend the following pages:

Making a bee hotel (https://www.mme.hu/darazsgarazs_keszites; ***downloaded on 1 February 2021)***

Birdhouses and nesting boxes (https://www.mme.hu/oduk_es_koltoladak; ***downloaded on 1 February 2021)***

References:

Infographics (https://wwf.hu/letoltes/infografikak/1/; ***downloaded on 1 February 2021)***

WWF Hungary's awareness-raising posters (https://www.facebook.com/wwfhungary/photos/a.211253952497/10156833795202498/?type=3&theater; ***downloaded on 1 February 2021)***

Let's be honest: Hungary is not a water power (https://qubit.hu/2018/04/05/ontsunk-tiszta-vizet-a-poharba-magyarorszag-nem-viznagyhatalom; ***downloaded on 1 February 2021)***

BISEL. Nature conservation in rubber boots (https://bisel.hu/; ***downloaded on 1 February 2021)***

Magosfa Alapítvány–Pangea Egyesület szerk. (2016) *Mindennapra kisebb (öko)lábnyom*. [Smaller (carbon) footprint every day] Magosfa Alapítvány. Vác (http://sustainableproject.net/?lang=hu; ***downloaded on 1 February 2021)***

Micro Plastic Puzzle (Parányi Plasztiktalány) project (https://mikromuanyag.hu; ***downloaded on 1 February 2021)***

Tisza PET Cup (www.petkupa.hu; ***downloaded on 1 February 2021)***

Sebastiao Salgado , one of the most famous photographers of our time, was born 75 years ago (https://maimanohaz.blog.hu/2019/02/08/75_eve_szuletett_sebasti_o_salgado; ***downloaded on 1 February 2021)***

III. RECOMMENDATIONS FOR LESSON PLANS

Lesson 1

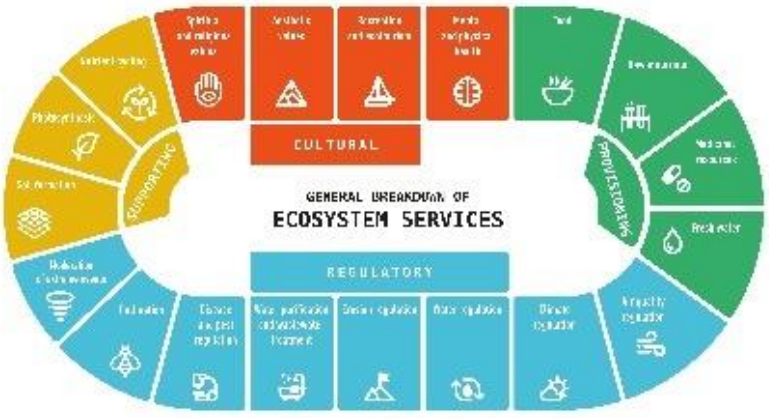
Topic of the lesson: Nature's values

Time required: 1 lesson

Pedagogical objective: The aim of the activity is for the students to:

- learn about nature's values through ecosystem services,
- be able to identify and organise ecosystem services by studying an ecosystem.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Raising awareness of nature's values, message of the Gaia hypothesis.	Recommended text of the textbook: '*Your interest, your life*' or '*Even Velcro!*' A discussion on the topic based on the text to engage the students. Additional task: Check out the Gaia hypothesis and the work of James Lovelock.	frontal individual task: processing text independently.	textbook, laptop/computer, projector
5 minutes	Understanding the concept of ecosystem services	Textbook text: Ecosystem services. Illustration: show a diagram illustrating ecosystem services from the textbook in a PPT, or view it in the textbook.	frontal teacher presentation, explanation	textbook, laptop/computer, projector



20 minutes	Deepening the topic of ecosystem services, making infographics	Solving the *Nature served on a plate* workbook exercise individually.	individual work	laptop/computer, projector, paper, writing instruments, laptop/computer/smartphone
15 minutes	Summary of the knowledge gained	Presenting the infographic of the selected student, and evaluating it on the basis of the criteria given. Homework: Workbook exercise: *Making a bottle garden: how to model a self-sustainable ecosystem?*	Joint assessment presentation for everyone and debate	laptop/computer, projector, assessment tool

SEN recommendations

When organising group work, it is advisable to form mixed groups. The students with special educational needs should be in different groups so that others can support them.

The tasks and the texts to be read can be tackled in all SEN groups. For students with learning disabilities, working in small groups or pairs should be preferred to independent study of additional material (Gaia hypothesis and the work of James Lovelock). This material can also be presented to them by other pupils.

For pupils with reduced mobility, the use of necessary aids is allowed, e.g. special computers, tablets and programs, depending on the degree and nature of the disability, taking into account the recommendations of the expert opinion and the advice of the somatic educator.

Making a bottle garden can be difficult for some students with reduced mobility. If the student cannot be supported in this task at home, ask classmates to follow the making and maintenance of other people's bottle gardens online or in person.

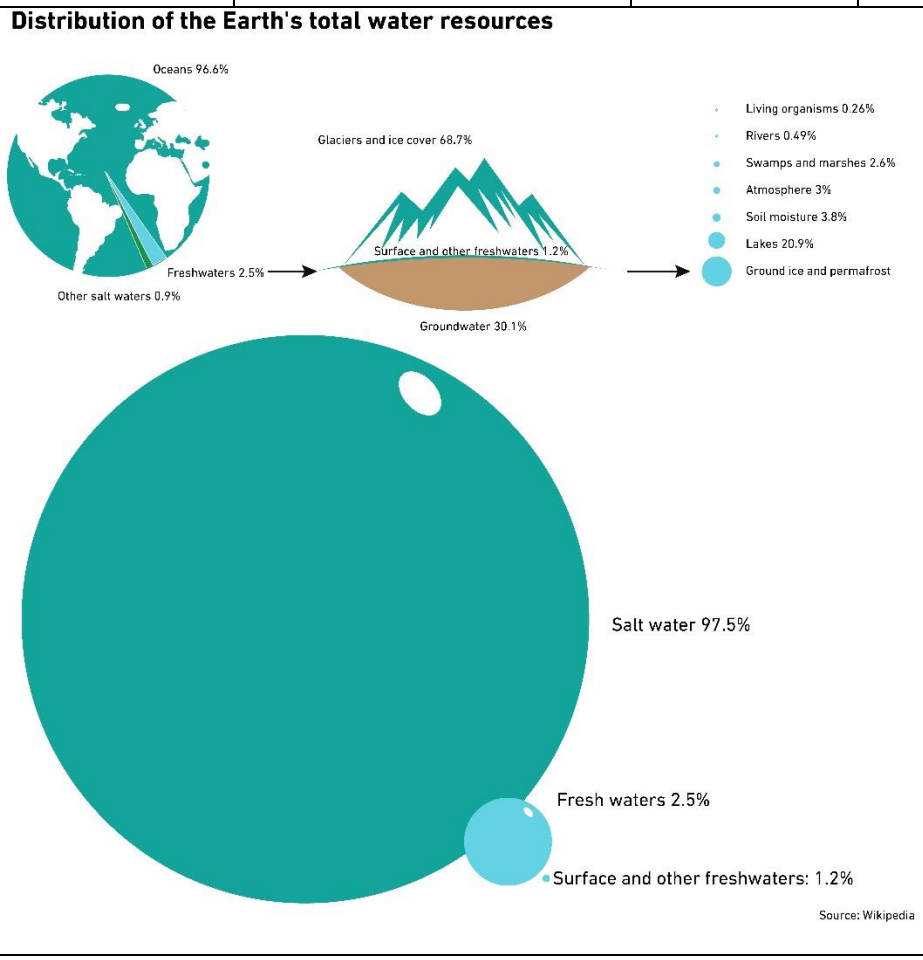
Lesson 2

Topic of the lesson: The James Bond phenomenon

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to teach students about humankind's relationship to nature, using examples, both good and bad.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	The James Bond phenomenon: our water is scarce on a global scale, with only 0.007% of the total water easily accessible.	Discussion of the projected diagram below:	frontal presentation, discussion	laptop/computer, projector



		Source of the diagram: https://qubit.hu/2018/04/05/ontsunk-ti-szta-vizet-a-poharba-magyarorszag-nem-viznagyhatalom Some points for the discussion: – Where are the Earth's fresh-water resources located? – Why does freshwater need protected? Why is salt water undrinkable?		
15 minutes	Humans-nature re-lationship – good and bad examples	Students prepare in advance with presentations on the topic using articles from the textbook: – The world of grasses – Good tourist, bad tourist – Microplastics everywhere	student presenta-tions, 3x5 min	textbook, lap-top/computer, projector
20 minutes	Writing useful ad-vice, making post-ers, planning tours (based on work-book exercises)	Workbook exercises: – Food without microplastics – Planning an ecotourism tour – Nature is counting on you! Website recommended for poster design: http://ecolounge.hu/art/tar-sadalmi-ugyek-sokkolo-plakatjai	small group task, each group can choose from a set of tasks, but each task should be completed by more than one group.	workbook, pa-per, writing in-struments
5 minutes	Conclusion	Presentation of small group tasks, comparison of work of groups dealing with the same topic. Peer evaluation under teacher guid-ance	frontal presentation of the small groups' work, display on a notice board	laptop/com-puter, projector

SEN recommendations

Allow for group work in preparation for student performances.

In the case of pupils with special educational needs, the voluntary nature of verbal expression can be an im-portant consideration. For students with certain speech impairments, hearing impairments or speech disor-ders due to reduced mobility, more time should be provided for the presentation and the small group exer-cise.

Developing and maintaining the communication and social skills as well as the self-confidence of pupils with special educational needs is an important educational task, so you should be open to opportunities for them to make presentations too. To do this, you should create suitably open and safe communication situations.

When designing posters, take into account the special needs of pupils with reduced mobility and those with fine motor skills.

Lessons 3-4

Topic of the lesson: Field research and data processing

Time required: 2 lessons

Pedagogical objective: The aim of the lesson is to survey a natural habitat in a field lesson through an exploration exercise. This way, students can learn about the eternal laws of nature through their own experiences, recognise human interventions that damage nature, and find ways to restore the biocenosis of an area.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
The first lesson takes place in the field, not in the school, so the journey from school to the field and back is not part of the lesson.				
15 minutes	Preparing for the field study: forming groups, assigning tasks, discussing the field study data sheet	Forming groups based on the "Surveying a natural habitat – a field exploration exercise" workbook task. The teacher should set up the groups so that each of the following roles is fulfilled by the group members: a) *minute-taker*: likes to take notes, he or she will enter the data in the data sheet; b) *chief organiser*: keeps an eye on the timetable, and makes sure everyone does their job; c) *researcher*: likes to investigate everything thoroughly, and get to the bottom of things; d) *IT specialist*: likes to fiddle with their phone; he or she will take the photos, and use the app to identify different plant and animal species.	frontal discussion (field exercise)	workbook
30 minutes	Field study (for more help see the exercises below)	Data collection during field research using the *Natural Habitat* data sheet. It is important that all students are involved in the field work. This should be the responsibility of the teacher, as well as the chief organiser from the group. Discuss with the students that they should try to answer all the	small group field work (The small groups work independently, but they can ask the teacher for help if necessary.)	workbook, pencil, smartphone, notebook, field identification sheets (app or laminated identification keys or books)

		questions, and if they can't, they should explain why. Ask the students to look into the questions they were unable to answer during the field observation. Discuss the presentation of the field exercise experiences – ppt, poster, video, etc. The groups can present the results in the same or different ways; decide with the students in advance. Discuss the criteria for evaluating the presentations too. Proposed session: 1. Collecting basic data – can be done before the actual field visit. 2. General features of the habitat 3. Flora 4. Fauna 5. Personal impression – in addition to your grade in the workbook, please also briefly describe what you liked and disliked. What might need to change.		
The second lesson takes place in the classroom.				
30 minutes	Summary and evaluation of data	Each group prepares their presentation as discussed during the field work preparation. The teacher should monitor the work, and give advice if necessary. Point out that all aspects should be included in the presentation, and at the end, they should add their own comments, and identify the interventions that may be necessary to protect nature.	small group task	workbook, textbook, laptop/computer, projector, writing instruments, paper, maps
15 minutes	Conclusion	Presenting small group exercises. This can be done by a member of the group, or each member can give a short presentation based on their own task. The presentations are also assessed by a member of each group, both in terms of content, form and aesthetics. The teacher also evaluates the presentations. The best ones	small group presentation	workbook

		should also be presented to the school community.		

SEN recommendation

Field work is a good opportunity for students with attention difficulties, hyperactivity and other mental disorders to show their creativity, independence and willingness to act. This type of activity is a great way to develop their talent, so make sure you pay attention to this when organising the groups. It is also important to ensure that pupils with similar diagnoses are not placed in the same group, as the many ideas, movements and activities that naturally arise from their special educational needs can hinder the successful implementation of the task.

For students with behavioural problems, it is essential to clarify the rules of conduct and behaviour during the exercise in advance. If possible, they should be placed in a group where the other members of the group can "support" him or her with their stable, positive behaviour. If you find it necessary, a teacher or another adult should accompany this group.

The task of the minute-taker may only be assigned to a student with dysgraphia or dysorthography if they agree to take on this task.

Students with autism spectrum disorder should be given a written outline of the tasks to be carried out, the location, etc. before the field study (if possible, in the previous class or the day before). When forming groups, they should be placed in a group with students they can accept and work with. It is essential to set out the rules of conduct and behaviour during the exercise. If there is a change in the task, tell the student in advance, and ask the group members to do the same.

For a group with a pupil with reduced mobility, find a location that the pupil with reduced mobility can approach. If there is no such location, they should take part in the field study online, following the tasks of their group, in a role where they can be a useful member of the team. If this is not possible either, have the student do an alternative task related to the topic, or follow the work of all the groups, and present a report on this as an outside observer.

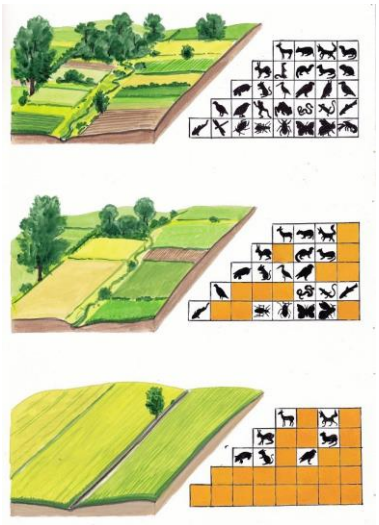
Lesson 5

Topic of the lesson: Exploring nature and nature conservation

Time required: 1 lesson

Pedagogical objective: The aim of the activity is for the students to:

- learn the rules of exploring nature,
- recognise the importance of nature conservation laws and the details of how they can be used in everyday life, by analysing practical examples and life situations.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Discussion on nature conservation	Discussion based on the projected diagram: – What process can be observed in the diagrams? Why is this happening? – What are the consequences of this process? – Can we do anything about it? What and how? – How does this relate to nature conservation?  Source of the diagram: https://www.facebook.com/zsoldosmarton/photos/biodiverzit%C3%A1s-cs%C3%B6kken%C3%A9se-a-nagy%C3%BCzemi-n%C3%B6v%C3%A9ny-termeszt%C3%A9s-hat%C3%A1s%C3%A1ra-tempera-pap%C3%ADrra-e/2242848349104244/	frontal	laptop/computer, projector
15 minutes	Learning about the rules of exploring	Online or library research on the topic. The instructions for the	working in pairs	workbook, textbook, laptop/computer,

	nature and the nature conservation laws	workbook exercise "*The monetary value of nature*" are helpful. Students work in pairs to solve the workbook exercise by working with the texts they found during their research and the texts in the textbook: – *A gift of wildflowers?* – *1 million forints on a 50-forint coin*		projector, workbook
10 minutes	Evaluation	Monitoring and evaluating the results of research work.	frontal	workbook, textbook, laptop/computer, projector, workbook
10 minutes	Preparation of a draft community action plan for nature conservation.	The students make a plan and a calendar of the times during the school year when they have the opportunity to participate in a nature conservation project in their area.	small group task	writing instruments, paper
5 minutes	Conclusion	Homework assignment: study the work of NGOs in the field of nature conservation, e.g. Who are the PET pirates? or study the text "Who was Sebastiano Salgado?" in the textbook.	frontal	workbook

It is advisable to carry out the workbook exercise *Nature conservation in action! – Act together to protect nature!* as an extra-curricular activity (working together). Before the DIY activity, talk to the pupils about who has ever seen a bee hotel, or who "operates" a birdfeeder at home. Inform students about local NGOs that organise events in their area where they can make such nature conservation tools (e.g. the local branch of the Hungarian Ornithological and Nature Conservation Society, MME).

SEN recommendations

For pupils with behavioural problems and autism spectrum disorder, it is important to discuss before the library research – and if necessary write down – the rules of conduct and behaviour expected in the library. If you can, choose a partner who is sure to follow the rules, and can warn their classmate. However, it is also important to make it clear that in the case of any confusion, they are not responsible for the behaviour of their classmate.

Give dyslexic pupils more time or fewer tasks if reading is needed for the exercise. When evaluating the written assignments of dyslexic, dysorthographic and dysgraphic students, do not assess spelling, but help to ensure that no errors remain in the completed exercises and presentations.

When carrying out the *Act together to protect nature!* exercise, be aware of the disabilities of learners with reduced mobility. If tools are used in this task, it is essential to draw attention of pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder to the rules of using such tools.

IV. Recommendations and suggestions for the exercises in the textbook and workbook

a) Building a bottle garden: how to model a self-sustaining ecosystem?

Topic, subject	Modelling a self-sustaining ecosystem
Position of exercise in teaching process	Building a bottle garden is primarily a home project, but it can also be done in a school workshop.
Time required for exercise (minutes, hours, days)	40-60 minutes
Prior knowledge and definitions needed for the exercise	Vapour condensing on the side of the bottle waters the plants, which use the light to photosynthesise, in other words they generate oxygen from the carbon dioxide in the bottle. At night they use up some of the generated oxygen.
SEN recommendation	Provide students with learning or attention difficulties, or certain speech and hearing impairments with a printed or digital glossary where they can look up the meanings of the terms. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms.
Aim of the exercise	The goal is to build a bottle garden which is self-sustaining provided appropriate humidity, light, oxygen and water are supplied.
Competences that the exercise develops	Recognising and understanding interrelationships Analysing complex systems Reflecting on the relationship of the system parts to each other and to the whole
Tools needed for the exercise	Workbook for a precise description of the task. Transparent glass container (e.g. bellied wine bottle, flip-top bottle, indoor greenhouse, jam jar), small gravel, activated charcoal, peat-based potting soil, sticks, ornamental plant (small or low, and prefers a moist, humid environment), watering can or funnel (depending on

	the size of the bottle). Some suggested plants: string of hearts (Ceropegia woodii), fittonia (Fittonia spp), begonia (Begonia spp), ivy (Hedera helix), spike moss (Selaginella spp), spider plant (Chlorophytum comosum 'Vittatum'), aluminium plant (Pilea cadierei).
Internet resources for students	https://gondozasmentes.hu/pages/florariumok
Recommended resources for teacher preparation	https://gondozasmentes.hu/pages/florariumok

INSTRUCTIONS FOR THE EXERCISE

Create your own self-sustaining ecosystem.

Observe the bottle garden over the next few days.

From the amount of vapour condensing on the wall of the bottle you can conclude whether the plants are receiving too much or too little water. If the side of the bottle is too moist, let some air in, or add a few drops of water if it hasn't started to humidify. Once a balance has been achieved, you won't need to intervene again.

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Methods	Tools	Notes
5 minutes	Disinfect the container to ensure that no bacteria or fungi remain in it.	Disinfection	transparent glass container	SEN recommendation The description of the main steps for solving the task is very useful for learners with special educational needs. For some students, e.g. with autism spectrum disorder, it can be frustrating to have such precise time frames for each step. In this case, specify time slots, e.g. 5-10 minutes. However, for some students, it is very good to have time limits because they help them complete the tasks.
5-10 minutes	Mix the gravel with the activated charcoal and put it at the bottom of the bottle in a roughly 2-3 cm layer.	Soil preparation	small gravel, activated charcoal	
5-10 minutes	Add peat-based potting soil on top, 5-10 cm, depending on the size of the container.	Soil preparation	peat-based potting soil	
5-10 minutes	Form a small hole for the plant, then place it in, use sticks to help if needed.	Planting	sticks, ornamental plant	
5 minutes	Water through the funnel with as much water as needed to make the soil wet.	Watering	watering can or funnel	
5-10 minutes	Then close the bottle with a cork or cover the top with a plastic plate.	DIY	cork or plastic plate	
10 minutes	Place in a spot that is not directly in the sunshine.			

b) Surveying a natural habitat – field exploration exercise

Topic, subject	Field exploration exercise
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	Lessons: 2 x 45 minutes Preparation: 30 minutes
Prior knowledge and definitions needed for the exercise	Prior knowledge needed: - natural habitat, - knowledge of plants and animals, - field studies, - data evaluation, - using digital applications, - making presentations.
Aim of the exercise	The goal of this field exploration is to survey a natural habitat, which allows students to learn about the eternal laws of nature through their own experiences, to identify human interventions that damage nature, and to find ways to restore the biocenosis of an area.
Competences that the exercise develops	Recognising and understanding interrelationships
Tools needed for the exercise	Natural habitat data sheet (workbook), jam jar (for capturing animals), pH paper, rubber boots (if possible), filter, plastic tray, magnifying glass, bucket, string, camera or smartphone. In order to identify plants and animals in the habitat, students should use a smartphone app, identification keys or a field guide.
Internet resources for students	https://bisel.hu/ https://www.novenyzetiterkep.hu/termeszetessegmero
Recommended resources for teacher preparation	The methodology for measuring the natural condition of a habitat should be used when preparing and solving the task. In the 1980s, Ferenc Németh and Tibor Seregélyes established a five-point scale to determine the natural condition of a habitat and the extent of human intervention. This method, which has since become widespread in botanical and nature conservation practice, requires thorough knowledge of plant species, their characteristics and vegetation structure. The categories of the Németh-Seregélyes scale, which has been in use for 40 years, are: – totally degraded state (1)

	– heavily degraded state (2) – moderately degraded state (3) – semi-natural state (4) – natural state, or a state that can be considered as natural (5) Source: Biró, M. - Molnár, Zs. (2011). *Milyen természetes a környezetünk? Terepi Adatlap a MÉTA Természetesség-mérőjéhez* [How natural is our environment? Field Data Sheet for the MÉTA Naturalness Measurement]. Hungarian Society for Environmental Education, Vác (https://www.okologia.mta.hu/node/2732; downloaded on 1 February 2021) Recommended identification keys: https://bisel.hu/UserFiles/hatarozolap.pdf https://bisel.hu/UserFiles/File/szineshatarozo.pdf https://bisel.hu/ https://www.okologia.mta.hu/node/2732

INSTRUCTIONS FOR THE EXERCISE

With the class, choose an easily accessible natural habitat near the school, and carry out field observations there. Choose an area where the natural vegetation and animals have become endangered due to human disruption/intervention, and the balance of nature has been visibly upset.

MAIN STEPS TO SOLVE THE TASK

Methodological advice for conducting the field exercise

All fieldwork requires prior preparation. We have summarised this in a few points, and propose the following preparations:

- Visit the field sites you plan to explore with your students.
- Plan how and in how much time you can get to the field with your students.
- Measure the time it takes to complete the tasks, try them out.
- Plan the field activity so that tasks involving movement and thinking alternate/follow each other in a balanced and complementary way.
- Make a list of the tools you need, and inform students about the right equipment. Recommended permanent equipment: comfortable and closed hiking shoes, notebook/workbook, pencil (better than a pen because it does not smudge in water), map of the area, identification keys for animals and plants, preferably smartphones for photography.
- Before the activity, prepare the students by telling them in advance where they will go, what they will do and how long the activity will last.

For your teaching preparation, we recommend studying the websites related to the topic, as well as the concepts, plants and animals related to each theme. It is advisable to check and correct the solutions to each task with your students immediately after completing it.

Depending on the group and the location, you can also plan field activities with different schedules. For example, if you have more time for field work, we suggest the following schedule:

a) Introduction, game to get students in the mood (10-15 minutes)
b) Forming groups or pairs, assigning and discussing the task, defining the area for working independently, dividing groups by area (5-10 minutes)
c) Solving tasks independently (20-25 minutes)
d) Discussing solutions to the problem (5-10 minutes)
e) Assigning and conducting another task (30-40 minutes)
f) Summary of knowledge gained in the field (10 minutes)
g) Cool-down game (10 minutes)

c) Nature conservation in action! – Act together to protect nature!

Topic, subject	Nature conservation in practice
Position of exercise in teaching process	The exercise provides help/support with processing content.
Time required for exercise (minutes, hours, days)	40-60 minutes
Prior knowledge and definitions needed for the exercise	-
Aim of the exercise	Students gain experience of how to make nature conservation tools.
Competences that the exercise develops	Recognising and understanding interrelationships.
Tools needed for the exercise	workbook, black adhesive paper, scissors, glue, sheet of paper, pieces of wood, nails, hammer, reed, wire, saw
Internet resources that students can use (for classroom and homework)	https://www.mme.hu/darazsgarazs_keszites https://www.mme.hu/oduk_es_koltoladak
Recommended resources for teacher preparation	https://www.mme.hu/darazsgarazs_keszites https://www.mme.hu/oduk_es_koltoladak
INSTRUCTIONS FOR THE EXERCISE	
Make and place stickers on your window to stop birds flying into the glass in spring. Build a birdfeeder or birdhouse. Put it on the window sill, patio or in the garden. Birds feeding from your birdfeeder are more likely to nest in your garden, this way you can promote biological protection against pests in your garden.	

Use bird identification keys to find out which birds nest in the birdhouse and what species come to the feeder.

Make a bee hotel in your garden for pollinating insects to move into. To feed the insects, plant melliferous wild flowers in the garden.

Using an insect identification key, identify:

- what insects move into the hotel, and
- what insects visit the wild flowers.

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Methods	Tools	Notes
15 minutes	Fit the laths as a border on the board that serves as the base, and fix them with nails.	Measurement Cutting Nailing	1 plate, 25x25cm and 10 mm thick, for the bottom of the feeder, 4 laths 25 cm in length, saw, nails and hammer	
15 minutes	In the second step, fix the laths that support the roof. If you want an enclosed birdhouse, you will also need to fix side walls.	Measurement Cutting Nailing	4 laths, 3x3cm and 20cm long, to support the roof, saw, nails and hammer	
20 minutes	The easiest way is to put a flat roof on it. If you want to make a tent-roofed feeder, you have to fit two laths together at an angle to form a support (you have to cut the edges off them at an angle). Then you need to nail on the two roof panels.	Measurement Cutting Nailing	2 plates for the roof, 35x20cm and 10 mm thick, saw, nails and hammer	
10 minutes	You can hang the feeder on a tree or place on a windowsill if it is sturdy enough. Don't forget to fill it with birdseed.	Installation	thick string	

d) Nature served on a plate

Topic, subject	Deepening the topic of ecosystem services
Position of exercise in teaching process	The exercise provides help/support with processing content.

Time required for exercise (minutes, hours, days)	20 minutes
Prior knowledge and definitions needed for the exercise	An infographic is a series of visual diagrams presenting a topic with images and short explanations, using the diagrams in the textbook as a starting point.
Aim of the exercise	Understanding ecosystem services
Competences that the exercise develops	Recognising and understanding interrelationships Analysing complex systems Reflecting on the relationship of the system parts to each other and to the whole
Tools needed for the exercise	laptop/computer, projector, paper, writing instruments
Internet resources that students can use (for class-room and homework)	https://www.hogyankell.hu/Info-grafik%C3%A1t_k%C3%A9sz%C3%ADteni
Recommended resources for teacher preparation	https://wwf.hu/letoltes/infografikak/1/

INSTRUCTIONS FOR THE EXERCISE

Students should explore how a biocenosis contributes to the everyday life of humanity. In groups, make an infographic about the ecosystem services of a biocenosis.

MAIN STEPS TO SOLVE THE TASK

Form groups to present ecosystem services. Each group deals with different ecosystems. We propose analysing the biocenosis of meadows, forests and waterfronts. Each group chooses a biocenosis and presents its functioning according to the following criteria:

- provisioning service,
- supporting service,
- cultural service.

The groups should also use a visual method of their choice (e.g. an infographic) to demonstrate the functioning of the biocenosis.

One possible example is forest ecosystem services:

a) Provisioning services
   - timber,
   - food (e.g. mushrooms, game meat),
   - industrial and pharmaceutical raw materials,
   - regulatory services,
   - water retention, water purification,

- CO_2 capture,
- absorbing dust, pollutants,
- provision of habitats,
- reduction of erosion,
- local climate regulation,
- flood protection,
- noise protection.

b) Supporting services
- soil formation,
- nutrient cycling.

c) Cultural services
- tourism,
- recreational,
- education,
- artistic needs.

Recommended website for infographics: https://www.hogyankell.hu/Info-grafik%C3%A1t_k%C3%A9sz%C3%ADteni (downloaded on 1 February 2021)

e) 5-minute quiz

Name of the role play, project or complex task	5-minute quiz

Source	—
Position of exercise in teaching process	The game helps you to engage the students.
Time required for exercise (minutes, hours, days)	5 minutes
Prior knowledge and definitions needed for the exercise	Not necessary.
Aim of the exercise	The students' knowledge is tested with quiz questions. Questions are asked orally, and anyone who knows the answer can respond.
Competences that the exercise develops	Memory Writing a text Logical thinking
Tools needed for the exercise	Not necessary.
Where	in the field
Preparing the task	Write down questions: – Why do streams flow and lakes stand still? – What species of animal can live in this place? List as many as you can. – How do animals breathe in water and on land? – What is photosynthesis? – What degradation processes are there in nature? – Which watercourses do the springs use to reach the seas? – How can natural habitats be protected? – Where did drinking water used to come from? – How does drinking water get into homes today?
Internet resources for students	—
Recommended resources for teacher preparation	—

f) Where did the poet sit?

Name of the role play, project or complex task	Where did the poet sit?
Source	—

Position of exercise in teaching process	The game helps you to engage the students.
Time required for exercise (minutes, hours, days)	20 minutes
Prior knowledge and definitions needed for the exercise	poems about nature, quotes from poems
SEN recommendation	Read the poems to dyslexic students, or have their classmates do so, or they should listen to them on their mobile phones using a free platform.
Aim of the exercise	We hand out different quotes from poems to the students, and they have to find a similar place where they think the poet might have written them.
Competences that the exercise develops	Reading comprehension Logical thinking
Tools needed for the exercise	quotes from poems
Where	In the field
Preparing the task	The quotes from poems should be printed on paper.
Internet resources for students	Not necessary.
Recommended resources for teacher preparation	Search for poems that relate to the topic.

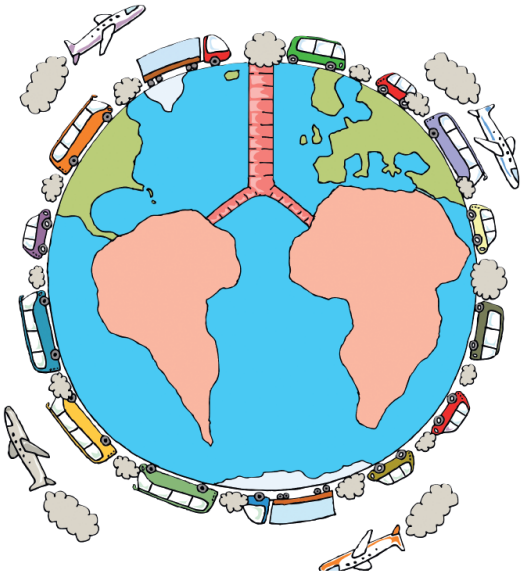
IV. Other ideas for working with the textbook

Mini safari	Instructions: – In a grassy area, form a circle with string, with a radius of about 20 cm. Take a good look at the creatures in the small circle. Make a list of what species of plants and animals you found. – You can do the same with a handful of forest soil. Lay the soil out on a white plastic tray or sheet of paper. – Dip a jar into flowing water and collect some. Use a magnifying

	glass or microscope to examine the tiny organisms.
Trees reaching up to the sky	Instructions: – During your exploration, look for the oldest tree in the area. Get several of you to stand round the tree, and take a photo or video of it. – Using your tools, measure the circumference of the trunk. – Try to determine the height of the tree.
What's under the stone?	Instructions: – Turn over a big stone. What did you find underneath? Write it down. – You can also take a photo or draw a picture of it.
The forest food chain, i.e. the great bio-war	The most basic relationship between living things in the biocenosis is feeding. We can model this by playing a game. Preparations, tools needed: using the list of organisms below, make headbands (like in the children's activity game War of Numbers), with consumers in green, herbivores in red, predators in blue and decomposers in black. A more difficult version is when all the signs are the same colour, and players have to decide what each animal eats. Since there are two teams, we need to distinguish them, so the easiest way is to frame the names in different colours. – Producers: sessile oak, common hawthorn, checkerberry, hollowroot, ramson, male fern, Lily of the valley, yellow anemone, wood cow-wheat, traveller's joy, common dog-wood, warted spindle, common lungwort. – Primary consumers (herbivores): stag beetle, wood mouse, red deer, forest bee, wood mouse, deer, fat dormouse, peacock butterfly (parasite: common white wood rot). – Secondary consumers (animals that eat animals): northern white-breasted hedgehog, long-eared owl, red fox, great spotted woodpecker, deer tick. – Decomposers: red forest ants, soil bacteria, earthworms, giant parasol mushroom, fly agaric). The rules of the game are similar to those of the children's activity game War of Numbers, each team starting from a different position with the aim of capturing the other team's flag. Rules for reading the headbands: Herbivores can only read plants, carnivores can only read herbivores, plants can only read decomposers, and decomposers can read everyone.

ON THE ROAD?

The price of transport



A guide to working with the On the Road? magazine

Purpose of this issue	Objectives of the framework curriculum: - Understanding the main environmental problems caused by transport, such as air pollution and environmental noise. - Mapping the domestic environmental impact of waste from vehicles (production, operational and end-of-life waste). - Understanding the advantages and disadvantages of different traditional and alternative transport modes. - Learning how to calculate direct prices and incidental expenses of goods and products.
Time frame	5 lessons
Links within the textbook and between subjects	This topic forges close links with the chapters *Naturally is best!* and *I feel at home in my home*. Connections with other subjects in grades 9-10: a) Biology - Emissions of pollutants and their impact on the environment such as global warming or climate change. b) Chemistry

	- Renewable and non-renewable energy sources, the environmental impact of different elements and chemicals. c) Geography - Use of maps, the functioning of geo-information systems (GPS), climatic features, climate change, the economic role of energy sources, atmospheric pollution, global environmental problems. d) Digital culture - Using presentation software, searching for information on the internet.
Focus on skills development	The students: - can identify the environmental impacts of transport and traffic and estimate their extent; - can identify and implement changes that they can make themselves; - can recognise that the emissions associated with the transport of goods or products are not directly and fully reflected in the price of a product; - understand that they can make conscious choices about the products they buy, and therefore influence the level of associated emissions; - understand the concepts of food miles and ecotourism. - know local values and products and are able to recognise their economic and ecological importance.

METHODOLOGICAL RECOMMENDATIONS FOR WORKING WITH THE TOPIC

The aim of the subject and textbook is not to impart lexical knowledge but to develop personal attitudes and skills. Accordingly, it is recommended that the content of this issue be worked on primarily using cooperative techniques and project methods, but of course, a variety of other methods can also be implemented.

Transport and the delivery of goods have a major impact on our daily lives: we all experience the heavy car traffic, deteriorating air quality and noise pollution every day. The magazine aims to identify and recognise transport-related problems (direct environmental as well as indirect environmental and social problems) as well as develop, present and promote solutions that anyone can adopt to reduce the damage.

The exercises in the workbook help you to work through the issue.

Give students the opportunity to express and share their opinions and ideas with their classmates. In the teaching and learning process the students should be the leaders. Through their own observations, experiences and insights, we should shape their attitudes inductively and

deepen their understanding and application of the necessary concepts. Encourage your students to take action, and support them to inspire others to take action too. Raise your students' awareness of the importance of individual choices in mitigating environmental impacts.

II. Suggested literature and resources for teacher preparation and working with material

Brainy Backpackers website, 17+ tips for responsible tourism (https://brainybackpackers.com/responsible-tourism/***; downloaded on 1 February 2021)***

Duray, B. (2016). Fenntartható turizmus, felelős vidékfejlesztés* [Sustainable tourism, responsible rural development]. *(https://www.researchgate.net/publication/322887921_FENNTARTHATO_TURIZMUS_FELELOS_VIDEKFEJLESZTES***; downloaded on 1 February 2021)***

Interpreting the concept of food miles and ways to reduce them: https://gasztrohos.blog.hu/tags/%C3%A9lelmiszer-kilom%C3%A9ter ***(downloaded on 1 February 2021)***

Invasive species: https://www.mme.hu/khvsz/idegenhonos-keteltu-es-hullofajok ***(downloaded on 1 February 2021)***

Cycling: https://www.kerekparosklub.hu/kisokos ***(downloaded on 1 February 2021)***

References

Bioblitz – *a városi, közösségi élőhelyfelmérésről*: [Survey on the urban community habitat]: http://fishingonorfu.hu/nemzene/58/wwf-bioblitz (***downloaded on 1 February 2021)***

Brainy Backpackers website, 17+ tips for responsible tourism (https://brainybackpackers.com/responsible-tourism/***; downloaded on 1 February 2021)***

Duray, B. (2016). Fenntartható turizmus, felelős vidékfejlesztés [Sustainable tourism, responsible rural development]. (https://www.researchgate.net/publication/322887921_FENNTARTHATO_TURIZMUS_FELELOS_VIDEKFEJLESZTES; ***downloaded on 1 February 2021)***

Concept and interpretation of food miles: https://gasztrohos.blog.hu/tags/%C3%A9lelmiszer-kilom%C3%A9ter *(downloaded on 1 February 2021)*

Traffic calming, sustainable transport (http://www.promontoriumcasino.hu/wp-content/uploads/tanulmany_a-varosi_forgalomcsillapitas_lehetosegei.pdf; ***downloaded on 1 February 2021)***

Geocaching: https://www.geocaching.hu/ *(downloaded on 1 February 2021)*

Hajnal, K, Dr.–Hársas, P (undated) A felelős turizmus elméleti kérdései és gyakorlati példája* [Theoretical issues and practical examples of responsible tourism] (**http://balkancenter.ttk.pte.hu/tarsadalom/letoltes/Kodolanyi.htm; ***downloaded on 1 February 2021)

Online platform for reporting illegal dumps (mobile phone app): https://hulladekvadasz.hu/illegalis-hulladek-bejelento/ *(downloaded on 1 February 2021)*

Invasive species: http://www.hermanottointezet.hu/vvk-001 ***(downloaded on 1 February 2021)***

Invasive species: http://www.termeszetvedelem.hu/idegenhonos-invazios-fajok (***downloaded on 1 February 2021)***

Invasive species: https://ec.europa.eu/environment/pubs/pdf/factsheets/Invasive%20Alien%20Species/Invasive_Alien_HU.pdf ***(downloaded on 1 February 2021)***

Road traffic calming measures (http://www.sze.hu/~petocz/Kommunalis%20feladatok%202/Segedanyagok/tu1.pdf; ***downloaded on 1 February 2021)***

Smart city, future directions for urban development: http://okosvaros.lechnerkozpont.hu/hu ***(downloaded on 1 February 2021)***

Ecotourism, local products: http://kornyezetineveles.hulladekboltermek.hu/files/civ_szerv_okt/%C3%96koturizmus.pdf ***(downloaded on 1 February 2021)***

III. RECOMMENDATIONS FOR LESSON PLANS

Lessons 1–2

Topic of the lesson: The price of our travels

Time required: 2 lessons

Pedagogical objective: - recognising and identifying emissions from transport,
- learning and understanding the concept of carbon footprint,
- identifying the indirect environmental and social impacts of transport,
- identifying the link between emissions and environmental problems.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
Lesson 1				
10 minutes	The price of our travels	Reading and discussing the article *The price of our travels*: identifying and collating pollutants, linking pollutants to environmental impacts. Create a logical sequence or a network of connections	individual work reading comprehension frontal, discussion	textbook, board, chalk/board marker
3 minutes	Forming groups	To form groups, use the names of pollutants, write them down on post-its or other small sheets of paper, and distribute them randomly among the students. The groupings can be based on the colour of the paper or the names of the pollutants.	forming groups	colour post-its according to the number of students in the class
6 minutes	The environmental impact of transport	By analysing the second chart on page 53 of the textbook, compare each means of transport in terms of emissions and other environmental impacts. When analysing the chart, the students should recognise that different means of transport have different levels of emissions, but the speed and type of a vehicle also affect the emissions level.	small group work comparison, analysis, cause and effect analysis	textbook

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		It is also worth asking the following questions: - When travelling to Lake Balaton, is it better to drive at 90 or 130 km/h on the motorway? - What are the advantages and disadvantages of travelling at lower and higher speeds?		
6 minutes	The environmental impact of transport	Discuss with your classmates why less environmentally damaging means of transport are being introduced, and yet emissions from transport are increasing. Discuss the groups' positions together.	small groups in the same format as the previous exercise, discussion	-
10 minutes	Travel, but why and how?	It is useful to focus on alternative travel options during the discussion: - Have you ever wondered why parking spaces are built at railway stations, or why city centre streets are being turned into pedestrian zones? - How does difficult parking in busy city-centre areas relate to ever-increasing hourly parking charges? - Where has another cycle path been opened, or where is a roundabout being built on the main road? - What does it mean if the length of the bypass continues to be extended? - What does it mean if you choose environmentally friendly means of transport for your journey?	small groups, classroom work	-
10 minutes	Electric vehicles	Based on the textbook article *Electric cars, then and now*, collect arguments for and against electric cars.	small groups, classroom work, frontal, discussion	board, chalk/board marker, possibly post-its (instead of writing on the board)

<table>
<tr><th>Time</th><th>Block name, short description</th><th>Purpose of block, tasks to be completed</th><th>Working style, methods</th><th>Tools needed, preliminary preparation</th></tr>
<tr><td></td><td></td><td>The small groups should write their arguments on the board in the appropriate place as follows:
<table><tr><td colspan="2">E-cars</td></tr><tr><td>Pros</td><td>Cons</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table></td><td></td><td></td></tr>
<tr><td colspan="5">SEN recommendations
Reading and interpreting the article The price of our travels independently can be a problem for dyslexic learners. It is advisable to read and discuss the article in pairs.
When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to set rules for discussion to avoid conflicts. In solving the tasks, they can be given activity tasks that provide them with the opportunity to move around or maintain their attention under appropriate conditions.
Make sure that hearing-impaired students can hear every sentence of the debate clearly, and sit where they can see the debaters.
For pupils with learning or attention difficulties, memory problems or hearing impairments, it is recommended to continue the digital glossary they started in previous lessons, including, for example, emissions, carbon footprint, etc. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms.</td></tr>
<tr><th>Time</th><th>Block name, short description</th><th>Purpose of block, tasks to be completed</th><th>Working style, methods</th><th>Tools needed, preliminary preparation</th></tr>
<tr><td colspan="5">Lesson 2</td></tr>
<tr><td>5 minutes</td><td>Forming groups</td><td>Forming groups: go around the class and tell each student a means of transport that you ask them to remember, e.g. car, bicycle, train, boat, plane, bus, motorbike.

The students who were given the names of vehicles in the same group will form a team.</td><td>forming groups</td><td>-</td></tr>
</table>

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
35 minutes	The price of our travels	Solving exercise 1 (How "gassy" are we?) in a group.	working in groups set up under the previous point	Exercise 1 in the workbook
5 minutes	Evaluation of the tasks	Evaluation of the groups' work	frontal, evaluation	-
SEN recommendations Ensure that students with dyscalculia have access to the necessary aids when solving the exercise *How "gassy" are we?* Put them into a group where the other members of the group have no difficulty solving mathematical problems.				

Lesson 3

Topic of the lesson: Food mile/kilometre

Time required: 1 lesson

Pedagogical objective:
- recognising the emissions associated with the transport of food and goods, which are not directly visible and not necessarily reflected in the price of a product or service;
- realising that simply by paying attention we can easily reduce our food-related emissions.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Forming groups	Forming groups: line up the students, then give each student one of the cards with the name of the towns. Those with the same town name belong to the same team.	forming groups	For each group, make a number of cards with the names of the towns corresponding to the number of group members.
25 minutes	Food mile/kilometre	Use the articles *Buy local and everyone benefits!* and *Where does your chocolate come from?* to complete the exercise *Who has seen more of Europe? You or your hamburger?* in the workbook. The students should read the indicated articles in the textbook, and then do the exercise in the workbook.	group work, classroom work in groups set up under the previous point	workbook, textbook A calculator or mobile phone calculator can be used.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
15 minutes	Food mile/kilometre	Use the articles *Buy local and everyone benefits!* and *Where does your chocolate come from?* to complete the exercise *Buy local!* in the workbook.	group work, classroom work in groups set up under the previous point	workbook, textbook
SEN recommendations Reading and interpreting the articles *Buy local and everyone benefits!* and *Where does your chocolate come from?* independently can be a problem for dyslexic pupils or those with reading disabilities. It is advisable to read and discuss the article in small groups with cooperative learning techniques, making sure that dyslexic pupils read texts that are shorter and easier to understand. Using this cooperative learning technique, all students, including those with reading disabilities, can grasp the text as a whole. Ensure that students with dyscalculia have access to the necessary aids when solving the exercise *Who has seen more of Europe? You or your hamburger?* Put them into a group where the other members of the group have no difficulty solving mathematical problems.				

Lesson 4

Topic of the lesson: Ecotourism

Time required: 1 lesson

Pedagogical objective:
- recognising the environmental, social and economic impacts of tourism;
- understanding the potential of tourism to strengthen the local economy, and
- gathering information on ecotourism opportunities in and around their own town.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Forming groups	Forming groups with a puzzle: Each student is given part of a picture, and by finding the other parts they find their fellow group members. (Find as many pictures as the number of groups you need, then cut them into pieces corresponding to the number of group members. You can also cut the pictures to include one more piece than the	group formation, frontal	number of pictures corresponding to the number of groups

		number of the students in each group. That way you can use this extra piece to designate the place for each group.)		
35 minutes	Ecotourism	Use the articles *Travelling can be an experience for the planet too* and *Buy local and everyone benefits!* to complete the exercise *Become an ecotourist yourself!* in the workbook. Students can also use the internet to collect local attractions and other information for their ecotourism offer. It is a good idea to prepare the students for the task in advance, so they can present the local values based on personal experience (own videos, photos, etc.).	small groups, classroom work	workbook, textbook, internet access, mobile phone, paper, pencils, felt-tip pens
5 minutes	Evaluation of the tasks	Evaluation of the small groups' work	frontal, evaluation, peer evaluation	-

SEN recommendations

When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group.

Reading and interpreting the article *Travelling can be an experience for the planet too* independently can be a problem for dyslexic pupils or those with reading disabilities. It is advisable to read and discuss the article in small groups with cooperative learning techniques, making sure that dyslexic pupils read texts that are shorter and easier to understand. Using this cooperative learning technique, all students, including those with reading disabilities, can grasp the text as a whole.

Recalling the *Buy local and everyone benefits!* article can be difficult for pupils with learning or attention difficulties (memory problems), so it is a good idea to include a recall task.

When doing the *Become an ecotourist yourself!* exercise, be aware of the composition of the groups, and help them to work efficiently by determining the role of the SEN students in the group accordingly. For example, hyperactive students should have the opportunity to move, explore or use different phone applications. Dysgraphic students should not be asked to do writing tasks. Pupils with behavioural problems or autism spectrum disorder should have the opportunity to be active and creative, e.g. design a brochure, etc.

Lesson 5

Topic of the lesson: Smart city transport

Time required: 1 lesson

Pedagogical objective: - exploring the development opportunities of the town;
- raising awareness of the solutions offered by technology in the spirit of sustainability.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Forming groups	Forming groups with a puzzle: each student is given part of a picture, and by finding the other parts they find their fellow group members.	forming groups	See description of lesson 4.
40 minutes	Smart city transport	Using the articles *Electric cars, then and now*, *Cycle to school!*, *Speed-swim to work, skate to school* and *Animals at risk*, complete the exercise *This is what our smart city will look like!* in the workbook. (See method proposal below.)	group	paper, pencils, felt-tip pens, internet access
SEN recommendations Reading and interpreting the articles independently can be a problem for dyslexic pupils or those with reading disabilities. It is advisable to read and discuss the article in small groups with cooperative learning techniques, making sure that dyslexic pupils read texts that are shorter and easier to understand. The whole class should be made aware of the content of the articles read in the groups, so they can complete the project task *This is what our smart city will look like!* more successfully. If you can't read the articles in class, students should be given this as homework in the previous lesson. When doing the project task, be aware of the composition of the groups, and help them to work efficiently by determining the role of the SEN pupils in the group accordingly.				

IV. Recommendations and suggestions for the exercises in the textbook and workbook

a) How "gassy" are we?

Topic, subject	Transport modes and vehicle emissions; emission levels
Position of exercise in teaching process	The exercise provides help with processing content.

Time required for exercise (minutes, hours, days)	35 minutes
Prior knowledge and definitions needed for the exercise	Means of transport Sources of CO_2 emissions
Aim of the exercise	Students should be aware of the environmental consequences of their transport: the impacts and the extent thereof. They should develop and test solutions to reduce emissions from their transport. Recognising that their individual actions also have an impact on the community.
Competences that the exercise develops	Strategic competence Cooperation Critical thinking
Tools needed for the exercise	Calculator
Internet resources that students can use (for classroom and homework)	https://www.co2nnect.org/help_sheets/?op_id=602&opt_id=98&nmlpreflang=hu
Recommended resources for teacher preparation	https://g7.hu/elet/20190803/mit-merlegeljunk-egy-utazasnal-ha-tenni-akarunk-a-klimavaltozas-ellen/ https://dizelnavigator.hu/szen-dioxid-es-a-kozlekedes/ https://www.greenpeace.org/hungary/sajtokozlemeny/5449/a-globalis-uveghazgaz-kibocsatas-kozel-tizedeert-az-autoipar-felelos/ https://www.co2nnect.org/help_sheets/?op_id=602&opt_id=98&nmlpreflang=hu
INSTRUCTIONS FOR THE EXERCISE	
Students work in small groups (4-5 students). The groups are asked to collect individual travel solutions, and then estimate the CO_2 emissions of these travel modes. The groups should come up with options to reduce CO_2 emissions, and compare them with the proposals from the other groups. The class should draw up a list of options for reducing emissions, from which everyone can choose and try one out within a set timeframe.	
MAIN STEPS TO SOLVE THE TASK	

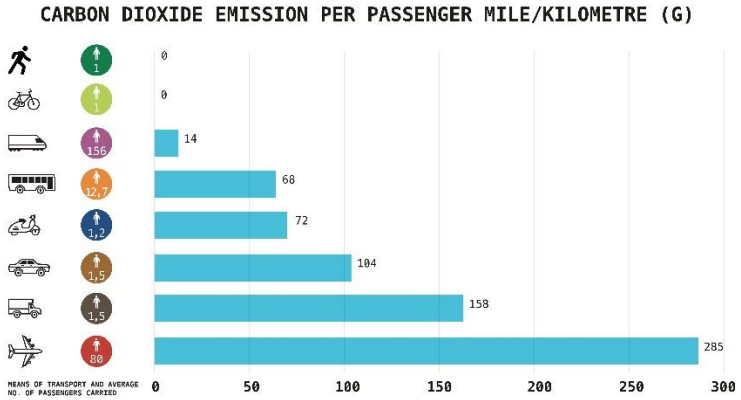
Time	Activity	Method, working style	Tools	Notes
2 minutes	Forming groups	-	-	Let the students form their own groups.
3 minutes	Collate the means of getting to school	Small-group work, discussion	-	-
5 minutes	Estimating their own CO_2 emissions	Working individu-ally	calculator	-

Proposal for solving the task

Split into teams of 4-5 people.

a) Discuss and make a note of how everyone travels from home to school every day. *(For example, in a group of 5, 3 students take a bus, 1 comes by car, and 1 walks.)*

b) Estimate your own and your group's CO_2 emissions using the graph below.



Travelling from home to school every day releases this amount of emissions:

- *e.g. 25km by bus: 25 km x 68 g = 1,700 g, twice per day to include returning home, i.e. 3,400 g CO_2/day,*
- *e.g. 20km by car: 20 km x 104 g = 2,080 g, twice per day to include returning home, i.e. 4,160 g CO_2/day,*
- *e.g. walking: 0 g CO_2/day,*

2 minutes	Estimating the group's CO_2 emissions	Small-group class-room work	calculator	-

Proposal for solving the task

Travelling from home to school every day releases this amount of emissions for the group:

- *e.g. 3 students by bus: 3 x 1,700 g + 2 students by car: 2 x 2,080 g + on foot: 0 g = 9,260 g CO_2/day,*
- *Twice per day to include returning home, i.e. 18,520 g CO_2/day.*

5 minutes	The groups compare their CO_2 emissions	joint discussion of results	-	-
3 minutes	Calculation of daily, monthly and annual emissions of the class	Frontal discussion, classroom work	calculator	-

Proposal for solving the task

c) Compare the CO_2 emissions of getting to school with other groups.

- Calculate the daily CO_2 emission of the whole class.
  E.g. for a class of 30 students, assuming similar emissions across groups, 6 x 9,260 g = 55,560 g CO_2/day/class.
- Calculate the monthly CO_2 emission of the whole class.
  For example, calculated over 20 working days: 20 x 55,560 g = 1,111,200 g CO_2/month/class.
- Calculate the annual CO_2 emission of the whole class.

Time	Activity	Method, working style	Tools	Notes
E.g. calculated over 10 months of an academic year: 10 x 1,111,200 g = 11,112,000 g CO_2/year/class.				
12 minutes	Developing an emissions reduction plan	Small-group class-room work	-	-
Proposal for solving the task d) In groups, develop a plan on how you could reduce your emissions. When ready, compare your ideas with the other groups. *For example, students who drive live in a place where they can take a train to school. Those taking a bus could cycle the entire distance in good weather or take a train then cycle.*				
3 minutes	My commitment to reduce CO_2 emissions:	Working individu-ally	-	-
Proposal for solving the task a) My commitment to reduce CO_2 emissions: *For example, a member of the group agrees to the following: I'll travel by train instead of the car, but in the good spring weather I'll also try to take a bicycle.* b) Try out the plan you have discussed with the group and the class for a week or a month. At the end of the trial period, check your CO_2 emissions and discuss whether the plan worked.				

b) Sustainable transport

Topic, subject	Calculating the carbon footprint of travelling and the options to reduce it
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	24 minutes
Prior knowledge and definitions needed for the exercise	Travel carbon footprint
Aim of the exercise	Identifying and collecting the components that determine your own carbon footprint. Calculating and interpreting the carbon footprint using a graph. Finding ways to reduce the carbon footprint of individuals and families.
Competences that the exercise develops	Systems thinking Critical thinking Strategic competence
Tools needed for the exercise	Calculator

Internet resources that students can use (for class-room and homework)	-
Recommended resources for teacher preparation	http://www.promontoriumcasino.hu/wp-content/uploads/tanulmany_a-varosi_forgalomcsillapitas_lehetosegei.pdf https://www.kerekparosklub.hu/kisokos http://www.sze.hu/~petocz/Kommunalis%20feladatok%202/Segedan-yagok/tu1.pdf http://www.kti.hu/kutatas/fenntarthato-kozlekedes-kutatokozpont/ https://ec.europa.eu/commission/presscorner/api/files/attach-ment/859467/ https://www.levego.hu/kapcsolodo-anyagok/mitol-lesz-fenntarthato-a-varosi-kozlekedes/

INSTRUCTIONS FOR THE EXERCISE

In small groups of 4-5 people, students should collect together their individual daily commuting patterns and calculate their carbon footprint. They should make proposals to reduce their carbon footprint, which should be discussed within the group. Students should brainstorm what other benefits, besides CO_2 emissions, could be gained from solutions that reduce the carbon footprint.

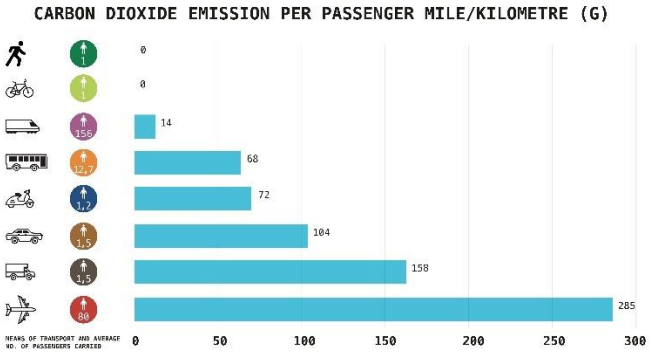
MAIN STEPS TO SOLVE THE TASK

Time	Activity	Method, working style	Tools	Notes
2 minutes	Forming groups	Frontal	-	Let the students form their own groups.
10 minutes	Gather together the family's daily travel patterns and cal-culating the carbon footprint of each mode, comparing the results with the group members.	Small group, work-ing individually	calculator	-
6 minutes	Brainstorming ideas to re-duce the carbon footprint	Small-group class-room work	-	-
6 minutes	Collecting arguments beyond emission reduction, while lowering the carbon footprint.	Small-group class-room work	-	-

Proposal for solving the task

a) Calculate your carbon footprint.
Work out how much your family travels by different means of transport (e.g. daily bus commute or car commute to work).
Compare the results with your fellow group members. You can use the diagram to help you calculate:

Time	Activity	Method, working style	Tools	Notes



Means of transport	Passenger mile/kilometre	Carbon footprint
Pedestrian	*5*	*0*
Bicycle	*0*	*0*
Tram/train	*0*	*0*
Bus	*40*	*12 x 68= 2,720*
Motorbike	*0*	*0*
Car	*30*	*30 x 104= 3,120*
Airplane	*0*	*0*

After discussing the results, brainstorm ideas as to how you could reduce your carbon footprint, and by how much. *E.g. I cycle to school, I use public transport more often, we make sure that the car is full when we start a journey. We make sure that the car is full when we drive. If not everyone in the family has to travel, we share the car with neighbours and close friends. When the weather is good, I cycle to school instead of taking the bus, etc.*

b) Brainstorm ideas on the benefits of a smaller carbon footprint besides lower carbon dioxide emissions. For example, if I cycle to school, I get fitter.
When we drive with a full car, we always have time to talk. By taking the train or bus, we save the cost of using our own car, and if more people follow our example, morning traffic jams will be reduced. Besides the fact that cycling makes me fitter, I won't fall asleep in the first classes.

c) The price of transport

Topic, subject	Summarising the costs of using means of transport, the relationship between the environmental impact and the maintenance and operating costs.
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	25-30 minutes

Prior knowledge and definitions needed for the exercise	Car sharing
Aim of the exercise	Summary and comparison of the hidden and direct costs of means of transport. Identifying the advantages and disadvantages of different means of transport.
Competences that the exercise develops	Systems thinking Critical thinking Digital competences
Tools needed for the exercise	Smartphone/tablet, Wi-Fi access
Internet resources that students can use (for class-room and homework)	https://www.co2nnect.org/help_sheets/?op_id=602&opt_id=98&nmlpre-flang=hu
Recommended resources for teacher preparation	https://www.co2nnect.org/help_sheets/?op_id=602&opt_id=98&nmlpre-flang=hu https://www.levego.hu/kapcsolodo-anyagok/mitol-lesz-fenntarthato-a-varosi-kozlekedes/ https://www.consilium.europa.eu/hu/policies/clean-and-sustainable-mo-bility/
INSTRUCTIONS FOR THE EXERCISE	
Students work in small groups to calculate the costs of different transport modes, and then discuss the ad-vantages and disadvantages in groups. The groups should compare their results. The groups should decide which means of transport is both the most sustainable and convenient, and then they can compare their opinions with other groups. Students should look up the prices and fares for each mode of transport on the internet.	
MAIN STEPS TO SOLVE THE TASK	

Time	Activity	Method, working style	Tools	Notes
15-20 minutes	Calculating the cost of each transport mode.	Small-group work, discussion.	smartphone/tablet, Wi-Fi access	-
2 minutes	Forming groups	-	-	-
5 minutes	Gathering the pros and cons of transport modes.	Small group task	-	-
5 minutes	Choosing and discussing the most sustainable and comfortable means of transport with the other groups.	Small group task	-	-

Proposal for solving the task

a) Calculate how much it would cost to go shopping at the weekend by carsharing, taxi, carpooling, and with your own vehicle. Gather information on the direct costs (fuel, tolls, fares, rental fees) and indirect costs (e.g. service cost, insurance, etc.) of each means of transport.
(In the case of your own vehicle, base the calculation on 15,000 km per year and HUF 5 million for the purchase price of the car, with 10 years of use.) Calculate your results for 1 km, and record them in the table below.
Time to destination: 30 minutes (or 10 km)
Time there: 60 minutes
Time to return home: 30 minutes (or 10 km)

	Car sharing	Taxi	Car pooling	Own vehicle	Public transport
fuel cost/km				26.95 HUF/km	
toll/km				1 county motorway sticker 0.33 HUF/km	
total indirect cost/km				servicing and insurance: 7 HUF/km, depreciation: 33.33 HUF/km	
total cost	2 x 30 minutes x 80 HUF = 4,800 HUF + 60 x 20 HUF waiting fee, total = 6,000 HUF	2 x 10 km x 300 HUF + 700 HUF basic fee, total = 3,700 HUF	70 HUF/km x 2 x 10 km = 1400 HUF	HUF 1,019	250 HUF/10 km, 2 x 250 HUF = 500 HUF

b) Split into groups of five and discuss the advantages and disadvantages of each means of transport.
For example, public transport is the cheapest, but I have to adapt to the timetable and carry my shopping from the bus stop to my flat. Buying my own vehicle is a big expense, and I have to pay all the car-related costs, but in return, I can go whenever I want and it takes me door to door. Car sharing is only available in Budapest, not in my town. Taking a taxi is comfortable and adapts well to my occasional trips; the relatively high price is acceptable.
Carpooling for such a short distance is difficult, unless my neighbour is just about to set off.

c) Discuss which solution is the most sustainable, and most comfortable for you, and realistically the most feasible. Share your chosen solution with your classmates.
For me, the taxi is the most affordable and sufficient, but putting up with a little more inconvenience, public transport is the most sustainable and one of the cheapest options too.

d) Who has seen more of Europe? You or your hamburger?

Topic, subject	Food mile/kilometre
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	26 minutes
Prior knowledge and definitions needed for the exercise	Food mile/kilometre, carbon footprint
Aim of the exercise	The aim of the exercise is to make students aware of the environmental impact of bringing food to the table. They should understand that we are responsible for reducing this environmental impact and can do much about it.
Competences that the exercise develops	Strategic competence Creativity and cultural awareness competences Systems thinking
Tools needed for the exercise	Calculator, internet access
Internet resources that students can use (for classroom and homework)	https://gasztrohos.blog.hu/tags/%C3%A9lelmiszer-kilom%C3%A9ter
Recommended resources for teacher preparation	https://gasztrohos.blog.hu/tags/%C3%A9lelmiszer-kilom%C3%A9ter
INSTRUCTIONS FOR THE EXERCISE	
Using a map, individually or in small groups, students should calculate the food mile of a hamburger and the CO_2 emissions associated with it. How can these emissions be reduced, and what can students do to reduce them?	
MAIN STEPS TO SOLVE THE TASK	

Time	Activity	Method, working style	Tools	Notes
6 minutes	Calculating the food mile/kilometre of a hamburger.	Working individually or in groups	calculator	-
10 minutes	Calculating the CO_2 emissions associated with the transport of a hamburger.	Working individually or in groups, interpreting the result	calculator	-
10 minutes	Brainstorming the supply of ingredients for your own restaurant.	Working individually or in groups	-	-

Proposal for solving the task

a) Use the map to calculate the total distance travelled by the ingredients of a hamburger meal in Hungary.
Beef and cheese 900 km + roll 350 km + cucumber 1,500 km + potato 800 km + coke 1,700 km + onion 400 km + salad 2,800 km + paper cup 700 km = 9,150 km

b) If an average truck travelling at an average speed of 80 km/h consumes 25 litres of diesel per 100 km, how many litres of diesel are consumed during the journey of all the ingredients?
(9,150 / 100) 25 = 2,287.5 l diesel

c) Burning 1 litre of diesel produces approximately 2,600 g of carbon dioxide. In total, how many grams of carbon dioxide are released into the air during the transportation of all the ingredients?
2,287.5 l x 2,600 g = 5,947,500 g CO_2
We can make our calculation more precise if we consider that a hamburger weighs 300 g and a truck carries 7.5 t of goods. Thus the total CO_2 emissions are (0.3 kg / 7,500 kg) x 5,947,500 g = 237.9 g CO_2
We can make the result even more exact by calculating the fuel consumption and CO_2 emissions of the truck relative to the weight of the ingredients needed to make a burger.

d) Check the textbook for the potential consequences of emissions of this magnitude.
Data found: *Road transport generates significant noise and dust in addition to CO_2 emissions, and diesel cars are responsible for the majority of nitrogen oxide emissions, which are more powerful greenhouse gases than CO_2.*

e) Brainstorm ideas on how far you could get the ingredients for a burger from if you were to open a fast food restaurant in your own town.
I buy fresh rolls from the local bakery. I buy vegetables from farmers in my area, mainly in the vegetable season, but we can also get fresh vegetables in winter from the cold store 20 km away. The cheese from the family dairy 15 km away goes well with the meat from the cattle farm 80 km away. We would also make meat-free and vegan burgers.

e) This is what our smart city will look like!

Project task name	This is what our smart city will look like!
Source	-
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	45 minutes (including preparation)
Prior knowledge and definitions needed for the exercise	Urbanisation, comparison of environmental impacts of transport modes
Aim of the exercise	Identifying the transport problems of towns and cities and developing ideas for a sustainable transport system.
Competences that the exercise develops	Systems thinking Critical thinking Communication competences Cooperation Competences for creativity, creative work, self-expression and cultural awareness Digital competences
Tools needed for the exercise	large paper, pencils, felt-tip pens, computer with internet access and presentation software (optional) for making presentations
Where	Classroom
Preparing the task	Provide a number of large sheets of paper, pencils and felt-tip pens for the number of groups, possibly a computer with internet access and software for the presentation
Internet resources that students can use (for classroom and homework)	http://okosvaros.lechnerkozpont.hu/hu

Recommended resources for teacher preparation	http://okosvaros.lechnerkozpont.hu/hu

INSTRUCTIONS FOR THE EXERCISE

Working in groups, students should create a smart city transport system of their own, devised in line with sustainability. They should make a presentation of their ideas, present them to each other and comment on them.

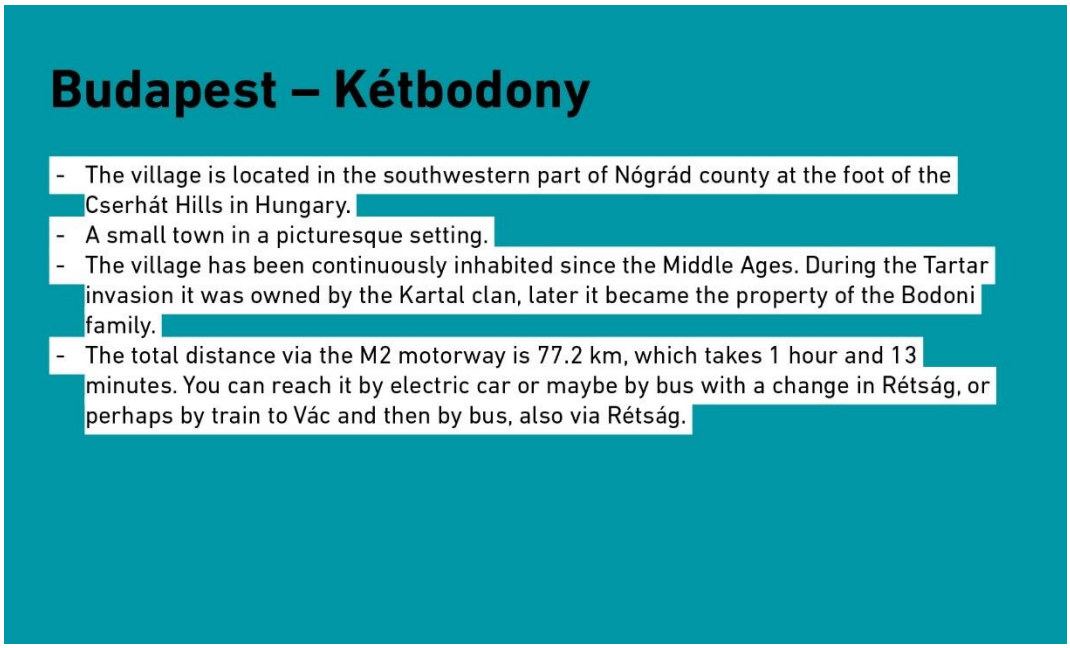
MAIN STEPS TO SOLVE THE TASK

Time frame	Activity	Instructions	Method, working style	Tools	Notes
2 minutes	Forming groups	Split into groups of 4-5 students. Those with a card showing the same means of transport are grouped together.	Small-group task	To form the groups, use a picture or drawing of an alternative means of transport, e.g. a maglev train, a self-driving metro, an electric/fuel cell car, etc. in as many versions as the number of groups, and as many copies as the number of the members of the group.	
20 minutes	Designing a smart city	Gather ideas for a sustainable transport system between your home and the surrounding settlements.	Brainstorm ideas, in small groups	large sheet of paper, felt-tip pens, pencils	-
23 minutes	Presentation of the plans	A brief presentation of the plans resulting from the brainstorming.	A short presentation or poster by a member of the group	large sheets of paper, pencils, felt-tip pens, possibly a computer with internet access, presentation software	
EVALUATION		Evaluation of the plans (teacher, classmates) based on environmental considerations and feasibility.			

IV. Other ideas for working with the textbook

a) For the textbook article *Animals at risk*, you can create a comic illustration with the art class, like the art students of the Madách Imre Secondary School in Vác (MoE: 032557) did in their project.
The task was to create a comic book that shows the dangers animals face on their journeys, and the human solutions to counter them. The first step of the project task is to gather information on the hazards of the human-built environment during animal journeys and migrations, and how artificial solutions of the built environment help animals to migrate.

b) The *Become an ecotourist yourself!* workbook exercise has already been tested during the online education, and the session included a live video lesson with work in groups of 3-5 people, resulting in an ecotourism offer. If you work with a language class, or a class where the students have sufficient knowledge of foreign languages, you can also prepare the tourism offer with your students in a foreign language.



Accommodation, products, services

The Bakancstanya accommodation is located in Kétbodony, 70 km from Budapest, where the Cserhát and Börzsöny Hills meet. The village is known for its beautiful lake and flowery streets.

3500 HUF/person/night for 2 adults and 2 children, Total cost: HUF 54,000

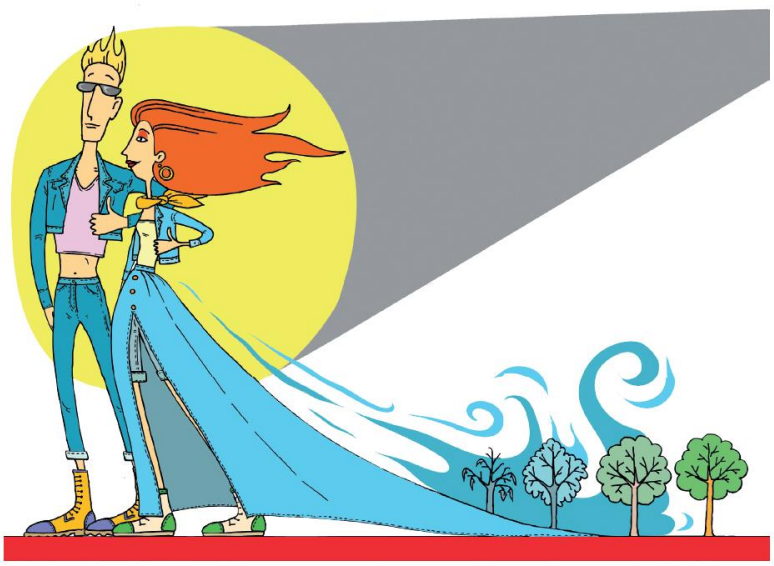
Events

For those who dare to venture into larger crowds:

- Plum Saturday: On Plum Saturday you can eat plum dumplings and goulash soup. There is normally a slightly bigger crowd because there are usually fun concerts and other performances.
- For those who don't want to visit here:
- Hiking in the Cserhát hills, with the Prónay lookout as a possible final destination with a spectacular view; even the Danube bank can be seen in nice weather.

LOOKING GOOD!

Fashion and the environment



A guide to working with the Looking good! magazine

Purpose of this issue	Objectives of the framework curriculum: - Recognising the messages of consumer society and their consequences. - Distinguishing needs from wants. - The need and possible consequences of changing consumption patterns: reducing the negative impact of consumer behaviour on the environment. - Corporate social responsibility. - Identifying and learning from national and international good examples and practices.
Time frame	6 lessons
Links within the textbook and between subjects	This topic forges close links with the chapters on *Naturally is best!* and *Building a vision*. Connections with other subjects in grades 9-10: a) Chemistry - A debate with arguments for and against single-use plastic cups, plates and cutlery, and those made from paper and

	wood: "Why does/can cellulose replace plastic party supplies in many places?" A debate with arguments on the advantages and disadvantages of using plastics. - Brainstorming ideas on how to reduce the amount of plastic products we use in our everyday lives. - Collecting information on degradable plastics. - Create a project or video on "How to achieve a waste-free life". b) Biology - Analysing and articulating individual, community, national and global responsibilities and opportunities for action related to sustainability. c) Geography - Developing evaluative thinking based on an analysis of the causes of different levels of socio-economic development in different regions of the world. - Developing the ability to form opinions and think evaluatively by systematically analysing the socio-economic and environmental consequences of globalisation and its impact on our everyday lives. - Developing problem-solving thinking by understanding and interpreting financial decisions in everyday life. - Developing consumer awareness by presenting the characteristics of consumer society and a conscious consumer community. d) Visual culture - Based on personal examples, analysing the factors influencing current fashion and the short-term changes thereof (e.g. material environment, consumer habits, socio-economic-cultural background) in creative tasks (e.g. creating a style sheet, character creation according to given criteria, designing a fictitious brand for a given purpose) to strengthen their own identity.
Focus on skills development	The students: - can separate their needs from their wants; - can identify waste-reducing behaviours; - know the labels indicating responsibly produced products and their content; - demonstrate, using examples, that nature does not produce waste: compare decomposition processes in nature with the potential for recycling waste; - can make personal commitments to protecting the environment after careful consideration of their own limits and possibilities; - can demonstrate the concept of life cycle and the idea of a circular economy through the life-cycle analysis of a selected object.

I. Methodological recommendations for working with the topic

The articles in the magazine and the exercises in the workbook are designed to help students learn about consumption and fashion through their everyday experiences. It is therefore worth building each lesson on a personal experience from their own life, and going through the relevant textbook content and workbook exercises. This way you should try to raise students' awareness of the links between their habits dictated by consumer society, and the resulting environmental impacts.

The pedagogical methods used in the lessons should be suitable for developing students' critical thinking, comparing facts and opinions, and practising methods of reasoning and discussion. For teenagers, fashion is often an important aspect of self-determination, so teachers need to pay particular attention to the conflicts that can arise between students, and the tensions and anxiety that can develop in some students. We therefore recommend using practical and experiential methods to work on the topics, as well doing research and presenting the results to deepen the understanding of each topic.

The topics of consumption and fashion can also be addressed as extra-curricular activities, for example in an afternoon session.

II. Suggested literature and resources for teacher preparation and working with material

For the ***independent*** research of students on the environmental impacts of consumption habits and the concept of overconsumption, we recommend the following page: https://ng.24.hu/tag/tulfogyasztas/ (***downloaded on 1 February 2021)***

A Spanish documentary (*The Light Bulb Conspiracy!)* on planned obsolescence, made in 2010 to raise awareness of a phenomenon in consumer society (https://www.youtube.com/watch?v=C_2TFgAinAg***; downloaded on 1 February 2021)***

Bea Johnson's book *Zero Waste at Home,* also available in Hungarian, offers practical advice on living a zero-waste lifestyle (http://www.tericum.hu/?product=2539***; downloaded on 1 February 2021)***

Environmental researcher Edina Kump's 30-day packaging-free challenge helps to put the zero-waste lifestyle into practice (https://hulladekmentes.hu***; downloaded on 1 February 2021)***

Publication giving ideas on recycling waste: Doró, V. (ed.) (2016). *A hulladék új élete – Ökodizájn Magyarországon, ReCity* [The New Life of Waste – Ecodesign in Hungary, ReCity]. (https://recity.hu/letoltheto-okodizajn-konyv/***; downloaded on 1 February 2021)***

The article entitled *12 points of the conscious consumer* gives you simple, easy-to-use ideas for conscious consumption (https://tudatosvasarlo.hu/regi12pont/***; downloaded on 1 February 2021)***

References:

Big fashion brands are also moving to a circular business model (https://piacesprofit.hu/klimablog/a-nagy-divatmarkak-is-atallnak-a-korforgasos-uzleti-modellre/; ***downloaded on 1 February 2021)***

The origin of cotton and flax. The history of cotton (https://tudasbazis.su-linet.hu/hu/szakkepzes/konnyuipar/ruha-es-textilipari-szakmai-ismeret/a-pamut-es-len-elofordu-lasa/a-gyapot; ***downloaded on 1 February 2021)***

Bagyinka, F., Gyebnár D., Nádasy B., Pataki F., Perger J., Radovics K., Szabó I. (undated). Ha a kör bezárul – a körforgásos gazdaság jelentősége és lehetőségei. [When the circle closes – the importance and opportunities of the circular economy]. (https://www.pwc.com/hu/hu/kiadvanyok/assets/pdf/kor-forgasos.pdf; ***downloaded on 1 February 2021)***

Fogarassy, Cs. (2012). *Karbongazdaság*. [Carbon economy]. L'Harmattan Kiadó. Budapest

How you're killing the planet with your compulsive clothes shopping (https://greenfo.hu/hir/igy-gyilkolod-a-bolygot-kenyszeres-ruhavasarlasoddal/; ***downloaded on 1 February 2021)***

Circular economy in practice: the Finnish example (https://europapont.blog.hu/2019/11/17/korfor-gasos_gazdasag_a_gyakorlatban_a_finn_pelda; ***downloaded on 1 February 2021)***

Circular economy in practice: the Swedish example (https://europapont.blog.hu/2019/12/05/korfor-gasos_gazdasag_sved_pelda; ***downloaded on 1 February 2021)***

Circular economy: what is it, why is it important, and what are the benefits? (https://www.euro-parl.europa.eu/news/hu/headlines/economy/20151201STO05603/korkoros-gazdasag-mit-jelent-miert-fontos-es-mi-a-haszna; ***downloaded on 1 February 2021)***

Toxic jeans (https://tudatosvasarlo.hu/mergezo-farmerek/; ***downloaded on 1 February 2021)***

Our everyday rubbish and e-waste (http://sustainableproject.net/wp-content/up-loads/2016/05/1fejezet_Mindennapi_szemetunk_PL.pdf; ***downloaded on 1 February 2021)***

Nomophobia Questionnaire (https://www.psytoolkit.org/survey-library/nmp-q.html; ***downloaded on 1 February 2021)***

Passzold vissza, Tesó! [The Forest is Calling!]. Co-funded by the European Union, it will continue in 2021 (https://www.janegoodall.hu/mobilkampany.html; ***letöltés ideje: downloaded on 1 February 2021)***

Clothes label guide: What to look out for to make sure your favourite sweater doesn't end up in the bin (https://www.onlinemarkaboltok.hu/blog/ruhacimke-kisokos; ***downloaded on 1 February 2021)***

Soil degradation processes (https://regi.tankonyvtar.hu/hu/tarta-lom/tamop425/0032_kornyezetvedelem/ch20s04.html; ***downloaded on 1 February 2021)***

U.S. Smartphone Use in 2015 (https://www.pewinternet.org/2015/04/01/us-smartphone-use-in-2015/; ***downloaded on 1 February 2021)***

III. RECOMMENDATIONS FOR LESSON PLANS

Lesson 1

Topic of the lesson: Consumer habits

Time required: 1 lesson

Pedagogical objective: The aim of the activity is for the students to:

- learn about overconsumption,
- identify the environmental impacts of consumption patterns through research,
- recognise their individual responsibility in their consumption habits.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Introduction of the concept of over-consumption	Recommended text of the text-book: *Are we consuming the earth?* A discussion on the topic based on the text to engage the students. Additional tasks: - Check out which days have been marked in recent years as the Earth Overshoot Day in Hungary, countries of the Carpathian Basin and throughout the world. - Make a graph of what you find. Discuss with your class-mates what these figures mean.	frontal	textbook
25 minutes	Recognising the en-vironmental im-pacts of consumer habits	Let the students form their own groups a) The students should look into the civilisation processes that bring the date of Earth Overshoot Day closer and closer each year.	small group research and problem solving	textbook, work-book, lap-top/computer, smartphone

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		Students can use the internet to search for information. Recommended website: https://ng.24.hu/tag/tul-fogyasztas/ b) They should find examples from their own life about what they can do to not waste the Earth's energy reserves. c) 2020 was an exceptional year due to the coronavirus pandemic. How did this affect Earth Overshoot Day? https://computerworld.hu/velemeny/iden-kesik-a-tul-fogyasztas-napja-akkor-fellelegezhetunk-280302.html; https://ng.24.hu/fold/2020/08/22/merseklodott-a-tulfogyasztas-2020-ban/ d) Then the students should work in groups to solve the *Fight against overconsumption* workbook exercise.		
10 minutes	Sharing and discussing experiences, impressions and individual thoughts	Discussing the workbook exercise.	frontal	textbook, workbook
SEN recommendations Reading and interpreting the article *Are we consuming the Earth?* independently and the content on the recommended website can be a problem for dyslexic pupils. It is recommended to read and discuss the article in pairs, or assign it as homework in the previous lesson. A classmate or a teacher can also help them to search online. For students with learning or attention difficulties, memory problems or hearing impairments, it is recommended to continue the digital glossary they started in previous lessons, including concepts such as Earth				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
Overshoot Day and energy reserves. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter and simpler explanations that do not contain foreign terms. Students with dyscalculia may find it difficult to make a graph of Earth Overshoot Day. Work in pairs is recommended. The writing and spelling of a student with dysgraphia, dyslexia or dysorthography should not be assessed when solving the exercise in the workbook.				

Lessons 2-3

Topic of the lesson: Impacts of consumption

Time required: 2 lessons – it is recommended to combine the lessons

Pedagogical objective: The aim of the activity is for students to learn about the story of everyday objects (e.g. mobile phone, T-shirt, jeans), the details of how they are produced, used and treated as waste, the environmental impacts of each process, the life cycle of objects and the concept of circular product management.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Raising awareness of the environmental impacts of consumption	Study the text *How much does a gorilla pay for a mobile phone?* in the textbook. Write an outline highlighting the main points, individual work	teacher's presentation - during the teacher's presentation, a close-up photo of a gorilla or its habitat and the inside of a mobile phone can be projected	laptop/computer, projector Read and process the textbook text,
50 minutes	Learning about the water-squandering effects of bad habits and innovative ways to recycle	Set up groups using cards, e.g. with product names and their ingredients Life cycle analysis of a selected object (e.g. phone, T-shirt, jeans), the concepts of life cycle and circular economy. Based on the information provided, students should create an infographic or a flowchart of the	solving the workbook exercise in small groups Watching the short films and preparing a brief summary of what was seen.	textbook, laptop/computer, projector, drawing paper, writing utensils

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		life cycle of the selected object based on *The story of our objects – life-cycle analysis* workbook exercise, parts a) to c). Suggested textbook texts: - Water footprint of a white T-shirt - Buy fair trade products! - Green jeans - Open your eyes! - Green mosaic: did you know? - DOES A FAIR PHONE EXIST? Short films related to the topic: - Bags made from recycled plastic bottles: https://www.youtube.com/watch?v=quvknS61j-w&t=2s - Making clothes from recycled plastic: https://www.youtube.com/watch?v=Wu95zWnW8Dg - An explanation of circular product management: https://kamaraonline.hu/korforgasos-gazdasag-minden-amit-az-uj-brusszeli-csomagrol-tudni-kell/ - Highlight the main ideas of the text, create an infographic or a flowchart on circular product management.	Discussing the circular product management text.	
30 minutes	Presentation and discussion of the completed work	Small-group presentation of the summary and the infographic or flowchart. Additional task (workbook exercises for homework): - *The story of our objects – life-cycle analysis* exercise, point (d) - Wardrobe - Hunting clothing labels…	small group presentation	laptop/computer, projector, workbook
SEN recommendations				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
Reading and interpreting textbook texts related to the lesson material independently can be a problem for dyslexic pupils. It is recommended to read and discuss the article in pairs, or assign it as homework in the previous lesson. As this issue and this lesson requires a lot of independent reading and interpretation of texts, which is difficult for students with reading disabilities, it is recommended to offer them videos with similar content, such as short films on the topic. When selecting the members of the groups, it is advisable to take into account the individual characteristics of the students with special educational needs, and offer them appropriate tasks within the group: for example, hyperactive pupils can do research on the internet or prepare a draft for an infographic, while dyslexic students can design an infographic. The rules for group work and the activities, responsibilities and rights associated with the tasks assigned in the group should be clear and transparent for students with behavioural problems or autism spectrum disorder. If you can, give them a choice that suits the teaching material and the tasks.				

Lesson 4

Topic of the lesson: Conscious shopping

Time required: 1 lesson

Pedagogical objective: The aim of the activity is for the students to:

- recognise the manipulative effects of advertising on people's shopping habits,
- learn about conscious shopping habits and recognise the characteristics and environmental impacts of their own shopping habits;
- understand the concept of "impulse buying" and the purpose of the "Buy Nothing Day" initiative.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	The impact of advertising	Recognise advertising tricks and learn about the concept of conscious shopping. Present advertisements or ad spots of their choice.	discussion, frontal	Read through the textbook article *Open your eyes!*
10 minutes	Introducing conscious shopping	Learn about conscious shopping habits. Split into 6 groups. Each group is given 1 sheet of paper with one of the points of the conscious customer on it. The groups act out the text they find on the sheet of	playing a game together	Textbook text: *How can you be a conscious customer?* Six points from the textbook

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		paper to the others, like in the game of *Charades*. The others have to guess what the text might be about.		printed on 6 different sheets of paper.
20 minutes	Exercise in self-knowledge	Studying the textbook text *What type of customer are you?* and solving the related *Take a look in the mirror!* workbook exercise, point a). Based on the test in the textbook, the students should determine what kind of customer you are. - emotional customer - impulsive customer, - brand-loyal customer, - conscious customer. Describe the characteristics of the class. Discuss what needs to change to promote sustainability. Make individual commitments.	working individually, sharing and discussing experiences	workbook
10 minutes	Exercise in self-knowledge	Additional tasks (workbook exercises also for homework): - Advertising pattern - Draw inspiration from your own life! - *Take a look in the mirror!*, points b) and c)	working individually	workbook
SEN recommendations Instead of reading the article *Open your eyes!*, it is recommended to watch and analyse some advertisements with the students with special educational needs, according to the aspects presented in the textbook: short supply, recommended by celebs, tempting your senses, deceptive discounts.				

Lessons 5–6

Topic of the lesson: Zero-waste solutions

Time required: 2 lessons

Pedagogical objective: The aim of the activity is for the students to:

- learn about the history of consumer society and its impact on our daily lives, and
- be aware of simple ideas that can be implemented in everyday life to reduce these negative impacts.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
20 minutes	Raising awareness of a phenomenon in consumer society	Watch part of *The Light Bulb Conspiracy!* film, as chosen by the teacher: https://www.bing.com/videos/search?q=tervezett+elavul%c3%a1s&&view=detail&mid=C5D3A9E01C1049214A92C5D3A9E01C1049214A92&&FORM=VRDGAR		Preparation: choosing an appropriate part from the film, laptop/computer, projector
25 minutes	Debating the pros and cons	A summary discussion of what was seen in the film, along the following lines: - What is planned obsolescence based on? - What triggered the planned obsolescence mechanism? - What is the product life cycle being adapted to? - What has been the result of planned obsolescence? - What is the environmental impact of this process?	conversation, face-to-face confrontation	–
30 minutes	Creative tasks to work on the topic	Tasks that can be chosen by small groups: - recycling jeans; - making jewellery from textile waste;	small-group work	Preparing the work, providing the right materials (e.g. denim, textile, glue, scissors, thread,

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		- creating a new product from a selected type of waste.		needles, paper, plastic cups, etc.)
15 minutes	Presentation of the finished objects	Presentation and peer evaluation of the finished objects. Awards for the best. It is also worth organising a school exhibition of the objects. Additional task (workbook exercises for homework): the *Zero-waste solutions* exercise. A useful website for solving the task: https://hulladekmentes.hu	large-group exhibition	the finished objects, possible prizes
SEN recommendations When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to set rules for debating pros and cons to avoid conflicts. Examples: Do not judge each other. Every thought counts. You can disagree with each other in a civilised manner, etc. If the task chosen by the small group does not match the ability of the student with special educational needs, they should have the possibility to change groups or choose from the workbook tasks below.				

IV. Recommendations and suggestions for the exercises in the textbook and workbook

a) Take a look in the mirror!

Topic, subject	Identifying students' own consumption and shopping habits
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	30 minutes
Prior knowledge and definitions needed for the exercise	Prior knowledge needed: - conscious shopping, - impulse buying, - Buy Nothing Day

Aim of the exercise	The aim of the exercise is to make students understand their own shopping habits.
Competences that the exercise develops	Recognising and understanding interrelationships, developing self-awareness
Tools needed for the exercise	workbook
Internet resources for students	-
Recommended resources for teacher preparation	-

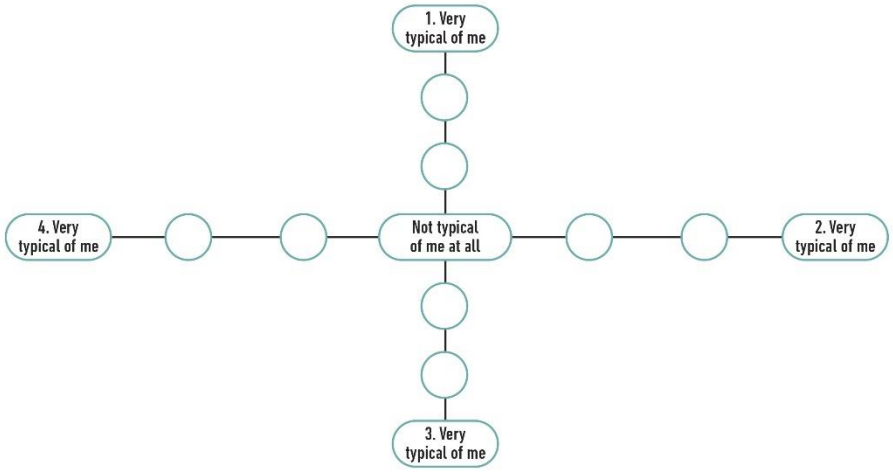
INSTRUCTIONS FOR THE EXERCISE

Inform the students that they can use the tests in the textbook to make a description of themselves and identify their shopping habits. It is important to point out that this is not a test to reveal personality traits, but rather a fun and playful way to raise awareness about conscious consumer behaviour.

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Method, working style	Tools	Notes
30 minutes	Students should make a description of themselves based on the tests in the textbook.	complete the table individually (marking their own characteristics on each axis)	workbook	If the students agree, it is worth discussing the information received and identifying the characteristics of the class as a whole.

Diagram accompanying the textbook text WHAT TYPE OF CUSTOMER ARE YOU?:

Time	Activity	Method, working style	Tools	Notes
				

b) Draw inspiration from your own life!

Topic, subject	Consumption and shopping habits
Position of exercise in teaching process	The exercise primarily helps with practising.
Time required for exercise (minutes, hours, days)	Homework: 15 minutes
Prior knowledge and definitions needed for the exercise	-
Aim of the exercise	Students should recognise the extent to which they are environmentally conscious consumers.
Competences that the exercise develops	Recognising and understanding interrelation-ships, self-awareness, logical thinking.
Tools needed for the exercise	workbook
Internet resources for students	-
Recommended resources for teacher preparation	-
INSTRUCTIONS FOR THE EXERCISE	
a) Students can read about a few purchase and consumption habits in the table. Everyone should think whether there is a more sustainable solution than these. The students should colour the cell of the middle column wherever they feel there is nothing else or more they could do.	

b) The students should put the habits in order according to which alternative solution is the easiest and which is the hardest to implement.

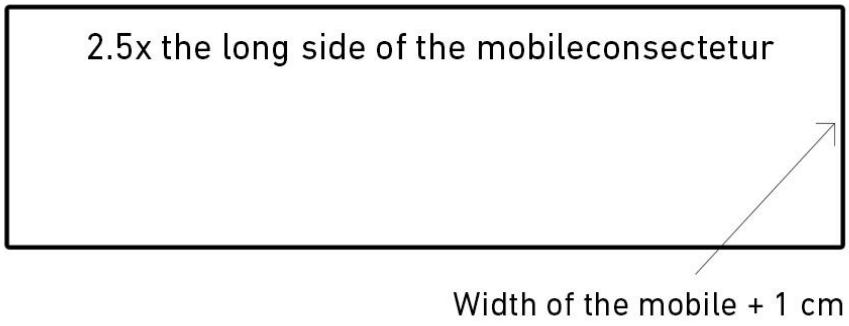
POSSIBLE SOLUTIONS TO THE PROBLEM	
Activity, habit	More sustainable activity, habit
Separate collection of jam jars	Recycling jars (e.g. for storage).
Frequent consumption of sugary drinks	Tap water consumption.
Purchasing a new T-shirt from a famous chain	Refurbishing old T-shirts, shopping in a second-hand shop, buying domestic products.
Bringing a canvas bag for shopping	Preparing food storage containers (e.g. jars) for shopping, going to packaging-free shops, buying vegetables/fruit at the market (no packaging needed).
Using public transport	Cycling or walking.
Separate collection of used one-sided printing paper	Minimising amount of printing, printing on both sides of the paper, ink-saving solutions.
Ordering gadgets online	Using only what is really essential, not using unnecessary gadgets.
Buying pastries in separate plastic bags	Taking designated canvas bags for shopping.
Buying water in plastic bottles	Drinking tap water, storing water in glass bottles, using and carrying your own water bottle with you.
Wearing fast fashion clothes	Taking care of your clothes so you don't have to buy so many. For example, following advice on clothing care (see clothing labels), buying durable and good quality clothes.
Shopping in hypermarkets	Shopping in local shops.

IV. Other ideas for working with the textbook

Recycling jeans – What can be made from the jeans you no longer wear?

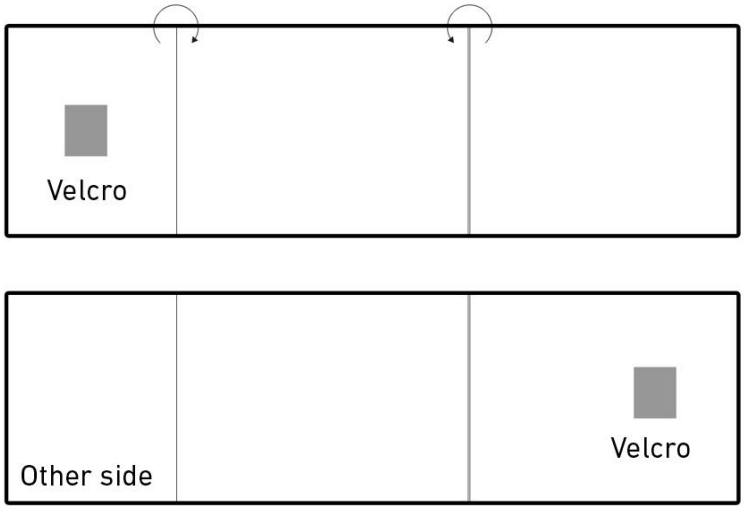
1. With a little training, you can sew yourself a glasses or mobile phone holder, a pen holder or a pencil case. The easiest is probably a mobile phone case, as you can sew it by hand without a sewing machine.

a) In preparation, first measure the width and length of your phone; the thickness of current devices makes no difference. You will need two rectangular pieces of fabric. Their length should be two and a half times the length of your phone, and the width should be the width of your phone + 1 cm (add half a cm on each side for the seam).
Other materials needed: 5-cm-long self-adhesive Velcro.



b) Sew the two long pieces of fabric together with the back of the fabric facing outwards, leaving a small gap so that you can turn it inside out, then carefully sew this section together as well. Iron it so you can work more easily.

c) Fold in a length matching your telephone and mark where the Velcro will go. Glue it to the fabric, then stitch both halves in the appropriate place to strengthen them. Before sewing, check they are in the right place.



d) Sew the double fabric together on both sides, close to the edge, using even stitches. The folds will be positioned according to the size of the phone. You've now done most of the work, and you can decorate as you like.
e) Have fun making it! You could even organise an exhibition of the finished pieces.

2. More experienced students can also sew a beanbag from the leftover material.

For a step-by-step sewing guide to making a beanbag, see the following page:
https://www.almaimotthona.hu/hazilag-babzsak-fotel-keszites.html

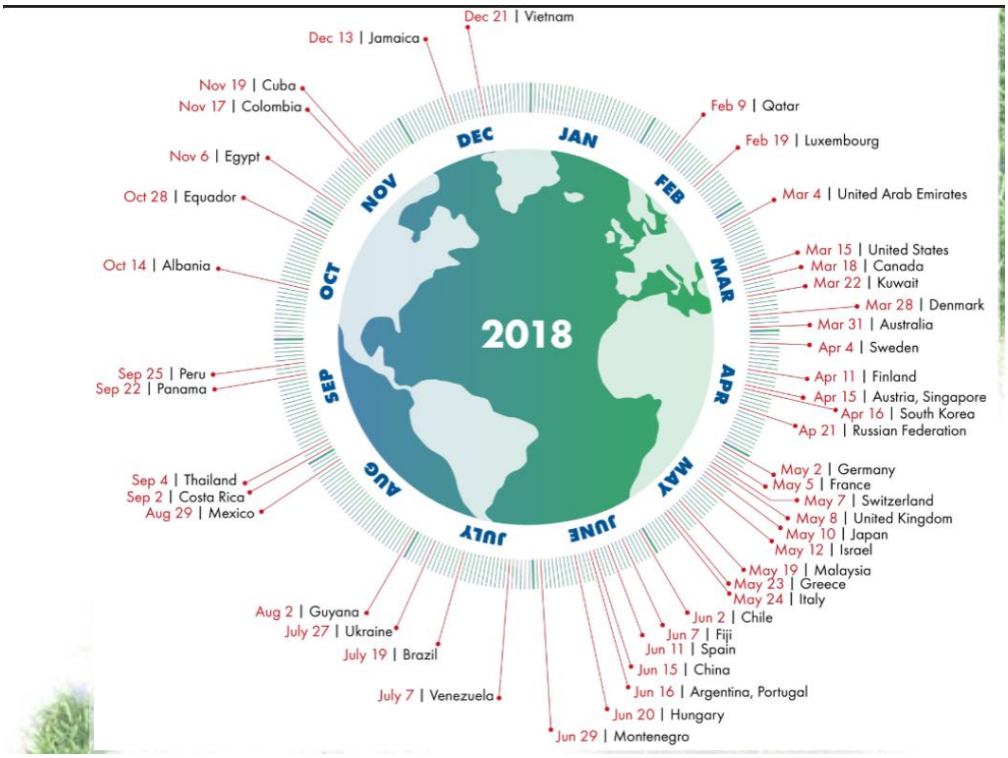
IV. Solutions to some workbook exercises

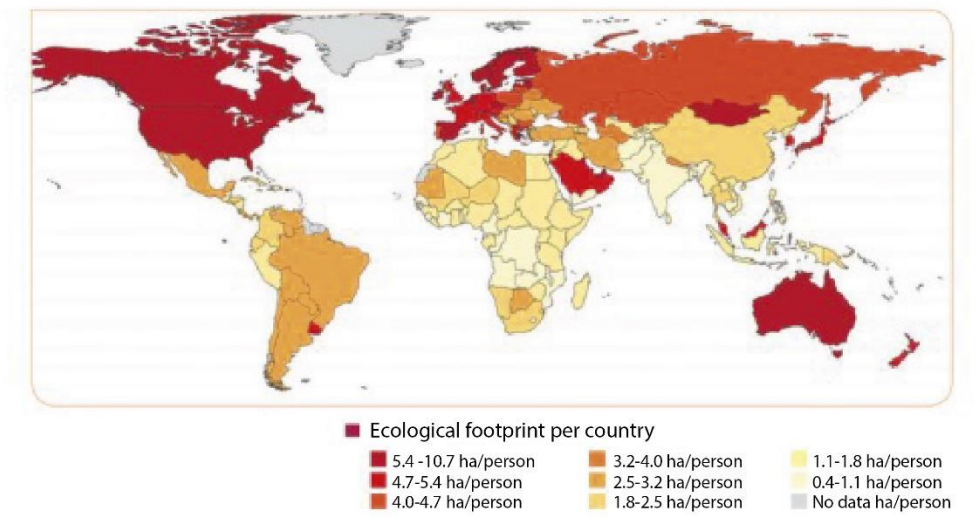
8. Charity shops

Environmental benefits	Social benefits
- extending the life of products that have become waste - waste diversion from landfills - reuse - possibility of repair - raising awareness	- items reach people in need - second-hand goods for sale at low prices - providing job opportunities for people with disabilities and from disadvantaged backgrounds - "it's good to do good" – the positive feeling of giving

9. Global ecological footprint – research work

Diagrams to help you find a solution:





https://www.nkp.hu/tankonyv/fizika_10/lecke_03_009

Examples for reducing the ecological footprint:

- using renewable energy sources for energy production,
- buying fewer consumer goods,
- preference for local products,
- using public transport instead of cars,
- reducing the production of luxury goods,
- minimise the use of packaging materials,
- manufacturing consumer goods that are durable and can easily be repaired.

10. Zero-waste solutions

Environmentally harmful products	Eco-friendly alternative
Paper napkin 	Washable (disinfectable) textile napkins 
Plastic cup	Washable glass or porcelain cup

	
Plastic (polystyrene) food delivery box 	Durable, washable (e.g. glass, metal, durable plastic, bamboo), sealable food storage container 
Plastic cutlery 	Cutlery made of metal (possibly wood) 
Plastic straws 	Straws produced from straw (the most environmentally friendly solution is to leave them out) 
Plastic bag 	Washable canvas bag 

I FEEL AT HOME IN MY HOME

Apartment, building, municipality

A guide to working with the I feel at home in my home magazine

Purpose of this issue	Objectives of the framework curriculum: - Adopting an energy-efficient approach and a lifestyle based on it. - Learning about the ways to save energy in households and communities. - Learning about renewable energy sources and how to use them. - Understanding the possibilities and the system of environmental problem management. - Recognising the need for the correct use and ongoing maintenance of machinery. - Understanding landscape architecture and the use of natural local materials.
Time frame	6 lessons
Links within the textbook and between subjects	This topic forges close links with the chapters *Naturally is best!* and *On the Road?* Connections with other subjects in grades 9-10: e) Biology - Emissions of pollutants and their impact on the environment such as global warming or climate change. f) Chemistry

	- Renewable and non-renewable energy sources, the environmental impact of different elements and chemicals. g) Geography - Use of maps, the functioning of geo-information systems (GPS), climatic features, climate change, the economic role of energy sources, conscious consumer behaviour. h) Digital culture - Using presentation software, searching for information on the internet.
Focus on skills development	The students: - can distinguish and define the concepts of energy saving and energy efficiency; - can demonstrate the link between insulation and energy consumption; - can compare the energy and water requirements of different products and services; - can map the school and its surrounding area (immediate living environment, own room, flat) from an environmental and health point of view and make suggestions; - can identify which competent organisation to contact for different environmental problems (local MP, local authority, national park management or find a solution themselves); - can design a community space (e.g. community park, house, schoolyard, municipal nature trail) with classmates, taking sustainable aspects into account, and develop the functions of the community space together.

I. METHODOLOGICAL RECOMMENDATIONS FOR WORKING WITH THE TOPIC

The built environment is where we spend most of our time, so the impact of the built environment on nature and wildlife is of particular importance. Humans are part of the living world, so they are affected by the built environment just as much as any other living thing.
The exercises in the workbook help you to work through the magazine issue.
The problem solving focuses on the students expressing their opinions and ideas, and sharing them with their classmates. The project tasks centre around the development of creativity, self-expression, self-awareness and the application of knowledge, rather than being knowledgeable about a subject.

In the teaching and learning process the students should be the leaders. Through their own experiences and insights, they shape their own approach inductively and deepen their understanding of necessary concepts and the application of knowledge. Through the tasks, encourage your students to take action, and support them to inspire others to take action too.
It is important to highlight the role of the individual, and to understand its importance in the fight against environmental problems.

II. Suggested literature and resources for teacher preparation and working with material

Circular economy:

- https://www.europarl.europa.eu/news/hu/headlines/economy/20151201STO05603/korkoros-gazdasag-mit-jelent-miert-fontos-es-mi-a-haszna
- https://raketa.hu/korkoros-gazdasagi-modell
- http://korkorosgazdasag.hu/elgondolkodtato/falvak-ahol-nem-kell-rezsit-fizetni/

Urbanisation:

- https://regi.tankonyvtar.hu/hu/tartalom/tamop425/2011_0001_520_europa_tarsadalomtortenete/ch10s04.html
- https://tudasbazis.sulinet.hu/hu/termeszettudomanyok/foldrajz/tarsadalomfoldrajz/telepulesfoldrajz/urbanizalodo-vilagunk

Passive houses:

- https://passiv.de/
- https://kp.hu/hoszukseglet-a-normal-az-energiatakarekos-es-a-passziv-hazak-tekinteteben/
- http://www.kenderhaz.hu/2014/04/modern-szigeteloanyagok/
- https://nuus.hu/tech/tudomany/0707/allatok-gyartjak-vilag-legjobb-legkondicionaloit/
- https://napelem.blog.hu/2015/11/05/hogyan_keszul_a_napelem_eloallitasanak_legelterjedtebb_modja
- https://greenbuilding.hu/epuletminositesi-rendszerek-leed-breeam/

Ecosystem services:

- https://ec.europa.eu/environment/pubs/pdf/factsheets/Eco-systems%20goods%20and%20Services/Ecosystem_HU.pdf

Ecovillage:

- http://www.gyurufu.hu/ - ökofalu
- https://okofaluszervezes.blog.hu/2010/08/29/magyarorszagi_okofalvak_elhelyezkedesuk
- https://energy-cities.eu/seven-cities-on-a-zero-carbon-journey/
- https://www.euronews.com/living/2020/03/10/what-s-life-like-inside-the-uk-s-first-zero-carbon-eco-village
- https://nachhaltigwirtschaften.at/en/hdz/projects/zero-carbon-village-energy-autarcic-settlement.php

Building classification system:

- https://www.hugbc.hu/zold-minositesek-tudastar

Eco-mapping:

- http://kovet.hu/wp-content/uploads/2019/10/Okoterkepezes_fuzet_2006.pdf

References:

Cummings, C.–Feyertag, J.–Gelb, S.–Hart, T.–Khan, A.–Langdown, I.–Lucci, P.–Murali, M. (2018) *10 things to know about the impacts of urbanisation (Briefing paper)* (https://www.odi.org/publications/11218-10-things-know-about-impacts-urbanisation; downloaded on 1 February 2021)

OECD (2020). *Cities in the World, A New Perspective on Urbanisation.* European Union (https://www.oecd.org/publications/cities-in-the-world-d0efcbda-en.htm; downloaded on 1 February 2021)

Prof. Dr. Kovács Z. –Vida G. (2019) *Urbanizáció (elektronikus tananyag)*. [Urbanisation (electronic material)]. Szegedi Tudományegyetem. Szeged (http://eta.bibl.u-szeged.hu/2090/1/EFOP343%20AP2%20Kov%C3%A1cs%2C%20Z.%20-%20Vida%2C%20Gy.%202019%20tananyag-fejleszt%C3%A9s%20100%25%20jav%C3%ADtott_v%C3%A9gleges.pdf; downloaded on 1 February 2021)

Ritchie, H. – Roser, M. (2018). *Urbanization.* (https://ourworldindata.org/urbanization; downloaded on 1 February 2021)

We should approach recycling from a completely different angle (https://raketa.hu/korkoros-gazdasagi-modell; downloaded on 1 February 2021)

United Nations (2019). *World Urbanization Prospects* (https://population.un.org/wpp/; downloaded on 1 February 2021)

III. RECOMMENDATIONS FOR LESSON PLANS

Lesson 1

Topic of the lesson: Building materials in nature

Time required: 1 lesson

Pedagogical objective: – identifying the origin of building materials;
– recognising how much we use nature's materials in a transformed way.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
2 minutes	Forming groups	Hand out the slips of paper with the titles of the articles in the chapter to the students. Those with the same titles will be in the same group.	frontal	slips of paper with the titles of the articles, followed by a number (e.g. Biomimicry 1, Biomimicry 2, etc.)
10 minutes	Discussing the article	The groups should discuss an article using cooperative learning techniques: each group collects 5-10 relevant ideas for the given article.	small groups, cooperative learning techniques	own notebook or notepaper, pencils, pens for note-taking
10 minutes	Building materials in nature	The groups should solve the *Building materials in nature* exercise in the workbook.	small groups, classroom work	use of textbook and internet to gather information
10 minutes	How good is a building?	The groups should create their own building classification system by solving the *How good is a building?* exercise in the workbook.	small groups, classroom work	using the textbook and the internet to gather information, paper, pencils, felt-tip pens
13 minutes	How good is a building?	The groups should present and discuss each other's building classification systems. Are any points the same for more than one group? Teacher and peer evaluation based on the appropriateness (validity) of the selected criteria.	small-group, frontal presentation	-

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
SEN recommendations When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group. Make sure to split into heterogeneous groups. When discussing the text with cooperative learning techniques, students with reading disabilities should read shorter texts. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to set rules for discussion to avoid conflicts. In solving the tasks and in group work, they can be given activity tasks that provide them with the opportunity to move around or maintain their attention under appropriate conditions.				

Lesson 2

Topic of the lesson: Eco-mapping

Time required: 1 lesson

Pedagogical objective: – learning the principles and methods of eco-mapping;
– during the eco-mapping exercise, and with their own observations, identify the good features of a building and the ones that need to be improved and developed;
– finding development opportunities.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Forming groups	Set up groups online or using a mobile phone's random group generator.	frontal	It is advisable to prepare the class list electronically in advance so it can be easily copied into the interface.[1]
25 minutes	Eco-mapping	Based on the *Eco-mapping* article, the groups should make an eco-map of their school on the attached floor plan. Outline the development opportunities.	small group task	photocopies of the school floor plan according to the number of

[1] https://www.randomlists.com/team-generator?grp=6&items=Brock+%0AGale+%0AGustavo+%0AHank+%0AHector+%0AHolly+%0AJane+%0AJesse+%0ALydia+%0AMarie+%0AMike+%0APete+%0ASaul+%0ASkyler+%0ATodd+%0AWalter
https://www.keamk.com/random-team-generator

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
				groups, pencils, felt-tip pens
15 minutes	Presentation of the eco-maps	Show each other the eco-maps you have made. Teacher and peer evaluation of the plans, selecting the best proposals. If there are development proposals that are shared by several groups, get together to implement them.	group, frontal presentation	-
SEN recommendations Reading and interpreting the article *Eco-mapping* independently can be a problem for dyslexic learners. It is recommended to read the article in groups with students who read well. Students with dyscalculia and disorders of spatial orientation may have difficulty understanding the school floor plan, so other members of the group should be asked to help them. Provide visually impaired students with a floor plan with clear outlines (using green on a yellow background) and, if possible, in a larger format or in a scalable electronic format, to make it easier for them to see and understand.				

Lesson 3

Topic of the lesson: Ecovillage and energy

Time required: 1 lesson

Pedagogical objective: – identifying the challenges posed by growing towns and the possible courses of action to address these challenges;
– creating the need for conscious design when considering building materials and energy consumption.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Forming groups	Students should draw a slip of paper with the name of an ecovillage. Those with the same village name form a group.	frontal	slips of paper with the names of ecovillages
25 minutes	Design an ecovillage.	Based on the recommended articles in the textbook and the information gathered online, the students should solve the exercise *Design an ecovillage of 300 homes*	small groups, classroom work	internet access, paper, felt-tip pens, pencils

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		in the workbook. The group should also draw up a sketch map of the ecovillage.		
15 minutes	Presentation of the ecovillage plans	Show your ideas to the others. Teacher and peer evaluation of the plans, selecting the best proposals.	frontal, small-group presentations	

SEN recommendations

For pupils with learning or attention difficulties, memory problems or hearing impairments, it is recommended to continue the digital glossary they started in previous lessons, including, for example, eco-map, ecovillage, urbanisation, etc. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms.

Reading and interpreting the recommended articles in the textbook independently can be a problem for dyslexic learners. It is suggested that students work in groups to read one article each, and then discuss the articles together. Students with dyslexia or other reading difficulties should be given a short article to read or let them choose one that interests them. Many conflicts can be prevented by allowing pupils with behavioural problems, attention difficulties or autism spectrum disorder to choose.

Ensure that students with dyscalculia have access to the necessary aids when solving the exercise *Design an ecovillage of 300 homes.* Put them into a group where the other members of the group have no difficulty solving mathematical problems. When they allocate tasks in the group, suggest that the students with dyscalculia solve exercises d) and e).

Lesson 4

Topic of the lesson: Sustainable economy

Time required: 1 lesson

Pedagogical objective: – understanding the approach of a circular economy model and how it works;
– learning about the sustainable economic model rather than the promise of constant growth;
– developing the competences needed for self-employment.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Sustainable economy	Reading the article *Paper furniture, but not a doll's house*, then discussing the circular economy model and identifying its types.	working individually, frontal discussion	internet access, tablet/laptop/smartphone
3 minutes	Group formation	The students should line up in order of height, then each draw a coloured slip of paper from a box. Those choosing the same colour are grouped together. (This grouping method gets students moving, so they move out of their usual place and start a new task more easily.)		a box to draw from, coloured slips of paper with the same number of colours as the number of groups, and as many slips as you want people in the groups
15 minutes	The idea of an enterprise based on the circular economy model	Planning an enterprise based on the circular economy model in the *Our sustainable enterprise* exercise.	small groups	-
17 minutes	Presentation of business plans	Show your ideas to the others. Teacher and peer evaluation of the plans, selecting the best proposals.	frontal, small-group presentations	-
SEN recommendations Reading and interpreting the article *Paper furniture, but not a doll's house* independently can be a problem for dyslexic learners. It is recommended that group members read only part of the article. Students with reading difficulties should read shorter texts. Pupils should share what they have read. While others read, students with				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
reading difficulties can research the circular economy model on the internet, then share the results with their fellow group members. In solving the problems, you can rely on the creativity and imagination of students with special educational needs, often with futuristic ideas that are a little out of touch with reality. You should point out the rules for group work to students who have difficulty following the rules.				

Lessons 5-6

Topic of the lesson: City of the future – your city

Time required: 2 lessons (it is recommended to combine the lessons)

Pedagogical objective: – understanding the components of sustainable urban development;
– recognising the mutually supportive effect of the parts.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Group formation	How to set up groups: a) Form 7 groups using the titles of the role cards in the exercise. b) Set up groups of 3-5 people using one of the familiar methods, and each group receives all the role cards. By setting up the groups, we can focus the students' attention on two things: a) In the first case, those choosing the same role are grouped together. b) In the second case, the role cards for the task are distributed to the teams, and they decide within the team who takes which role.	frontal	role cards
50 minutes	City of the future – your city	Creating a complex urban development plan based on the *City of the future – your city* exercise. Areas: - transport	small groups	large paper, pencils, felt-tip pens, role cards to assign roles of commissioners

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		- energy supply - water supply - protecting nature - waste - becoming a "smart city" - society, equal opportunities Students should be given the opportunity to include other aspects.		
30 minutes	Presentation of the City of the future project	Presenting the completed projects to each other. Teacher and peer evaluation of the plans, selecting the best proposals	frontal, small-group presentations	
Other suggestions: It is also possible to work on the topic by having students complete the urban planning task as an extra-curricular activity over a set period, e.g. 2 weeks. In this case, there is more time for the presentation of the completed plans and for joint assessment. If you choose this method, you should prepare a set of assessment criteria in advance, which students can use when assessing each other's work. Possible aspects: - level of detail in each area, - implementation of sustainability approach, - systems thinking, - feasibility.				
SEN recommendations In solving the problems, you can rely on the creativity and imagination of students with special educational needs, often with futuristic ideas that are a little out of touch with reality. You should point out the rules for group work to students who have difficulty following the rules. Note that it is not necessary or evident that the role of Commissioner for equal opportunity should be filled by the pupil with special educational needs.				

IV. Recommendations and suggestions for the exercises in the textbook and workbook

a) How good is a building?

Topic, subject	How good is a building?
Position of exercise in teaching process	The exercise provides help with processing content.

Time required for exercise (minutes, hours, days)	Including preparation, 5 + 30-40 minutes depending on the level of detail of the task and the presentations of the finished works.
Prior knowledge and definitions needed for the exercise	Energy saving, energy efficiency Passive house, carbon neutral house
Aim of the exercise	Understanding that the 'merits' of buildings can be affected by many factors, and that buildings can provide different qualities of environment for the people who live there.
Competences that the exercise develops	Strategic competence Creativity in solving sustainability problems Systems thinking
Tools needed for the exercise	paper, pencils, felt-tip pens, internet access
Where	classroom
Preparing the task	-
Internet resources that students can use (for classroom and homework)	https://greenbuilding.hu/epuletminositesi-rendszerek-leed-breeam/ https://www.hugbc.hu/zold-minositesek-tudastar
Recommended resources for teacher preparation	https://greenbuilding.hu/epuletminositesi-rendszerek-leed-breeam/ https://www.hugbc.hu/zold-minositesek-tudastar

INSTRUCTIONS FOR THE EXERCISE

In small groups, students should create their own building classification system and criteria by using the recommended articles in the textbook and information from the internet.

Discuss what makes us feel comfortable in a building?

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Method, working style	Tools	Notes
2 minutes	Group formation	frontal	Hand out the slips of paper with the titles of the articles in the chapter to the students. Those with the same titles will be in the same group.	

Time	Activity	Method, working style	Tools	Notes
10 minutes	In small groups, students should create their own building classification system and criteria by using the recommended articles in the textbook and information from the internet.	small-group cooperative problem solving	large sheet of paper, felt-tip pens, pencils	
10 minutes	Students should show each other their rating system ideas. Teacher and peer evaluation based on the appropriateness (validity) of the selected criteria	small-group presentation	outline of the completed rating system	

b) Make an eco-map of your school.

Topic, subject	Eco-map of my school
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	Including preparation, 5 + 35-40 minutes
Prior knowledge and definitions needed for the exercise	Energy saving, energy efficiency
Aim of the exercise	Making an eco-map of a building, showing in graphic form the parts of the building that work well, as well as the development opportunities.
Competences that the exercise develops	Strategic competence Creativity in solving sustainability problems Systems thinking
Tools needed for the exercise	paper, pencils, felt-tip pens, internet access, school floor plan
Where	classroom
Preparing the task	Photocopies of the school floor plan according to the number of groups
Internet resources that students can use (for classroom and homework)	http://kovet.hu/wp-content/uploads/2019/10/Oko-terkepezes_fuzet_2006.pdf
Recommended resources for teacher preparation	http://kovet.hu/wp-content/uploads/2019/10/Oko-terkepezes_fuzet_2006.pdf

INSTRUCTIONS FOR THE EXERCISE
Eco-mapping is the assessment and graphical representation of the environmental impacts of companies, so it is a methodology used mainly by companies that is found on the internet In small groups, students should create an eco-map of their school by using the recommended articles in the textbook and the information on the internet. They should show on the map which parts of the school building they are satisfied with and in which parts they find room for development. Development opportunities should also be discussed with the student council and the school management.

MAIN STEPS TO SOLVE THE TASK				
Time	Activity	Method, working style	Tools	Notes
2 minutes	Group formation	large group		
15 minutes	Students should go through the school building in small groups, and identify the parts of the building that are good, and those that require improvement (where they notice a problem).	small-group cooperative problem solving	large sheet of paper, felt-tip pens, pencils, school floor plan	
20 minutes	Create the eco-map. Highlight both the problems and the good parts of the building. Students should brainstorm development opportunities.	small groups, classroom work	large sheet of paper, felt-tip pens, pencils, school floor plan	
8-10 minutes	Students should show each other their eco-maps and the development opportunities. Teacher and peer evaluation of the plans, selecting the best proposals.	small-group, frontal presentation		

c) Growth and development of towns

Topic, subject	Growth and development of towns
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	Including preparation, 5 + 35-40 minutes.

Prior knowledge and definitions needed for the exercise	Municipality, village, town, energy saving, energy efficiency
Aim of the exercise	Understanding individual and community energy consumption, assessing the amount of energy needed to operate buildings and how to secure this energy.
Competences that the exercise develops	Strategic competence Creativity in solving sustainability problems Systems thinking Mathematical/logical skills
Tools needed for the exercise	paper, pencils, felt-tip pens, internet access
Where	classroom
Preparing the task	Ask students to check the monthly average gas consumption of their own house.
Internet resources that students can use (for classroom and homework)	https://kp.hu/hoszukseglet-a-normal-az-energiatakarekos-es-a-passziv-hazak-tekinteteben/ https://okofaluszervezes.blog.hu/2010/08/29/magyaror-szagi_okofalvak_elhelyezkedesuk
Recommended resources for teacher preparation	https://kp.hu/hoszukseglet-a-normal-az-energiatakarekos-es-a-passziv-hazak-tekinteteben/ https://okofaluszervezes.blog.hu/2010/08/29/magyaror-szagi_okofalvak_elhelyezkedesuk https://nvsolar.hu/mekkora-napelemes-rendszert-erdemes/

INSTRUCTIONS FOR THE EXERCISE

In small groups, students should track the energy consumption of a single house and of the entire village of 300 homes/houses. You can also do the calculations together. Based on the calculated energy demands, the groups should brainstorm on ways to provide energy.

By gathering information online, the groups should determine what capacity of machinery and equipment needs to be installed to cover the energy demands of the buildings.

When each group has completed its project, present them to each other.

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Method, working style	Tools	Notes
2 minutes	Group formation	frontal		

Time	Activity	Method, working style	Tools	Notes
5 minutes	Working in small groups, students should find examples of ecovillages in Hungary.	small groups, classroom work	internet access, mobile phone	
15 minutes	The groups should calculate the energy demands of their own residential buildings.	small groups, classroom work	calculator	This requires information on the gas consumption of the students' houses/homes.
15 minutes	Students should use the internet to gather ideas on how to secure the energy supply, and estimate the capacity of the equipment needed to do so. List what ecosystem services could be used.	small groups, classroom work	internet access, mobile phone	
8 minutes	Presentation of energy supply concepts in ecovillages Reviewing each concept, selecting the best solutions	small-group, frontal presentation		

Proposal for solving the task

a) Brainstorm ideas for designing an ecovillage of 300 homes and its energy supply.
To complete the task, look into what a circular economy means. You can find an interview for this in the textbook.
- Find an example of an ecovillage; draw inspiration from existing settlements.
- The monthly average electricity consumption of 150 kWh mentioned in the articles of the textbook is for a conventional building. Passive houses can only use up to $^{1}/_{12}$ of this (although building regulations for passive houses are getting stricter all the time).

b) Calculate the energy consumption of the village of 300 homes with both conventional buildings and passive houses. How many cubic metres of gas and/or MJ of energy do you consume per year? (As a basis for the calculation, look at the gas bill of your own house.)
The data received determines the consumption for the houses in the model settlement. For the sake of the summary, convert the gas consumption to kWh as well. You can find help for the conversion online.

	conventional building		eco-settlement building	
electricity consumption per home	KWH/month	KWH/year	KWH/month	KWH/year
	150	1,800	200	2,400
gas consumption per home	m^3/month	m3/year	m^3/month	m3/year
	120	1,440	0	0
	MJ/month	MJ/year	MJ/month	MJ/year
	3,835	46,020	0	0

Time	Activity	Method, working style	Tools		Notes
		KWH / month	KWH / year	KWH / month	KWH / year
		1,065.27	12,783	0	0
Total energy consumption per home		KWH / month	KWH / year	KWH / month	KWH / year
		1,215.27	14,583.24	200	2,400
Total energy consumption of a village with 300 homes		KWH / month	KWH / year	KWH / month	KWH / year
		36,458.1	437,497.2	6,000	72,000

c) What capacity and what kind of system (solar, heat pump, wind, local small hydro, etc.) would you install to cover the energy demands of the ecovillage?
Since both energy production and consumption entail losses, the capacity required can be planned at 120% of the annual consumption. What are the advantages of your chosen system?
For solar demand, multiply the annual electricity demand by 0.8.

- *This is per house: (2,400 kWh/year) x 0.8 = 1,920, i.e. 1.92 kW of solar panels would be needed to meet the cooling/heating and other electricity consumption. (More precisely, this would mean a system with a capacity of 1.92 kWp. The kWp is the maximum power output of a solar panel under ideal conditions.) This needs to be increased to 1.92 kW x 1.2 = 2.3 kW for losses, so a total of 2.3 kW of solar panels per house is needed.*
- *If you want to meet the energy needs of the entire village of 300 homes, then:*
  (72,000 KWh/year) x 0.8 = 57,600, which would require 57.6 kW (more precisely 57.6 kWp) of power. Multiplying this by 1.2 for losses, a solar PV system with a capacity of 69.12 kW (69.12 kWp) would be able to provide the required amount of energy.
- *A heat pump with surface heating would be used for heating and cooling.*

d) What local ecosystem services could you use, and how?
For example, drinking water purification, erosion regulation, water regulation and wastewater treatment, air quality regulation, aesthetic values of raw materials, recreation and ecotourism, mental and physical health. Houses in the ecovillage collect and reuse greywater before it is discharged into the sewer. When building houses, use sustainable materials. Use demolition materials where possible, and choose building materials that use as little energy as possible.

d) Sustainable enterprise

Topic, subject	Sustainable enterprise
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	Including the preparation: 10 + 40 minutes

Prior knowledge and definitions needed for the exercise	-
Aim of the exercise	Learning about the circular economy model, as well as the sustainable economic model rather than the promise of constant growth. Developing the competences needed for self-employment.
Competences that the exercise develops	Systems thinking Employee and innovation competences, enterprise skills Strategic competence
Tools needed for the exercise	paper, pencils, felt-tip pens, internet access, mobile phone
Where	classroom
Internet resources that students can use (for classroom and homework)	https://www.europarl.europa.eu/news/hu/headlines/economy/20151201STO05603/korkoros-gazdasag-mit-jelent-miert-fontos-es-mi-a-haszna https://raketa.hu/korkoros-gazdasagi-modell
Recommended resources for teacher preparation	https://www.europarl.europa.eu/news/hu/headlines/economy/20151201STO05603/korkoros-gazdasag-mit-jelent-miert-fontos-es-mi-a-haszna https://raketa.hu/korkoros-gazdasagi-modell

INSTRUCTIONS FOR THE EXERCISE

In groups, students should read the textbook article *Paper furniture, but not a doll's house,* then use the internet to gather information on the types of circular economy model.

Brainstorm ideas on what kind of enterprise they would start to implement the circular economy model, and develop an outline of how the enterprise would operate, then present it to each other.

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Method, working style	Tools	Notes
2 minutes	Group formation	large group	-	
10 minutes	In small groups, students should read the textbook article *Paper furniture, but not a doll's house,* then use the internet to gather information on the types of circular economy model, and possibly also look for specific enterprises.	small groups, classroom work	internet access, mobile phone	

Time	Activity	Method, working style	Tools	Notes
25 minutes	Business planning: the groups brainstorm activities to be carried out in a circular enterprise, and draw up an outline of how the enterprise will operate.	small groups, classroom work	internet access, mobile phone, paper, pencils, felt-tip pens	
8 minutes	Presentation of business ideas using the circular economy model to other groups.	small-group presentation	-	

e) City of the future – your city

Topic, subject	City of the future – Your city
Position of exercise in teaching process	The exercise provides help with processing content.
Time required for exercise (minutes, hours, days)	Including the preparation. 5 + 35-40 minutes
Prior knowledge and definitions needed for the exercise	Energy saving, energy efficiency Smart City Urbanisation
Aim of the exercise	Recognising that a settlement is a multi-stakeholder and multi-factor system, in the sense that its services and infrastructure determine the quality of life of its inhabitants. Understanding how a settlement is organised around areas, activities and services.
Competences that the exercise develops	Strategic competence Creativity in solving sustainability problems Systems thinking
Tools needed for the exercise	paper, pencils, felt-tip pens, internet access, Sellotape or Blu-Tack
Where	classroom
Preparing the task	Prepare the role cards for the task.
Internet resources that students can use (for classroom and homework)	–
Recommended resources for teacher preparation	–

INSTRUCTIONS FOR THE EXERCISE
By setting up the groups, we can focus the students' attention on two things: a) Form 7 groups using the exercise role cards, and those choosing the same role are grouped together. b) Form groups of 3-5 people using one of the familiar methods. Hand out the role cards to the teams, and they decide within the team which part(s) to take on. Groups should brainstorm and draw sketches of the development areas of the municipality according to the roles assigned. You can complete the task according to the way the group was formed: a) The groups work on a separate development area, then take time to put the separate development areas together as a unit. To do this, draw up a plan together on the board, combining the ideas from the different areas. b) Each group comes up with complex ideas for urban development, present them to each other, and vote on the best idea.

MAIN STEPS TO SOLVE THE TASK				
Time	Activity	Method, working style	Tools	Notes
3 minutes	Forming groups with role cards (as previously learned)	large group	role cards for the task	
20-30 minutes	Drawing up an urban development plan: in small groups, the students should elaborate on their urban development ideas according to the group formation under a) or b).	small groups, classroom work	internet access, mobile phone, paper, pencils, felt-tip pens	
10-20 minutes	a) The groups should put together ideas from different development areas on the board to form a common development plan. b) The groups should present their own development concept.	small-group presentation	whiteboard, large paper, Sellotape or Blu-Tack, felt-tip pens, pencils	

IV. Other ideas for working with the textbook

a) The *City of the future – Your city* workbook exercise was completed in digital education with an online whiteboard interface that was shared with students and edited live. This live video session gave students the opportunity to work in small groups. Some of the results of the exercise are shown below.

b) See the exercise in the chapter *Biomimicry in architecture* in the textbook:

Look at the examples taken from nature in the world of architecture or medicine, engineering or even design. If you are interested in other fields, look for examples of biomimicry there.

This exercise can be a homework assignment to gather information, then prepare a short presentation to introduce the projects *City of the future – your city* and *Our common space*. For example birds do not fly into cobwebs as the cobwebs are detected by birds that are sensitive to UV light. With this knowledge, fibres are placed in the windows of skyscrapers that are invisible to us, but the birds can see them thanks to UV light. This way they don't

mistake the large, sky-like glass surfaces and don't fly into buildings. The wingtips of airplanes are made to slope upwards, which reduces the drag from wingtip vortices. This idea was taken from the wings of birds of prey.

Source of the image: https://www.pikist.com/free-photo-sllth/hu, 30 January 2021

Ants use chemical communication and democratic persuasion to prompt their peers to find a good food source or a new hiding place. Using the principle of swarm intelligence, which is typical of social insects, robots can be programmed to search for survivors in disaster areas. This way, if a robot finds an injured survivor, it can call on other robots to help.

IN TOP FORM

Eco-conscious healthy lifestyle

A guide to working with the In top form magazine

Purpose of this issue	Objectives of the framework curriculum: - Developing a complex approach that combines the need for a healthy lifestyle with recognising the importance of sustainable development and environmental protection. - Modifying individual eating habits in response to healthy lifestyles and environmental impact. - Recognising the environmental impacts of food production.
Time frame	6 lessons
Links within the textbook and between subjects	This topic forges close links with the chapters *Naturally is best!* and *On the Road?* Connections with other subjects in grades 9-10: i) Biology - Human body and health - Balance of the biosphere - Sustainability j) Geography

	- Hydrosphere - Local problems, global challenges, dilemmas for a sustainable future
Focus on skills development	The students: - can identify what health is (biological, emotional, social, spiritual, mental dimensions); - argue about the aspects of a healthy lifestyle, possible ways of maintaining it and the factors that hinder it; - describe the causal and inextricable link between a healthy environment and human health, and the various environmental elements; - can plan a way to achieve a personal goal, taking into account environmental conditions and their own capabilities (e.g. lifestyle, nutrition, exercise, clothing, relationship with nature); - argue for waste reduction solutions linked to food consumption; - can plan their shopping and meals in an environmentally responsible way.

I. METHODOLOGICAL RECOMMENDATIONS FOR WORKING WITH THE TOPIC

It is important to note that the focus of this issue and the information herein is not on teaching and learning new knowledge. The emphasis is placed on developing skills, and most importantly, applying them and raising awareness.

The learning process is guided by joint teacher-student methods and the active dominance of the student. At the same time, the leading role of the teacher is pushed into the background, and they should act as catalysts, as mentors. One characteristic of the textbook as a whole is that good student performance is not measured by the number of right answers, but by the active participation of the student and their ability to put sustainability first, which comes to the fore much more in this issue.

In terms of teaching methods, we recommend discussions, debates, the project method and cooperative learning for working with this issue. There is no preferred way, method or form for organising learning; frontal as well as individual, pair, small-group or differentiated work is entirely appropriate. It is up to the teacher to decide which is the most appropriate for the class.

The workbook accompanying the textbook and the instructions given here are only guidelines. It is important for teachers to create an environment (atmosphere) where students feel safe, can openly voice their opinions, and are given the chance to express and defend them within the appropriate framework, as well as discuss their different views. This contributes to the development of both their

communication skills and their social competences. Depending on the students' interests, the topic can be further expanded or certain elements can be narrowed down.

II. Suggested literature and resources for teacher preparation and working with material

Different teaching methods and how they can be used:

- https://ofi.oh.gov.hu/tudastar/problemak-kerdesek/oktatasi-modszerek
- https://ofi.oh.gov.hu/az-osztalytermi-gyakorlat

Lente G.–Gunda T.–Csupor D.–Kovács L. (2011). Száz kémiai mítosz. Tévhitek, félreértések, magyarázatok **[100 Chemical Myths. Misconceptions, misunderstandings, explanations]*. Akadémiai Kiadó. Budapest***

III. RECOMMENDATIONS FOR LESSON PLANS

Lessons 1–2

Topic of the lesson: The essence of health

Time required: 2 lessons (it is recommended to combine the lessons)

Pedagogical objective: – students to understand the holistic, complex unity of health;

– be able to explain the dynamically changing concept of health;

– be able to position their own state of health in this system;

– be able to identify the factors that put their health at risk.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary prep-aration
7 minutes	Defining health	Before the lesson, the teacher writes down on Post-it notes the conditions that affect health negatively. Examples for the notes: depressed, blind, overweight, alcoholic, bulimic, cancer patient, flu patient, hangover, gambling addict, shopping addict, arthritis, phobic, broken arm, headache, etc. Each pair, group or individual receives a slip of paper. Question: Can a person who lives with these phenomena and conditions be called healthy? Find out! Justify your answer.	frontal, working in small groups or in pairs, depending on the size, composition and mood of the class Make sure that no one is adversely affected by an illness or condition. For details see SEN recommendations	paper, writing utensils
7 minutes	Dimensions of health	Using the notes from the previous exercise, students should identify what "areas" are affected by the phenomena and situations on the papers? (e.g. physical, mental, etc.) It is worth setting up groups according to the areas defined. Each group should try to define	frontal, working in small groups or in pairs, depending on the size, composition and mood of the class	paper, writing utensils

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		what that area – also known as health dimension – might cover. Cross check: textbook p. 123.		
7 minutes	Factors influencing health	Based on the grouping in the textbook (p. 124), students collect examples of each factor, and discuss their role in influencing health. The conditions on the paper notes previously used are assigned to each factor.	working in groups or pairs, frontal discussion with teacher questions (question and answer)	textbook
24 minutes	Summary	Create a mind map based on task 1 on page 61 of the workbook.	working in small groups or in pairs	workbook
45 minutes	Assessing your own health	Complete Task 2 on page 61 of the workbook. First, a diagram illustrating the state of health of a fictitious child in a situation invented by the teacher should be compiled together, and assessed based on the criteria of the exercise. Afterwards, working individually or in pairs, they should draw their own or their classmate's state of health on the spider web chart, and provide practical tips and activities to improve their health. The students should be told that the tips to improve their health should be realistic, have specific measurable values, and a deadline. A link to the following or a similar page can be recommended: https://pszichologuskereso.hu/blog/celkituzes-hatekonyan-avagy-mit-jelentenek-smart-celok	working individually or in pairs	workbook, paper, writing instruments
SEN recommendations Some of the signed slips of paper used to define state of health may be specific to students with special educational needs, both as conditions and as diseases. For this reason, the teacher should choose the notes				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary prep-aration
carefully. Consult the form teacher, the students' special education teacher and the school psychologist beforehand. When organising frontal classwork, try to create a discrete environment, an atmosphere of trust, and communicate without grading. In the case of students with speech impairments or autism spectrum disorder, you should only ask them to speak in front of the class if the student volunteers to do so. Students with emotional disturbance and psychosocial disabilities, which are still poorly understood but diagnosed as a condition, as well as students with attention difficulties, behavioural problems, hyperactivity, etc., may be particularly affected by the topic (e.g. gambling addiction, eating disorders, etc.), as are the majority of students who are not diagnosed. The exercise in the workbook should be completed in small groups, as this way the tasks can be distributed within the group according to each special educational need. When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group. The rules for group work and the activities, responsibilities and rights associated with the tasks assigned in the group should be clear and transparent for students with behavioural problems or autism spectrum disorder. If you can, give them a choice that suits the teaching material and the tasks. The topics of the magazine can have a strong impact on the emotional lives of students, including those with special educational needs. It is advisable to explain before the tasks what will become public after solving and working on the tasks, what will be shared with a pre-selected classmate and what will remain secret, and won't be seen or known by others. The linked article https://pszichologuskereso.hu/blog/celkituzes-hatekonyan-avagy-mit-jelentenek-smart-celok may be long and difficult to understand for students with dyslexia and other reading difficulties. For them, it is necessary to hand out and discuss a brief summary of setting SMART goals.				

Lesson 3

Topic of the lesson: Food supply

Time required: 1 lesson

Pedagogical objective: – students to understand the local economic stimulus of buying local food,

– learn about the benefits of short supply chains and how to avoid risks.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
3 minutes	Group formation	Forming small groups of 4-5 people.	let the students form their own groups	-
10 minutes	Food supply and environmental impact	Students should read the relevant articles on pages 125 and 126 of the textbook, make notes based on the articles, then communicate the main message of the articles.	small-group task	textbook, workbook
17 minutes	Food supply and environmental impact	Working in small groups, they should solve the related task in the workbook (task 7 on page 63 and task 3 on page 62 of the workbook). Students can also draw a diagram to help them solve the problems.	small-group task	textbook, workbook paper, writing and drawing utensils
15	Presentation of completed tasks	The results should be presented to the class by a selected spokesperson of each group. The other groups should evaluate the solution of the task according to its complexity and level of detail. The best solutions can be used to create an information poster in the hallway, in the school paper or on the internet.	small-group task	-
SEN recommendations The articles may be long and difficult to understand for students with dyslexia and other reading difficulties. I recommend reading and familiarising the students concerned with the content that is essential to complete the task successfully.				

Lesson 4

Topic of the lesson: Eco-conscious food

Time required: 1 lesson

Pedagogical objective: – learn about the characteristics of good quality foods with a minimum environmental impact;

– students can plan their shopping and meals in an environmentally responsible way, taking into account the conditions available.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Solve exercise 5 on page 62 of the workbook. Collect and organise arguments – if possible, on a projector or on a whiteboard	frontal or working in pairs, depending on the size, composition and mood of the class	workbook paper, writing utensils
15 minutes	Healthy, environmentally conscious food choices	Students should read the article *The five healthiest cuisines in the world* on page 132 in the textbook. Draw up a table of positive traits. Look for common features.	working in pairs or small groups depending on the size, composition and mood of the class	textbook, workbook paper, writing utensils
15 minutes	Healthy, environmentally conscious food choices	Solve exercise 16 on page 66 of the workbook. At the end, they should put together a healthy Hungarian menu. They should justify their choices. The solutions should be presented by the pairs or the group's spokesperson.		
10 minutes	Evaluation	The class should vote on which menu is the healthiest. Students should reflect on the solutions they come up with.	frontal	
SEN recommendations				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
We recommend reading and familiarising the students concerned with the content that is essential to complete the task successfully. Working in groups, students should read an article or part of an article. Those with reading difficulties should read shorter parts, then share the content of the article. When solving exercise 20, students with dyscalculia can also use the required aids.				

Lesson 5

Topic of the lesson: Water consumption

Time required: 1 lesson

Pedagogical objective: – students to make informed and environmentally responsible choices about their water consumption;

– be able to justify their choice, interpret others' arguments and, if necessary, change their minds in the light of new information.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Concept of virtual water. Students should solve exercise 13 on page 64 of the workbook. Students should compare the solutions.	working in pairs, frontal checking	workbook paper, writing utensils
30 minutes	Debate on water	Exercise 7 on page 142 in the textbook Students should split into three groups. One group should argue in favour of drinking tap water, another in favour of drinking bottled mineral water, and the third should be a team of consumers. The first two teams should prepare and argue for the position they have been given. They should try to convince as	using debate and argumentation (see https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0050_12_modszertan/ch02s22.html)	textbook, paper, writing utensils

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		many consumers as possible of their position. Consumers should choose between the options and justify their choice.		
10 minutes	Drinking water	Page 134 in the textbook – Environmental Shame Award – Students should collect arguments to justify the award. Let's sort the arguments according to the principle of sustainability they violate.	working individually	Projecting of short description
SEN recommendations For pupils with learning or attention difficulties, memory problems or hearing impairments, it is recommended to continue the digital glossary they started in previous lessons, including, for example, virtual water, water packaging, etc. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to set rules for discussion to avoid conflicts. In solving the tasks, they can be given activity tasks that provide them with the opportunity to move around or maintain their attention under appropriate conditions.				

Lesson 6

Topic of the lesson: Air pollution

Time required: 1 lesson

Pedagogical objective: – enable students to integrate their health and environmental awareness.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
20 minutes	Climate change	Students should work in pairs to read the weather report on page 139 of the textbook. List the reasons that could have led to such a forecast. The reasons should be linked to the processes that brought them about, and how they could have been avoided. Make flow charts related to the changes in each weather element. The groups should present their own flowcharts. Then the students should organise what was heard and summarise it in a short report.	working in pairs	textbook
10 minutes	Air pollution	Working in pairs, students should solve exercise 25 on page 69 of the workbook.	working in pairs	workbook, paper, writing instruments
15 minutes	What's the air like here?	Students should describe the air quality where they live – they should propose adjectives to be written on the board. Group the characteristics and link them to what causes them and what they are due to. Work individually to make recommendations to maintain/improve air quality. A list of the best recommendations should be drawn up and shared on social media.	Frontal discussion, working individually	
SEN recommendations When solving exercise 25, students with dyscalculia can also use the necessary aids. Students with dyslexia may need help with reading tasks.				

IV. Recommendations and suggestions for the exercises in the textbook and work-book

a) Think, create, research!

Topic, subject	Conscious consumer
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	The teacher decides on the duration of the task. If you only want to touch on the task, it can be 45 minutes including preparation and implementation, or even less if the task has not aroused the students' interest. It can also be organised by providing a few days to prepare so you can discuss the topic in more detail.
Prior knowledge and definitions needed for the exercise	The exercise does not require any particular prior knowledge, the depth of discussion depends on the level of prior knowledge.
Aim of the exercise	Learn about different points of view, learn how to argue and have a civilised debate. Learn how to search for relevant, credible information.
Competences that the exercise develops	Identifying needs and wants.
Tools needed for the exercise	paper, pencil, possibly laptop, projector (if one of the teams also prepares a presentation)
Internet resources that students can use (for classroom and homework)	—
Recommended resources for teacher preparation	https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0050_12_modszertan/ch02s22.html
INSTRUCTIONS FOR THE EXERCISE	
Split into three groups. - one should be made up of representatives of an oil palm plantation company producing for the global market, - one with members of a local environmental and rights organisation, - and the third should be a team of customers. The first two teams should prepare and argue for and against the use of palm oil. Try to convince as many customers as possible of your point of view.	

MAIN STEPS TO SOLVE THE TASK
Using the debate method Split the class into 3 groups. (There can be 4 groups; in this case the 4th group is a maximum of 3 people and is responsible for the debate.) Explain the procedure and rules of the debate. Only after the rules and the timetable have been explained should you identify which group will perform each function. Both debating teams are given 5-8 minutes to collect and write down their arguments and questions. Meanwhile, the team of consumers should vote on which solution they would choose. The result should be recorded. While the two teams prepare, ask them to write down whether they see any chance of changing their minds, and if so, what might change their minds. Draw lots to decide which team should start the list of arguments. Do not interrupt. Time management for teams: - Teams 1 and 2 have 3-5 minutes. - Teams 1 and 2 will have 2 minutes for reflection and questions to the other team. Maybe another round of 1 minute each. Second-round voting for consumers: comparing results. Results: the team with more votes than the initial votes wins the debate. Listening to students who have changed their minds. What convinced them? Teacher explanation, refinement.
SEN recommendations When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to set rules for discussion to avoid conflicts. Make sure that hearing-impaired students can hear every sentence of the debate clearly, and sit where they can see the debaters.

b) Look into what "stages" these products go through before they reach you.

Topic, subject	Route of products
Position of exercise in teaching process	The task mainly helps with processing content.

Time required for exercise (minutes, hours, days)	10 minutes
Prior knowledge and definitions needed for the exercise	To successfully complete this task, it is important to understand the concept of supply chain and the process of preparing the chosen food.
Aim of the exercise	To make students aware of the route a product can take before it reaches the consumer.
Competences that the exercise develops	Identifying needs and wants. Recognise cause and effect
Tools needed for the exercise	paper, pencil, laptop, internet
Internet resources that students can use (for classroom and homework)	-
Recommended resources for teacher preparation	http://www.agr.unideb.hu/ebook/logisztika/elltsi_lnc.html

INSTRUCTIONS FOR THE EXERCISE

Choose two products that you often buy in the shop (e.g. chocolate, apples).

Create long and short supply chains for the same product.

MAIN STEPS TO SOLVE THE TASK

The task should be completed in pairs. Here are some possible solutions.

Long supply chain for apples

Purchasing from a shop: producer→wholesaler→retailer→customer

Short supply chain for apples

Farmers' market: producer→customer

Roadside sales: producer→customer

"Pick it yourself!": producer→customer

c) Which is the odd one out?

Topic, subject	Composting

Position of exercise in teaching process	The task mainly supports summarising and understanding.
Time required for exercise (minutes, hours, days)	5 minutes
Prior knowledge and definitions needed for the exercise	What can and what can't be composted?
Aim of the exercise	Practice, deepening of knowledge.
Competences that the exercise develops	Putting recycling into practice
Tools needed for the exercise	paper, pencil
Internet resources that students can use (for classroom and homework)	—
Recommended resources for teacher preparation	—

INSTRUCTIONS FOR THE EXERCISE

Which is the odd one out? Circle the word that does not fit in the list, and explain why.

MAIN STEPS TO SOLVE THE TASK

Proposed solution (the odd one out is underlined):

- grass clippings, LEGO figure, coffee grounds, wood shavings (LEGO figure does not decompose)
- feathers, hair, metal shavings, sawdust (metal shavings do not decompose)
- cooked food leftovers, apple core, potato peel, eggshells (composting cooked food is not recommended)
- willow bark, fruit of an apple tree, cherry blossom flower, walnut tree leaves (walnut tree leaves because of misconceptions)
- egg box, flower pot, newspaper with potato peel, paper teabag (flower pot is not compostable)

d) Guess the water footprint size of the food below.

Topic, subject	Virtual water
Position of exercise in teaching process	The task mainly supports summarising and understanding.

Time required for exercise (minutes, hours, days)	15 minutes
Prior knowledge and definitions needed for the exercise	Water footprint
Aim of the exercise	Deepen knowledge, practise internet searches.
Competences that the exercise develops	Developing conscious use of water Practise finding causes and effects
Tools needed for the exercise	paper, pencil, internet
Internet resources that students can use (for classroom and homework)	https://waterfootprint.org/media/downloads/Hoekstra-2008-WaterfootprintFood.pdf
Recommended resources for teacher preparation	—

INSTRUCTIONS FOR THE EXERCISE

Guess the water footprint size of the food below.

Number the products in ascending order according to their water demand. Which products waste the most water?

MAIN STEPS TO SOLVE THE TASK

Proposal for solving the task:

Product	Water footprint in litres	Order
1 kg beef	15,000 and 200,000	1
1 l milk (roughly 1 kg)	2,000	7
1 kg bread	1,000	8
1 kg apples	500	9
1 kg hamburgers	10,000	3
1 kg chicken breast	4,000	4
1 kg coffee	20,000	2
1 kg tea leaves	2,500	6

1 kg potatoes	200	11
1 kg rice	1,000 and 3,500	5
1 kg salad	250	20

It is important to make students aware that these figures are often only estimates and that many sources may give contradictory data. Apart from that, the point is that it takes a lot of water, often invisible to us, to make a product.

e) Working in pairs, put together a health-conscious Sunday lunch menu for a family of five.

Topic, subject	Healthy cuisine
Position of exercise in teaching process	The exercise primarily helps with processing content and practising.
Time required for exercise (minutes, hours, days)	60 minutes
Prior knowledge and definitions needed for the exercise	—
Aim of the exercise	Deepen knowledge, practise internet searches. Approximate needs and wants.
Competences that the exercise develops	Developing health-conscious behaviour
Tools needed for the exercise	paper, pencil, internet
Internet resources that students can use (for classroom and homework)	—
Recommended resources for teacher preparation	—

INSTRUCTIONS FOR THE EXERCISE

Working in pairs, put together a health-conscious Sunday lunch menu for a family of five. The budget for the main ingredients is EUR 15 – you have salt, sugar, oil, sweet paprika and pepper at home.

Make a presentation of the finished menu based on the following aspects:

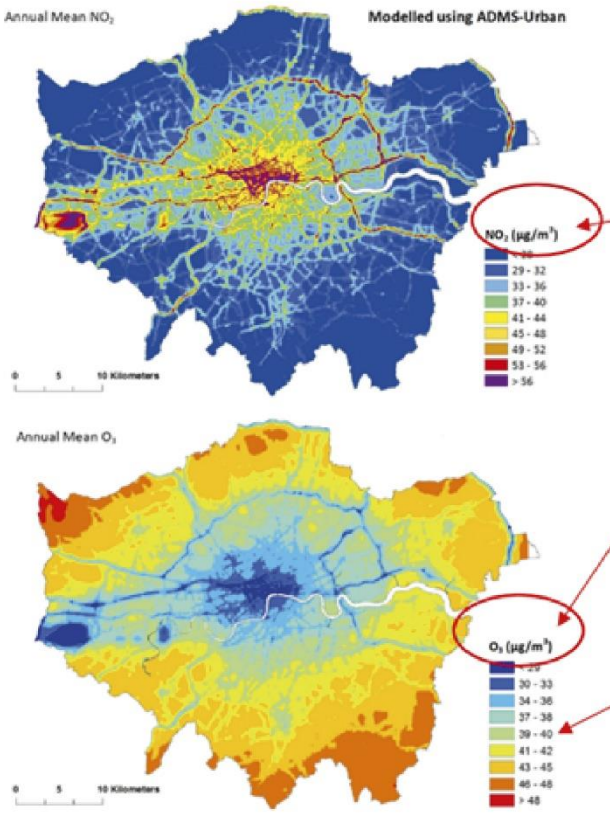
- introduction of each dish,
- health-conscious aspects of the raw materials and the food preparation techniques,

– the exact budget (what you buy, how much of it, and at what price from the EUR 15), – the exact place of purchase (near the school if possible), – the waste generated and its utilisation.
MAIN STEPS TO SOLVE THE TASK
As with so many other tasks, it is important to note that there is no right solution. The essence of the task lies in developing the algorithm for solving the task, as well in the knowledge, skills and abilities acquired when solving the task. The aim is to make students feel that it is not easy, but not impossible, to put together a health-conscious menu by: - taking into account the family's needs (soup, main course, dessert, it should contain meat and should be delicious, etc.); - harmonising with the needs of human body (energy and nutrient requirements, etc.); - meeting environmental requirements (domestic products, low waste, etc.); - meeting convenience criteria (not having to go far for ingredients, quick preparation, etc.); - using modern, healthy cooking methods (e.g. braising instead); - not exceeding the given limit. If the limit is exceeded, the students should explain where and why the extra costs were incurred. Think about how they could reduce the costs.
SEN recommendations Ensure that students with dyscalculia have access to the necessary aids when solving the exercise. Choose a partner for them who has no difficulty solving mathematical problems. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be necessary to define and refresh rules for working in pairs to avoid conflicts.

f) Analyse the air pollution map of the following city (London), and answer the questions.

Topic, subject	Air pollution
Position of exercise in teaching process	The exercise primarily helps with processing content and practising.
Time required for exercise (minutes, hours, days)	15 minutes
Prior knowledge and definitions needed for the exercise	Nitrogen dioxide, ozone
Aim of the exercise	Deepen knowledge, practise internet searches.

	Approximate needs and wants.
Competences that the exercise develops	Developing mapping and data analytics capabilities
Tools needed for the exercise	paper, pencil, internet
Internet resources that students can use (for class-room and homework)	—
Recommended resources for teacher preparation	https://aqicn.org/map/europe/ https://www.eea.europa.eu/hu/themes/air/intro http://www.levegominoseg.hu/tulajdonsag?AspxAutoDetectCook-ieSupport=1
INSTRUCTIONS FOR THE EXERCISE	
Analyse the air pollution map of the following city (London), and answer the questions.	
MAIN STEPS TO SOLVE THE TASK	
It is recommended to work in pairs to complete the task.	



Nitrogen dioxide
Ozone

The higher the value, the higher the concentration of the substance, and therefore the more polluted the area. This may be due to how frequented the area is, such as differences in the volume of vehicle traffic, or the fact that some parts may be more industrialised, or the prevailing wind direction may have an influence, etc.

To make students understand the factual evidence on the impact of the environment on health, and the links between them, is one of the key tasks of sustainability pedagogy. As science is constantly evolving and often has to revise its theses, it is important that students develop their skills and abilities rather than extend their knowledge. So in many cases, there is no one right solution. Instead, the focus should be on thinking, reasoning and searching for sources. Distinguishing between relevant, irrelevant, true, false and misleading information becomes important. One example is the contrast between the natural and the artificial. One lesson we could learn from advertising, for instance, is that natural is good, artificial is bad. In reality, however, this is not even close to being the case all the time.

SEN recommendations

Students with dyscalculia or disorders of spatial orientation may find it difficult to complete the task. Help them comprehend the air pollution map.

IV. Other ideas for working with the textbook

For more ideas, see the Digital School Health Toolkit database, available at the following link: https://efop180.antsz.hu/jatszoter/

The link above contains the developed outcome products of the lesson plans of the National Centre for Public Health's EFOP-1.8.0-VEKOP-17-2017-00001 project entitled "Professional Methodological Development of the Health Care System", which aims to "promote health-conscious choices of factors that positively influence health and significantly reduce the risk of developing diseases or delay their onset". This is recommended for colleagues who wish to explore the environment/health axis in more depth.

BUILDING A VISION

A guide to working with the Building a vision magazine

Purpose of this issue	Objectives of the framework curriculum: - Experiencing social learning and practising collaborative knowledge generation and sharing. - Assessing the advantages and disadvantages of globalisation processes in the world. - Understanding the impacts of the use of natural and social (human) resources on the environment, economy and society. - Recognising the future-building role of knowledge society in sustainable development.
Time frame	4 lessons
Links within the textbook and between subjects	This topic forges close links with all the chapters of the textbook. Connections with other subjects in grades 9-10: a) History - Social and environmental impacts of industrial revolutions. b) Chemistry - Chemical transformations - Chemical basis of life functions

	- Environmental chemistry and environmental protection c) Physics - Water and air in our environment - Preserving the integrity of our environment d) Biology - Characteristics of habitats, adaptation, biodiversity of biocenosis - Life and energy - Characteristics of habitats, adaptation, biodiversity of biocenosis - Humans and biosphere – sustainability e) Geography - Atmosphere - Hydrosphere - Local problems, global challenges, dilemmas for a sustainable future f) Visual culture - Digital imaging, social media – creating digital content, personality, Environment and sustainability - Balance between natural and built environment
Focus on skills development	The students: - with their classmates, make a forecast for the future in a selected area (e.g. family, work, environment, use of digital devices, rate of afforestation-deforestation, waste production, climate change); - identify sustainability problems at local level, cause and effect between them, and formulate proposals for solutions, individually or in groups; - examine and evaluate the options from several angles; - evaluate the group's and their own work; justify their evaluation; - know the concepts of sustainable future, green jobs, social responsibility and volunteering; - know the environmental potential of each profession and the impact of environmental protection on each profession (e.g. as an IT specialist, optimising energy consumption, as a painter, using water-based paints, and non-toxic pigments, etc.); - shape their environment in a responsible and cooperative way; - use digital tools consciously; - develop a culture of debate, formulate arguments and counter-arguments and form responsible opinions.

I. Methodological recommendations for working with the topic

To work with this issue, the teacher can choose from the recommended lesson plans and tasks according to local needs and possibilities. The magazine contains a variety of content, and offers teachers the opportunity to choose topics that have already been covered in previous lessons, or those that have previously been given little or no time or that are relevant (for example, related events currently happening in the world).

The lesson plans and exercises below are therefore only a starting point for teachers to develop their own lessons using the suggested topics. As can be seen in the workbook, some of the exercises are not directly related to the textbook articles, but primarily help to work with the given topic from several angles.

The chief methodological aspect is to support learning through personal experiences, including information gathering. We therefore consider it important that the children, or the teacher in advance, should do some research on related topics.

II. Suggested literature and resources for teacher preparation and working with material

Websites to help choose a career

https://palyaorientacio.munka.hu/kozepiskola

https://piacesprofit.hu/kkv_cegblog/milyenek-lesznek-a-jovo-munkahelyei/

https://www.profession.hu/cikk/milyen-lesz-a-jovo-munkahelye

https://blog.hvgallasborze.hu/karriertervezes/jovo-munkahelye-az-y-generacio-szemevel-nezve/

Articles on climate change

https://www.greenpeace.org/hungary/blog/4580/klimavalsag-vagy-klimakatasztrofa/

https://www.greenpeace.org/hungary/blog/4537/tehetek-en-is-a-klimavaltozas-ellen/

https://ng.24.hu/tag/klimavaltozas/
https://www.globalisfelmelegedes.info/

https://fna.hu/hir/Molegmelegebb2018

https://www.europarl.europa.eu/news/hu/headlines/priorities/klimamegallapodas-2016

Democracy and Sustainability game descriptions

a) Introducing the game
https://newshores.crs.org.pl/hu/#celjaink

b) E-learning material on the game
https://newshores.crs.org.pl/wp-content/uploads/2018/11/Regisztr%C3%A1ci%C3%B3-a-New-Shores-A-demokr%C3%A1cia-j%C3%A1t%C3%A9ka-e-learning-fel%C3%BClet%C3%A9re.pdf

c) Moderator tutorial video
https://www.youtube.com/watch?v=8E95dJaeLtc&t=121s&ab_channel=CentreforSystemsSolutions

Conscious Customer website: https://tudatosvasarlo.hu/

How did wolves change the rivers?

https://www.ujakropolisz.hu/cikk/hogyan-valtoztattak-meg-farkasok-folyokat

How did wolves change the direction of the rivers?

https://www.youtube.com/watch?v=KTowuvk2f9Y&ab_channel=sevaster1

Wolves in Hungary

https://www.youtube.com/watch?v=dcUKWEckofU&ab_channel=M5

III. RECOMMENDATIONS FOR LESSON PLANS

The material can be approached from various perspectives, and teachers are encouraged to develop the final lessons around areas of particular interest to students that have been focused on so far.

We suggest working on four possible focal areas, with the understanding that developing the topics based on the main focal areas should be done with the educational objectives of the whole topic in mind. The different focal areas partly overlap, and a lesson plan is possible that is presented along several focal areas. Teachers are encouraged to group topics and prepare lessons according to their individual perspectives.

The proposed focal areas are:

I. Personal responsibility and vision focus:

This focus is on the individual, the student's personal vision, taking sustainability into account. Topics to be covered include: work and employment in the present and the future, civic activism and volunteering, and green career paths.

II. Sustainable future and corporate social responsibility focus

With this focus, students can turn to sustainability issues from a global perspective. Topics to be covered: Rethinking future sustainability issues, sustainable vs. unsustainable future, and corporate social responsibility

III. Systems thinking focus

This focus is on developing systems thinking skills to better understand the background and interconnectedness of global problems. Topics to be covered: System dynamics of climate change, dynamics in the ecosystem, and dynamics in democracy

IV. Ecological problems focus

This focus is specifically problem-oriented and encourages students to think about solutions. Topics to be covered: Climate change and systems thinking, Water issues, Green energy, designing a local green map

Below are the 4-lesson plans for the topics grouped by the focal areas:

I. Personal responsibility and vision focus

Lesson 1

Topic of the lesson: Work and employment in the present and the future

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to foster critical thinking, develop empathy and a sense of personal vision.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Working from home – from the employee's perspective	Individual reading of the chapter "Wearing pyjamas at work" in the textbook	individual work	textbook
5 minutes	Working from home – from the employee's perspective	Joint discussion of the textbook article: - What do you think are the pros and cons of working from home from the employee's point of view?	class discussion, brainstorming	board, chalk / board marker
10 minutes	Working from home – from the employer's perspective	Overview of the employer perspective: In small groups of 3-4 people, students should list what the employer might think. What pros and cons do they see in teleworking? The groups should make a short presentation of the collected ideas (it is enough to say only what has not yet been put forward).	small-group work, presentation to everyone	workbook exercise 1, pen, paper, board, chalk, board marker
20 minutes	Difficulties working from home	Working from home – what's it like? Conduct the *Workplace in the present and the future* role play	role play / human sculpture game (detailed instructions below)	-
5 minutes	Summary, conclusion	Form your own opinion, share it on a live scale.	Opinion line	"Yes" and "No" signs

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		Put a yes sign at one end of the room, and a no sign at the other. Tell the students these are the two extreme values of a scale. In answer to the question "Would you prefer to work at home?", everyone should stand between the two ends as they feel at that moment. Some students can be asked for their opinion.		

SEN recommendations

Reading and interpreting the article *Wearing pyjamas at work* independently can be a problem for dyslexic learners, who are unlikely to be able to read such a long text in 5 minutes. It is recommended to read out the article to them in pairs, or assign it as homework in the previous lesson. The students concerned could also receive the article as an audio file and listen to it on their phone while following the text in the textbook.

When forming groups, it is advisable to use a guided format for students with behavioural problems or autism spectrum disorder, and place them in a suitably supportive group.

When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it might be necessary to define and refresh the rules of group work and role play to avoid conflicts. Pay attention to the positioning of hearing impaired students, it is important that they can see others' mouths and hear well what they say. Students with speech impairments or any kind of speech disorder should only participate in role-playing voluntarily. Don't give them a role against their will. Ask their groups not to do so either. Students with reduced mobility and visually impaired students should participate in role-playing taking their disability into account.

Lesson 2

Topic of the lesson: Activism and volunteering

Time required: 1 lesson (+ 1 hour of homework)

Pedagogical objective: The aim of the activity is to promote solution-focused thinking, reflect on their community solution proposals, as well as develop critical thinking and their personal vision and career image.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Engaging the students	Exercise 11 in the workbook assigned in advance and discussed.	discussion at class level	Workbook exercise 11: Mapping local sustainability-related organisations as homework
15 minutes	Discussion about activists	Read and discuss the article *Dare to dream big!* in the textbook. How much do you agree, and with whom?	discussion at class level	textbook
10 minutes	Discussion about volunteering	Summarise and discuss the article *One swallow doesn't make a summer* in the textbook.	a) short presentation, discussion or b) small-group work, collecting questions and discussion	textbook
5 minutes	Who does what?	Working individually: exercise 9 in the workbook	Joint discussion	workbook
5 minutes	What would you do? *or* Who does what?	Discussing exercise 8 in the workbook, solving the exercise as an extra-curricular (homework) task.	working individually, homework assignments working individually or in pairs	workbook
SEN recommendations				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
Reading and interpreting the articles independently can be a problem for dyslexic pupils or those with reading disabilities. It is advised to read and discuss the article in small groups with cooperative learning techniques, making sure that dyslexic pupils read texts that are shorter and easier to understand. For students with dysgraphia or dysorthography, it is recommended to solve exercise 9 individually at home. All students with special educational needs should be given the opportunity to write the motivation letter for exercise 8 electronically.				

Lessons 3-4

Topic of the lesson: Green jobs

Time required: 2 lessons

Pedagogical objective: The aim of the activity is to develop critical thinking and their personal vision and career image.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
40 + 45 minutes	Introducing green jobs	After completing exercise 10 in the workbook, introduce the different jobs. Based on the textbook list, the teacher can assign different professions to the students/small groups of students to interview people with such professions OR to find people with similar professions and interview them. Make a poster about the profession based on the interview.	interview/poster presentations to the class	
5 minutes	Summary: which would you choose?	Hang up the presentation posters in different parts of the classroom. Each student should stand by the poster of what would be their first choice if they were to choose one of these professions. Ask the students why they chose it.	discussion	

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
SEN recommendations For pupils with learning or attention difficulties, memory problems or hearing impairments, it is recommended to continue the digital glossary they started in previous lessons, including, for example, green jobs, green map, volunteering, etc. This can be based on the glossary at the end of the textbook, but the descriptions there may not be appropriate for every learner's language skills. You may need shorter, simpler explanations that do not contain foreign terms. All students with special educational needs should be given the opportunity to write the interview part of exercise 10 or to present it in an audio file.				

II. Sustainable future and corporate social responsibility focus

Lesson 1

Topic of the lesson: Rethinking future sustainability issues

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to foster critical thinking, systems thinking and solution-focused thinking.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Identify the biggest problems in the world today. First everyone should write down the problems, then they read them out. The teacher should write them on the board or ask a student to do so by grouping the similar ones together.	brainstorming	board, chalk / board marker
5 minutes	Forming an individual opinion	Thinking through the challenges of the future individually, completing the related exercises 2/a and 2/b in the workbook.	individual work	workbook
5 minutes	Reaching a common standpoint	Jointly identify the three most important challenges.	voting on the list or in small groups	board, chalk / board marker –

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		Each student should say which two they think are the most important and draw a line next to the ones they have chosen. Or the students can go to the board and draw 2 lines, or the teacher hands out sticky dots in advance and they stick them next to the one they have chosen.		possibly sticky dots for voting
20 minutes	Proposing solutions	Each group is given a challenge with a high vote, and in small groups they complete task 2/d of the workbook and make a poster. (The exercise can also be done by working individually, doing individual research.)	small-group work	wrapping paper or flipchart paper or A3 paper for posters, coloured felt-tip pens, writing utensils
10 minutes	Reviewing proposed solutions	View and discuss posters	joint discussion	
SEN recommendations When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it might be necessary to define and refresh the rules of group work to avoid conflicts. When making posters, rely on their creativity and visual imagination. Provide spelling support for students with dysgraphia and dysorthography when making the poster. Do not assess writing and spelling in workbook exercises. Provide help (e.g. answer key) to correct the mistakes.				

Lessons 2-3

Topic of the lesson: Sustainable or unsustainable future?

Time required: 2 lessons

Pedagogical objective: The aim of the activity is to foster critical thinking and their personal vision and career image.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
45 minutes	Watching a film together	Screen parts of the following films: - *The Matrix* - *The Hunger Games* - *Blade Runner* - *Mad Max* - *The Maze Runner, or* - *La belle Verte.*	frontal	projector, computer, film
5 minutes	Engaging the students	What do the films say the future world will look like?	joint discussion	
25 minutes	Envisioning the future	In small groups, identify different themes to explore what they will look like in 30 years' time: – transport – buildings – clothing, etc. The students should make a poster about it and show it to the others.	small-group work, followed by a presentation	wrapping paper or flipchart paper or A3 paper for posters, coloured felt-tip pens, writing utensils
10 minutes	Is it sustainable?	The posters are given to another group. The other small group has the task of thinking about what is sustainable and what is not from this vision.	small-group work, followed by a presentation	
5 minutes	Summary	Discuss what will be sustainable and what is probably not.	discussion	

Lesson 4

Topic of the lesson: Corporate social responsibility

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to foster critical thinking, promote solution-focused thinking, reflect on their community solution proposals, and develop their personal vision and career image.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Understanding the concept of corporate social responsibility.	Presentation of the related article in the textbook, evaluation of the concept	large-group task	textbook
20 minutes	What can a large company do for the community and the environment?	Search online and review the Corporate Social Responsibility (CSR) or sustainability reports of specific large companies. Then think through how the large company is helping or harming the community. Option: assign the internet search and processing as homework in the previous lesson, leaving more time and opportunity for discussion in class	small-group work	smart devices with internet
10 minutes	Harmful or useful?	Based on small-group work, a class discussion on whether large companies do more harm than good to the community and sustainability, and what can be done about them.	large-group task	
5 minutes	Conscious shopping	How can we be more conscious consumers?	Class discussion	

III. Systems thinking

Lesson 1

Topic of the lesson: Climate change and systems thinking

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to experience social learning and practise collaborative knowledge generation and sharing, assess the advantages and disadvantages of globalisation and universalism in the world, and learn about the impacts of the use of tangible and intangible resources on the environment, economy and society.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
15 minutes	Discussing the article *Where is the world going?*	Read the article individually. What is changing? What is increasing and what is decreasing? While reading the article, students should underline the factors which are changing in some way in the process of climate change. They should collect at least 10 such factors, and write down how they are changing. They can also write down factors that do not appear in the article, but they have read/heard about them in the previous chapters of the textbook or elsewhere. For example: - Annual average temperatures have been rising for years. - The ice cover in Greenland is shrinking. - The dark water surface is growing. - Forests are shrinking. Collect about 10-15 of these variables together/in small groups.	working individually (completing exercises 3/a and 3/b in the workbook) small-group work or joint discussion	textbook, workbook, Post-it notes felt-tip pens

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Finding correlations	What impacts on what? In the next step, they should examine how the factors (variables) above affect each other (if they do). First, look at direct connections. Find at least 10 correlations between the variables above. For example: - Annual average temperatures are rising, which leads to the ice melting and therefore shrinks the ice cover. - The melting of the ice cover increases the dark water surface. - The dark water surface absorbs the sun's rays (as opposed to the ice cover reflecting them back), and therefore the temperature rises.	climate network (description below)	string
10 minutes	Finding the direction of correlations	Indicate what affects each other, and how, as described in the workbook. Preparation of a system dynamics diagram.	whole class	
8 minutes	Finding traps	Search for the self-reinforcing processes ("vicious circle") in the model that contribute to the intensification of climate change.	small group or whole class	
2 minutes	Summary	Summarise the process: what steps were taken to find these self-reinforcing vicious circles. Do we experience such vicious circles in our lives? (e.g. I don't move – I gain weight – it's harder to move – I don't move)	frontal	
SEN recommendations Reading and interpreting the article *Where is the world going?* independently can be a problem for dyslexic learners, who are unlikely to be able to read such a long text in 5 minutes. It is recommended to read out the article to them in pairs, or assign it as homework in the previous lesson. The students concerned could also receive the article as an audio file and listen to it on their phone while following the text in the textbook.				

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it might be necessary to define and refresh the rules of group work and the spider web exercise (finding connections, depicting with string) to avoid conflicts. Make sure to involve students with reduced mobility in this exercise. Do not assess writing and spelling in workbook exercises for students with dysgraphia and dysorthography. Provide help (e.g. answer key) to correct the mistakes.				

Lesson 2

Topic of the lesson: Ecosystem and systems thinking

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to foster critical thinking, systems thinking and develop a positive vision of nature.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Engaging students in the topic. Ask whether they have heard that wolves are returning to Hungary. What do they think?	conversation	
5 minutes	How did wolves change the direction of the river?	What happens to the ecosystem when large carnivores return? View the related film by choosing from the suggestions below: - How did wolves change the direction of the rivers? (https://www.youtube.com/watch?v=KTowuvk2f9Y&ab_channel=sevaster1) - Wolves in Hungary (https://www.youtube.com/watch?v=dcUKWEckofU&ab_channel=M5)	frontal, film viewing	projector computer or smartboard internet access
15 minutes	Knowledge processing	Based on the film clip and the accompanying article (How did wolves change the rivers? https://www.ujakropolisz.hu/cikk/hogyan-valtoztattak-meg-farkasok-folyokat) create a	small-group work and presentation	internet access

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		flowchart showing how the increase in wolf numbers led to spatial changes.		
15 minutes	Debate – is the presence of wolves good or bad for the community?	In groups, students collect the different actors' perspectives on why the arrival of wolves is good or bad for them: - hunters - farmers - conservationists and nature - residents A debate between students representing the different actors' points of view.	small-group work	
5 minutes	Summary	Opinion poll: how good do you think it is that wolves are slowly returning to Hungary?	opinion line	
SEN recommendations Visually impaired students may have difficulty watching the film and reading the subtitles, while pupils with dyslexia or other reading difficulties may find it hard to read the subtitles. They should watch the film in pairs with a student who reads well and reads out the subtitles, or they should have the opportunity to view the film the day before. For a visually impaired student, try to explain not only the subtitles but also the visuals. When mainstream teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it may be important to explain and refresh the rules for discussion and group exercises.				

Lessons 3-4

Topic of the lesson: Democracy and sustainability

Time required: 2 lessons

Pedagogical objective: The aim of the activity is to foster critical thinking, systems thinking, collaboration and solution-focused thinking.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
90 minutes	New shores simulation game	Play the game and discuss the experience.	simulation game (details in the task description)	smart device with internet
SEN recommendations It is essential to clarify the framework and rules of the game, even if it takes place at school or at home. It is necessary to define how pupils with special educational needs can be involved in the game. It is a good idea to ask them about this and take their requests into account. It may be difficult for visually impaired pupils to participate in the game, depending on the severity of their impairment, so it is advisable for them to take part in cooperation with a classmate with good eyesight.				

IV. Ecological problems focus

Lesson 1

Topic of the lesson: Climate change and systems thinking

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to experience social learning and practise collaborative knowledge generation and sharing, assess the advantages and disadvantages of globalisation and universalism in the world, and learn about the impacts of the use of natural and social (human) resources on the environment, economy and society.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
15 minutes	Discussing the article *Where is the world going?*	Read the article individually. What is changing? What is increasing and what is decreasing? While reading the article, students should underline the factors which are changing in some way in the process of climate change. They should collect at least 10 such factors, and write down how they are changing. They can also write down factors that do not appear in the article, but they have read/heard about them in the previous chapters of the textbook or elsewhere. For example: - Annual average temperatures have been rising for years. - The ice cover in Greenland is shrinking. - The dark water surface is growing. - Forests are shrinking. Collect about 10-15 of these variables together/in small groups.	working individually (completing exercises 3/a and 3/b in the workbook) small-group work or joint discussion	textbook, workbook, Post-it notes felt-tip pens

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
10 minutes	Finding correlations	What impacts on what? In the next step, they should examine how the factors (variables) above affect each other (if they do). First, look at direct connections. Find at least 10 correlations between the variables above. For example: - Annual average temperatures are rising, which leads to the ice melting and therefore shrinks the ice cover. - The melting of the ice cover increases the dark water surface. The dark water surface absorbs the sun's rays (as opposed to the ice cover reflecting them back), and therefore the temperature rises.	climate network (description below)	string
10 minutes	Finding the direction of correlations	Indicate what affects each other, and how, as described in the workbook. Preparation of a system dynamics diagram.	whole class	
8 minutes	Finding traps	Search for the self-reinforcing ("vicious circle") processes in the model that contribute to the intensification of climate change.	small group or whole class	
2 minutes	Summary	Summarise the process: what steps were taken to find these self-reinforcing vicious circles. Do we experience such vicious circles in our lives? (e.g. I don't move – I gain weight – it's harder to move – I don't move)	frontal	

Lesson 2

Topic of the lesson: Water problems

Time required: 1 lesson (+ 2 hours of homework)

Pedagogical objective: The aim of the activity is to promote solution-focused thinking and develop proposals for solutions.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Review of homework assignments 4/a, 4/b and 4/c.	joint discussion	Complete exercises 4/a, 4/b and 4/c of the workbook
5 minutes	Problems of water scarcity	Gathering own experiences	exercise (detailed description below)	
5 minutes	Collecting own ideas for water solutions	Brainstorming: What can we do to reduce water consumption?	joint discussion	board, chalk / board marker
15 minutes	Planning solutions	Choosing from the ideas above, the small groups develop an action plan according to exercise 4/e in the workbook and illustrate it.	small-group work	wrapping paper or flipchart paper or A3 paper for posters, coloured felt-tip pens, writing utensils
10 minutes	Presentation of solution plans	The small groups present their solution plans, and others can ask questions about them. (The plans can be presented one after the other, but if there are a lot of groups, you can display them in an "exhibition" where the children go around and look at each other's work.)	presentation for everyone	
5 minutes	Summary	Possible follow-up: the class should choose one of the action plans to implement together in a project.	frontal	small notes for voting

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
		Decide in a collective vote which plan you choose: everyone has three votes and can vote for the action plan they like. The plan with the most votes is chosen.		

SEN recommendations

Students with dyscalculia may find it difficult to do their homework. Ask them to work in pairs with a class-mate chosen together.

Making posters can be difficult for visually impaired students. Make sure their ideas are also on the poster.

When working in a group, make sure that the hearing impaired students can hear the other group members. Provide enough space so that their louder conversations do not disturb other groups.

When also teaching pupils with behavioural problems, hyperactivity, attention difficulties or autism spectrum disorder, it might be necessary to define and refresh the rules of group work to avoid conflicts. When making posters, rely on their creativity and visual imagination.

Provide spelling support for students with dysgraphia and dysorthography when making the poster. Do not assess writing and spelling in workbook exercises. Provide help (e.g. answer key) to correct the mistakes.

Lesson 3

Topic of the lesson: Green energy

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to promote solution-focused thinking, reflect on their own solution proposals and stimulate critical thinking.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	What energy sources exist?		
15 minutes	Energy sources	Exercise 7 point (b) in the work-book: assign one renewable or non-renewable energy source to each small group. The groups' task is to gather as many arguments for and against as possible.	Small-group research	devices with in-ternet access for all groups wrapping paper or flipchart pa-per or A3 paper for posters, col-oured felt-tip pens, writing utensils
5 minutes	Consultation	The small groups working on the same issue collate their lists and choose representatives for a joint debate.	large-group discussion	
15 minutes	Debate	The representatives of the small groups debate which energy source would be the most appro-priate for the domestic situation. Other students can "take the floor" from the representatives by standing behind them and put-ting their hands on their shoul-ders or by swapping places.	aquarium exercise	
5 minutes	Summary	Poll: if you had HUF 500 million, which type of energy production would you invest in?	frontal game	

Lesson 4

Topic of the lesson: Green map

Time required: 1 lesson

Pedagogical objective: The aim of the activity is to promote solution-focused thinking, reflect on their own solution proposals and stimulate critical thinking.

Time	Block name, short description	Purpose of block, tasks to be completed	Working style, methods	Tools needed, preliminary preparation
5 minutes	Engaging the students	Look around the classroom. What promotes sustainability? What doesn't?	Class discussion	
35 minutes	Green map	Exercise 6 of the workbook	Small-group or class discussion	wrapping paper or flipchart paper or A3 paper for posters, coloured felt-tip pens, writing utensils a copy of the town's map for each student
5 minutes	Summary, reflection	Which locations have you visited so far?	working individually or discussion in pairs	map

IV. Recommendations and suggestions for the exercises in the textbook and work-book

a) Workplace in the present and the future – Role play

Topic, subject	Career guidance
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	20 minutes
Prior knowledge and definitions needed for the exercise	None.
Aim of the exercise	Gathering own experiences.
Competences that the exercise develops	"Examines and evaluates the options from several angles."
Tools needed for the exercise	Situation descriptions
Internet resources that students can use (for classroom and homework)	Website to help choose a career: https://palyaorientacio.munka.hu/kozepiskola
Recommended resources for teacher preparation	Website to help choose a career: https://palyaorientacio.munka.hu/kozepiskola Articles describing the workplace of the future: https://piacesprofit.hu/kkv_cegblog/milyenek-lesznek-a-jovo-munkahelyei/ https://www.profession.hu/cikk/milyen-lesz-a-jovo-munkahelye https://blog.hvgallasborze.hu/karriertervezes/jovo-munkahelye-az-y-generacio-szemevel-nezve/

MAIN STEPS TO SOLVE THE TASK

Time	Activity	Methods	Tools	Notes
5 minutes	Form small groups (of 4-5 people) Hand out the descriptions of the situations	group formation	*Situation descriptions* at the end of the draft	Variation: enterprising students can come out directly and

Time	Activity	Methods	Tools	Notes
				act out a chosen/random situation.
5 minutes	The small groups think about how they would show the situation in a scene lasting up to 2 minutes or in a sculpture.	role play / human sculpture game	Situation descriptions	
10 minutes	Presentation of completed scenes / sculptures	role-playing (aquarium situation: a few make the presentation, others watch) saying thoughts out loud (After the scene, the actors and the audience can be asked what each character might be feeling.)	Situation descriptions	

Situation descriptions:

a) The employer discovers that an employee who works from home has produced a much lower performance over the past month. In an online meeting, he tries to find out why.
b) The employee, a mother, works from home and her children are at home because they are a bit ill. She's in an online meeting with her boss, and her kids are distracting her.
c) The power goes out and the internet goes down at home, yet in half an hour an online meeting is to start.
d) Management discusses how to make sure that the new employee gets to know the colleagues who otherwise work mainly from home.

b) Climate network

Topic, subject	Climate change and systems thinking
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	10 minutes
Prior knowledge and definitions needed for the exercise	radiation absorption, reflection, continents, climates

Aim of the exercise	Personal experience of the relationships between different variables and understanding how complex systems work.
Competences that the exercise develops	- Identifies sustainability problems at local level, the cause and effect between them, and formulates proposals for solutions, individually or in groups. - Examines and evaluates the options from several angles.
Tools needed for the exercise	a ball of string, Post-its, felt-tip pens
Internet resources that students can use (for classroom and homework)	https://www.greenpeace.org/hungary/blog/4580/klimavalsag-vagy-klimakatasztrofa/ https://www.greenpeace.org/hungary/blog/4537/tehetek-en-is-a-klimavaltozas-ellen/ https://ng.24.hu/tag/klimavaltozas/
Recommended resources for teacher preparation	https://www.globalisfelmelegedes.info/ https://fna.hu/hir/Molegmelegebb2018 https://www.europarl.europa.eu/news/hu/headlines/priorities/klimamegallapodas-2016

INSTRUCTIONS FOR THE EXERCISE

As part of the previous exercise, write each variable on a Post-it note. Each student (or, in the case of a larger group, the same number of students as the number of notes) is given a Post-it note to pin on themselves.

They should stand in a circle.

One student is given the string, and their task (after wrapping the end of the string around their finger) is to throw the string to a student who has a note with a variable that is affected by their own variable (task c, step 2). So the thread between the two people is "stretched", indicating the connection.
If necessary, make corrections (e.g. if there is no direct effect between the factors). Here you can discuss the different connections in more depth.
It is recommended to present the correlation on the board according to the rest of the exercise (exercise c, steps 3-4).
The next student throws the string on, depicting another connection, and so on, within the time available. Sometimes the string between two students can "fly" in either direction, as both factors interact.
Summary: Look at the connections on the board.

c) Democracy – game

Topic, subject	Democracy and sustainability
Position of exercise in teaching process	The task mainly helps with processing content.
Time required for exercise (minutes, hours, days)	90 minutes
Prior knowledge and definitions needed for the exercise	smart device use
Aim of the exercise	Understanding the impact of community decisions on nature, supporting joint decisions
Competences that the exercise develops	- Identifies sustainability problems at local level, the cause and effect between them, and formulates proposals for solutions, individually or in groups. - Assesses the facts from several angles - Examines and evaluates the options from several angles. - Evaluates group and own work; justifies their evaluation. - Shapes their environment in a responsible and cooperative way. - In their view of the world, it shows a people focus, and responsibility for the environment, which cannot be shirked. - Conscious use of digital tools.
Tools needed for the exercise	tablet or computer per participant
Internet resources that students can use (for classroom and homework)	—
Recommended resources for teacher preparation	Introducing the game https://newshores.crs.org.pl/hu/#celjaink https://newshores.crs.org.pl/wp-content/uploads/2018/11/Regisztr%C3%A1ci%C3%B3-a-New-Shores-A-demokr%C3%A1cia-j%C3%A1t%C3%A9ka-e-learning-fel%C3%BClet%C3%A9re.pdf Moderator tutorial video https://www.youtube.com/watch?v=8E95dJa-eLtc&t=121s&ab_channel=CentreforSystemsSolutions
INSTRUCTIONS FOR THE EXERCISE	

The game is a multi-award-winning online simulation game with detailed instructions on how to play that can be found at the link provided. Play remotely (from home) or in the classroom with digital devices. The exercise involves several rounds of play. There is always an "active round", where students individually (or in pairs or triples) make decisions about construction or development using their own (or their group's) resources. This is followed by a "discussion round", where participants can see (anonymously) the decisions of others and the combined impact of all the decisions on their environment (and their life). It is then even possible to conclude joint agreements. This is followed by further rounds. There are usually about 10-12 rounds, which can be adjusted by the game leader.

d) Water problems

Topic, subject	Water efficiency
Position of exercise in teaching process	The exercise helps engage students.
Time required for exercise (minutes, hours, days)	10 minutes
Prior knowledge and definitions needed for the exercise	None.
Aim of the exercise	Own experience of what it is like not to have easy access to water.
Competences that the exercise develops	- Shapes their environment in a responsible and cooperative way. - Examines and evaluates the options from several angles. - Identifies sustainability problems at local level, the cause and effect between them, and formulates proposals for solutions, individually or in groups.
Tools needed for the exercise	jug of water
Internet resources that students can use (for classroom and homework)	—
Recommended resources for teacher preparation	—
INSTRUCTIONS FOR THE EXERCISE	
Step 1: Visualisation exercise: (Students should close their eyes while the teacher tells the story.)	

"Imagine you live in an area where there is a temporary water shortage. There is a very serious burst pipe that simply cannot be repaired quickly for financial reasons, so for weeks the whole village has to walk to an alternative water source, the well, which is 5 kilometres away. The water needs to be boiled at home before drinking, to ensure it is safe."

Step 2:

Put a big jug of water on the teacher's desk. Students should walk to the jug with a full backpack. Don't talk about who leaves when. They should fill their bottles and glasses with water, then go back to their seats.

Reflection

- Who got how much water?
- How did it feel to go and queue for water with a heavy load on their back?
- What were their thoughts on the exercise?
- What would it be like to live in a world where water shortages are a daily challenge?

ANNEXES

Annex 1

Pupils with special educational needs in mainstream education

1. Some definitions

1.1. What does special educational needs mean?

Pupil with special educational needs: according to Section 4 (25) of Act CXC of 2011 on National Public Education, "a pupil requiring special treatment is someone who, according to the opinion of the expert committee, has a motor, sensory (visual, auditory), intellectual or speech disability, or, in the case of a combination of several disabilities, a cumulative disability, autism spectrum disorder or other mental development disorder (severe learning, attention or behavioural disorder)".

1.2. Categories of special educational needs[2]

Hearing impediments: umbrella term. Hearing impaired people are those who are deaf or have hearing loss or cochlear implants (CI). A cochlear implant is a hearing aid implanted in the inner ear. The development of language communication (speaking comprehension, reading comprehension, vocabulary, understanding and use of language structures, phonetic speech, etc.) of a hearing impaired student may differ from normal due to the lack or loss of hearing, and as a consequence, the development of cognitive activity and overall personality may be different. The student's language communication needs intensive development because its level does not necessarily correlate with their age and hearing condition.

- Deaf pupils have severe hearing loss: their hearing loss in the frequency range of speech sounds is greater than 90 dB.
- Students with hearing loss:
    - for mild hearing loss, the hearing loss measured in the frequency range of speech sounds is between 30 and 45 dB;
    - for moderate hearing loss, the hearing loss measured in the frequency range of speech sounds is between 46 and 65 dB;
    - for severe hearing loss, the hearing loss measured in the frequency range of speech sounds is between 66 and 90 dB;

[2] Literal definitions from the Guidelines for the education of pupils with special educational needs. https://www.oktatas.hu/kozneveles/kerettantervek/2020_nat/iranyelvek_alapprogramok (downloaded on 26 January 2021)

- Hearing-impaired students who have restored their hearing surgically (e.g. cochlear implant) – after hearing correction surgery on one or both sides – can be deemed as having physically near-intact hearing.
- The "dysphasia type" of learning disability associated with hearing impairment is a specific form of cumulative disability. Its complex symptoms are manifested by more severe language and speech development disabilities, and psychomotor features suggestive of dyspraxia and sensorimotor integration disorder. Specific language impairment and the accompanying psychomotor symptoms are present in a variety of forms with a specific composition in addition to mild to severe hearing impairment.

Visual impairment: a condition resulting from damage to the visual organ (eye, optic nerve and/or cortical areas/areas under the cerebral cortex responsible for vision), which alters the pupil's cognitive function, adaptability and personality development.

From a special education point of view, pupils are visually impaired if their visual performance is between a visual acuity of 0 and 0.3 compared to intact vision (visual acuity: 1), with two eyes and corrected (glasses). A visually impaired pupil is also a pupil with a central field of vision of 20° or less.

Including:

- blind pupils who have no vision at all (visual acuity: 0);
- pupils with low vision are those with minimal vision (visual acuity: light perception – 0.1);
- partially sighted pupils whose daily living is severely limited by reduced visual performance (visual acuity: 0.1–0.3).

Other mental developmental disorders*:* an umbrella term used in the Public Education Act, a category of eligibility for special educational needs (SEN). This category includes pupils with severe learning, attention or behavioural disorders, who, due to the differing development of cognitive and emotional/social abilities in the area of school performance and behaviour control, and the cumulative occurrence of the developed disorders, require increased pedagogical and psychological support, as well as special education assistance, taking their individual characteristics into account.

The category includes several different diagnoses, partly neurodevelopmental disorders and partly other behavioural control disorders.

- A (specific) learning disability is a multifactorial neurodevelopmental disorder (e.g. dyslexia, dysgraphia, dyscalculia or a combination of these), which causes serious difficulties in learning and successful school progress despite average or above-average intellectual abilities and appropriate educational conditions adapted to needs.
    - Reading disability (dyslexia) is a specific learning disorder of neurobiological origin, characterised by difficulties in learning to read and write, poor word

recognition, inaccurate and slow reading, most often associated with spelling disorders.
    - Spelling disorder (dysorthography) rarely occurs on its own.
    - Writing disorder (dysgraphia) often occurs without a reading disorder. Secondary consequences may include difficulties in reading comprehension and less reading experience may hinder the development of vocabulary and background knowledge.
    - With dyscalculia, there is a significant delay in the development of numerical knowledge, numerical cognition, number and operation concepts, basic operations and basic functions (spatial-visual system, central executive, working memory, speech and language, thinking functions) in relation to intellectual performance, age (grade level). Consequently, it can be difficult to master advanced mathematical concepts, to acquire and apply mathematical knowledge and to solve problems in everyday situations.
- Increasingly used in everyday language, the term ADHD is an acronym for Attention Deficit Hyperactivity Disorder, which is characterised by
    - attention deficit and/or
    - hyperactivity and impulsivity.
    - The two subtypes can occur independently or in combination.
- Behavioural disorder is also a SEN condition listed under the category of other mental disorders. An umbrella term used to describe
    - impulse control disorder (aggressive, destructive verbal and behavioural outbursts directed at persons and/or objects, property) and
    - disruptive (irritated, argumentative, troublesome),
    - dissocial (norm-breaking, aggressive, disruptive) behavioural disorders.

In the case of reduced mobility, congenital or acquired damage to the musculoskeletal system permanently impairs the functional abilities of the body and the activity of the individual; it may cause a handicap and a restricted lifestyle. Its forms:

- limb reduction malformations or acquired limb deficits,
- pathologies causing flaccid paralysis,
- movement disorders caused by early brain damage,
- orthopaedic and other conditions.

Autism spectrum disorders are the result of very early, most likely congenital damage to the nervous system and a combination of genetic, other biological and environmental factors. At the core of autism spectrum disorders is a qualitative impairment in social behaviour, communication and flexible behavioural organisation, which manifests itself in characteristic behavioural symptoms. Students with autism spectrum disorder are mainly characterised by a specific deficit in thinking skills in the area of reciprocal

social behavioural skills, impaired reciprocal communication compared to the level of speech, a qualitative impairment in the ability to organise and express flexible behaviour, and an uneven skills profile.

Speech impaired students are all students who have a severe developmental or acquired disorder in the organisation of receptive processes of speech and/or language (speech processing, comprehension, understanding) or expressive processes (speech and language expression, production). This disorder presents in different clinical pictures and may also vary in character according to age. Due to the severe impairment in verbal communication and the atypical development of verbal learning processes, such pupils are handicapped in terms of social integration.

Speech disorders:

- disorders of voice production,
- resonance disorders (hypernasality, hyponasality),
- speech fluency problems (stuttering, babbling),
- articulation disorders (speech sound errors),
- speech movement disorders (verbal dyspraxia).

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2. Recommended differentiation process

The recommendations in the teacher's handbook are general, and presented in relation to an imaginary secondary school pupil with special educational needs. So they are not always suitable for all students with special educational needs. Make sure you get to know the SEN pupils in your class before you think about the teaching material and start to differentiate the material or organise learning. Talk to the form teacher and study the expert opinions on the pupils, ask the special education teacher for help.

By reading the expert opinion, the special education teacher gets an impression of the pupil, which can help you later with differentiated lesson planning. This will give you some general knowledge about the student(s) so you can start planning the lesson. Be sure to take the information about the student(s) into account when planning the next lesson. Ask the students for advice, as they have a lot of previous experience with their own learning style and methods. This can also help you get to know them and provide an opportunity for tailored development based on mutual trust.

Emphasise and make all pupils feel that we view differences between pupils as natural and accept them. That is why we should not only differentiate for the SEN student but also for the diversity of students, which is different in each case. We should pay attention to their strengths and positive qualities and develop students by strengthening them.

3. What to look out for when reading the expert opinion, what helps you to plan the differentiation?

The content of the expert opinion is defined in *EMMI Decree 15/2013 (II.26) regulating the operation of specialised pedagogical institutions*. The expert opinion should contain several mandatory elements, which should be read by all teachers working with the pupil. What you should pay specific attention to: the examination facts, findings and recommendations, and the ICD code. These include what difficulties SEN pupils have and how these can be compensated for and improved.

The recommendations section includes, among other things

- the proposed number of hours per week for rehabilitation exercises;
- the description of the therapeutic procedures and the qualifications of the teacher providing them;
- recommendations on the organisation of learning, methodology, pedagogical procedures, pedagogical evaluation, rating (assessment, assessment exemptions, suggesting other options for the benefit of the student from the range of entitlements set out in the National Education Act, pedagogical assistance, individual pedagogical planning);
- and detailed development proposals.

4. Recommendations for pupils with behavioural problems, attention difficulties (other mental disorders) in mainstream education

Those with integration difficulties, behavioural problems and attention difficulties are pupils of sound intellect, so there is no need to differentiate the amount of material in their education. (If there are other partial disabilities, it is possible, according to the expert opinion, that differentiated learning of the teaching material may be necessary.) However, it might be needed to differentiate the way how the material is taught, conveyed and learnt. It is very important to be aware that there can be a big difference between the educational achievement and behaviour of students with behavioural difficulties or problems. So it is advisable to assess these two areas separately, and not to include undesirable behaviour in the subject assessment, as this can reduce motivation to learn. (Behavioural problems and attention difficulties are separate conditions, so it is very important that the teacher provides individual support for each student.)

What to pay attention to? General recommendations:

- Express clear, simple and achievable rules with the student and set goals together. Express the benefits of following the rules and achieving their goals. These should be written down, as this can give you some guidance for later. Ask only what the student can do.
- Positive change should immediately be reinforced and rewarded.

- Only give as many instructions as the student can definitely remember and complete at a time. If they have done their task, they should get positive feedback.
- Always explain before the tasks and instructions why you expect them to solve the task or carry out the instruction.
- Do not keep them waiting unnecessarily.
- Lessons should be organised to be lively, giving students the opportunity to stand up and talk, etc., for example through project work and cooperative techniques. If this is not possible, allow the pupil to move around or at least fiddle with something.
- If you can, always give a choice when completing tasks. Allow the student to choose between two tasks, or to choose how or perhaps with whom they would like to solve the task. A pupil with behavioural difficulties or problems may find it difficult to accept simple prohibitions, which may lead to openly resisting behaviour.
- Since changing ingrained negative behaviour – which is effective and well-established for the student – is a difficult and very slow process, if students make mistakes or "mis-behave", we should also make them aware that we are not acting against them, but we do not like what they have done.
- After every mistake, try to trust the students again and again, to convince them that they can follow the rules and change their negative behaviour.
- Provide enough opportunities for movement and activity, keep them busy so they don't get bored. Boredom can often be the source of negative behaviour.
- Agreed rules must always be consistently respected.
- Through it all, try to remain patient and calm.[3]

See also: Recommendations for pupils with speech impairments in mainstream education. Ensuring communication accessibility.

5. Recommendations for pupils with autism spectrum disorder in mainstream education

Students with autism spectrum disorder whom teachers get to know in the course of learning this subject are students with an intact intellect. They are able to learn the teaching material, but just as with other pupils with a mental disability, they may need special, tailored assistance in the delivery, processing and learning of the material.

What can this assistance be?

- Filtering the material, e.g. exemption from certain parts if it "disturbs" the student too much.

[3] Jenei Andrea—Metzger Balázs (2020) A diagnosztizálás. Magatartási problémák. [Diagnosis. Behavioural problems] RAABE Klett Oktatási Tanácsadó és Kiadó Kft. Budapest

- The use of alternative means or methods to compensate for the disability, according to individual needs (e.g. using a computer instead of handwriting, written tests instead of oral ones, or vice versa).
- Due to the specificities of sensory stimulus processing, it may be necessary to create a permanent, dedicated space in the classroom, a rest area, or use screen and ear protection.
- Seek to ensure a structured delivery of the material and lesson planning, and inform the student about it. Deviate from this only if justified. If you can, indicate the change in advance. If necessary, provide visual cues, e.g. a brief outline.
- They should be informed in advance if there is a change in the order of lessons, the location, the teacher, the requirements for the students, as this can significantly reduce the stress of change and help adaptation and acceptance.
- Communication must be clear and precise. Students with autism spectrum disorder often understand speech literally, so avoid ambiguous, sarcastic or ironic language.
- Processing verbal information may be impeded or slower due to verbal processing, so allow more time than usual to process what was heard.

See also: Recommendations for pupils with speech impairments in mainstream education. Ensuring communication accessibility.

6. Recommendations for hearing impaired pupils in mainstream education.

Students should be given all the help to overcome their hearing impairment, poor language communication skills, disadvantages stemming from abstract thinking and any related learning difficulties, such as

– creating their own glossary – using appropriate language structures and vocabulary,
– explanations for each task,
– a suitable place where they can see and hear speakers clearly.

In frontal and group work with hearing impaired pupils, pay attention to ensuring that they can see and hear the activities taking place in the group.

The assessment should take into account communication difficulties as a result of the hearing impairment, possible vocabulary deficits, poor oral and writing skills, grammatical errors and pronunciation problems.

Do not include in the assessment any requirement which – because of the student's disability – cannot be met at the same level or in the same way as by their hearing classmates (long memorisation, rhythmical pronunciation of poems, dictation, etc.).

The assessment should take the requirements of the individual development plan into account.

See also: Recommendations for pupils with speech impairments in mainstream education. Ensuring communication accessibility.

7. Recommendations for pupils with reduced mobility in mainstream education

The successful participation of pupils with reduced mobility in mainstream education can only be achieved in an inclusive and mutually supportive personal environment (classmates, parents, school staff) that has an impact on the wider environment. In the case of students with severely reduced mobility, a personal assistant may be required.

For pupils with reduced mobility, it may be necessary to use individually tailored aids and assistive technology in the classroom, as well as specialised teaching aids (e.g. a suitably-sized tilting desk, a height-adjustable safe chair, aids that help reading, writing and communication, adapted maths tools, etc.).

Participation in extra-curricular activities and programmes can be difficult, so we need to extend the use of specific methods and tools to these situations, and prepare the student for the expected circumstances, behaviour and performance expectations.

For working with the material, it may be necessary to

- adapt the content of the subject to the specific needs of students with reduced mobility,
- ensure individual progress,
- use individual methods in differentiated (ideally individually tailored) education and training,
- provide opportunities for active learning that is problem-based, motivating and research-based,
- create personal learning spaces and adapted learning environments – create accessible and accident-free environments.

8. Recommendations for visually impaired pupils in mainstream education

When adapting the teaching material, take into account that the lack of or reduced sight changes how visually impaired students gain knowledge. Instead of a visual orientation towards the outside world, it is also characterised by haptic (a combination of skin and movement sensations) and auditory knowledge processing. In adapting the teaching material, it is important to create opportunities to engage all the senses – hearing, touch, smell, taste – and to raise awareness of the use of existing sight.

Lack of sight, low vision and visual impairment can also make everyday activities of school life difficult: orientation, transport, independence. That is why the teacher should organise learning in a relatively

stable and safe learning environment. It may be necessary to enlarge textbooks and other texts, provide appropriate lighting conditions, or provide auditory material instead of reading material.

9. Recommendations for pupils with speech impairments in mainstream education

When mainstream teaching pupils with speech impairments, try to ensure communication accessibility. Key features of an accessible communication environment:

- determining the amount and complexity of verbal learning along injury-specific lines,
- creating a relaxed and safe atmosphere in everyday communication situations and in class,
- the extra time given to express thoughts helps reduce fear of speaking and significantly improves performance,
- developing a processing and assessment method that best suits the student's ability structure and resilience, and allowing more time for exercises (classwork, homework),
- applying non-linguistic approaches in processing the teaching material and in assessment, e.g. movement, drama, drawing or other visual processing as well as digital applications can be used via different art forms,
- for students with language difficulties it may be necessary to simplify the language of oral and written instructions and tasks,
- make most of the learning material available to the student in digital format wherever possible,
- provide a possibility to use reading programs,
- they can take notes on a laptop or other digital device in class, take photos of the sketches on the board and/or record important explanations in class as audio material.

10. Recommendations for pupils with learning disabilities in mainstream education

10.1. Reading disability (dyslexia)

For students with dyslexia it is also important to maintain their reading skills, so be sure to provide reading materials. Please pay attention to the following:

- the length and linguistic structure of the texts,
- help them interpret the text by asking questions and giving points of view,
- teaching should be done using an auditory approach: auditory interpretation of texts or visual support for learning (e.g. pictures, mind maps, printed lesson plans, presentations, auditory presentation of texts – editing audio files, audio books, optical character recognition, etc.),

- when developing skills, pay attention to the use of meta-linguistic expressions, memory tasks and the development of perceptual functions, or, if these are difficult, to ensure that such tasks are in accordance with the student's ability, e.g. learning fewer memorisers.

See also: Recommendations for pupils with speech impairments in mainstream education. Ensuring communication accessibility.

10.2. Writing disorder (dysgraphia)

A priority in teaching dysgraphic students is to promote their ability to use written language (whether in cursive, print or typed versions) for communication, knowledge acquisition, knowledge building and establishing social relationships. To achieve this:

- they can use a laptop or smart device to take notes,
- they can take photos of the sketches on the board, or get a preliminary sketch,
- use oral assessment instead of written assessment.

10.3. Spelling disorder (dysorthography)

In the case of a student with dysorthography, make sure that:

- they can use ICT, spell-checking and correction software,
- they have the opportunity to self-check,
- spelling is not taken into account when assessing and rating,
- oral assessment is used instead of written assessment.

For more information, see: Writing disorder (dysgraphia)

10.4. Maths disability (dyscalculia)

In solving the tasks, students with dyscalculia should:

- use the mathematical operations they know and can use,
- otherwise use aids and compensatory tools or be given other tasks that do not require mathematical knowledge,
- be given help to interpret and model mathematical problem-solving tasks and arguments with diagrams and pictures.

References

Guidelines for the education of pupils with special educational needs. https://www.oktatas.hu/kozneveles/kerettantervek/2020_nat/iranyelvek_alapprogramok. Downloaded on 26 January 2021

Act CXC of 2011 on National Public Education

Annex 2

Environmental protection and sustainability in the framework curricula for grades 9-10

HUNGARIAN LANGUAGE AND LITERATURE	**Curriculum topic**	**Related sustainability content:**
	Communication – concept, tools, types, disorders; digital communication	Impact of mass communication on thinking. Media addiction, dangers of virtual reality
MATHEMATICS	**Curriculum topic**	**Related sustainability content:**
	Sets	Selecting elements with specified properties from a concrete or digitally represented basic set taken from everyday life, other subjects or mathematics
	Mathematical logic	Games helping with conscious financial planning
	Combinatorics, graphs	Creating a task text to match a given graph and "submitting a task" in group work
	Sets of numbers, operations	Use of appropriate rounding for measurements in or near the classroom Examining the consequences of measurement error when a measurement is made
	Proportionality, percentage calculation	Analysis of household bills, taking unit prices and amounts payable into account
	Linear equations, inequalities, systems of equations	Solving word problems in several different ways, comparing the advantages and disadvantages of different solutions Investigating problems with missing, over-defined or contradictory data Solving open-ended problems
	Concept of functions, function properties	Analysis in groups of complex graphs on real-life situations, such as demographic issues, financial tasks Taking measurements of time-varying processes in everyday situations and depicting the measured data in a coordinate system (e.g. temperature)

		Plotting and analysing graphs related to students' daily lives (e.g. distance-time graph to school)
	Basic geometry	As numerical data only, determination and estimation of real distances based on the scale map
	Rectangles, polygons	Project work: drawing up a floor plan to scale of an apartment/school
	Descriptive statistics	Carrying out planned statistical data collections, visualisation of results using graphs, and student presentations to evaluate the results
HISTORY	**Curriculum topic**	**Related sustainability content:**
	Civilisation and state structures in ancient times	Civilisations of the Middle East: appearance of money Roman civilisation: Roman urban architecture, amphitheatres, baths, aqueducts and roads.
	Conquering empires	A Eurasian empire: the Huns – Migration.
	Medieval Europe	The world of the peasantry – from self-sufficiency to the production of goods. Famines, epidemics, uprisings. The world of citizens: Medieval town and its inhabitants. Local and long-distance trade.
	The golden age of Kingdom of Hungary in the Middle Ages	Matthias Corvinus of Hungary: – Centralised royal power. – Income and expenditure. – Empire-building plans.
	Early modern times	Geographical discoveries: – Early colonialism and its consequences. – The emergence of world trade. Early capitalism: – Price revolution. – Manufactories. – Banks and stock exchanges. – European division of labour and its consequences.
	Age of Enlightenment	Enlightenment: – Experience and reason – the new worldview of the Enlightenment. – Enlightenment theories of the state. – Theory of free competition.

	The French Revolution and its impact	The outbreak of the revolution and the Declaration of the rights of Man and of the Citizen.
	Hungary in the 18th century	Hungary's repopulation and resettlement: – Internal migration, organised resettlement and voluntary resettlement. – A multilingual and multi-religious country. – Economy and lifestyle.
	New ideas and the age of industrialisation	Waves of the industrial revolution: – First wave: textiles, mining, metallurgy. – Transport revolution. – Second wave: electronics and chemicals. – Factory and assembly line. – Social and environmental impacts of industrial revolutions.
CHEMISTRY	**Curriculum topic**	**Related sustainability content:**
	Structure and properties of materials	Performing simple calculations on the amount of a substance, e.g. calculating the approximate number of water molecules in a sip or drop of water, the number of iron atoms in an iron clip, the number of beet sugar molecules in a sugar cube, or the number of sulphur molecules in a sulphur crystal of a given weight Conducting or searching the web for demonstration experiments to illustrate similar chemical properties of elements in the same group (e.g. comparing the chemical reactions of potassium and sodium, magnesium and calcium, chlorine and iodine), and illustrate the experimental results Analysing melting point, boiling point and solubility data, looking for the relationship between the structure and properties of materials Designing an experiment in groups of 3-4 people to investigate the properties of a material and determine the type of lattice based on the properties Creating animations to illustrate the structure and motion of gases, liquids and solids Short presentation on the increase in volume of water during freezing Interpreting the concentration values on mineral water bottle labels

	Chemical transformations	Conducting simple test tube experiments on different reaction types: exothermal – endothermal, acid-base – redox, gas evolution – precipitation, instant reaction – time reaction Solving simple, real-life stoichiometric problems of practical relevance based on the reaction equation Demonstration of chemical equilibrium using carbonated soft drinks Investigating the properties of the most common and well-known acids by simple test tube experiments (reaction with alkalis, metals, limestone), observing, recording and explaining the results Making a presentation on alkaline substances/solutions in the household, their chemical composition, uses and safe handling Homework or presentation on "Electrochemical power sources in practice" – composition, construction, operation, uses, environmental aspects Starting a debate with arguments on "Can a car run on water?"
	Simple organic compounds of carbon	Presentation of the characterisation criteria of substances using the simplest hydrocarbon, methane, as an example, analysis of the relationship between structure and properties, searching for correlations Short presentation on methane and firedamp explosions Introducing the most typical representatives of the different groups of organic compounds (ethanol, diethyl ether, acetone, acetic acid, ethyl acetate), observing the most typical properties of the substances, searching for links between the properties of the substances and their everyday use Gathering information about the organic acids in our environment and our body and their importance
	Chemical basis of life functions	Making a set chart, a logic map to review organic compounds of biological importance Simple student experiments to observe the properties of vegetable oils and animal fats

		Making a video on "Carbohydrates in the household", showing the classification, origin, properties and uses of carbohydrates in our homes Short presentation on the importance of essential amino acids A debate with arguments for and against single-use plastic cups, plates and cutlery, and those made from paper and wood: "Why does/can cellulose replace plastic party supplies in many places?"
	Elements and their inorganic compounds	Searching and using applications in Hungarian and foreign languages to learn about the properties of materials, critical processing of the information obtained, clarification with the help of textbooks. Short presentations on the role of some non-metallic elements and their compounds in everyday life (e.g. "Chlorine and water purification", "Sulphur in wine making", "Activated carbon and adsorption", "Silent killer – carbon monoxide", "Why is carbon dioxide called must gas?") Making presentations on the history of science (e.g. "János Irinyi and the match", "Haber and Bosch's ammonia synthesis", "Ignác Semmelweis and chlorine disinfection")
	Chemistry in industrial production and everyday life	Preparing a comparative table to show the main properties of cement, concrete, glass, limestone, wood and steel Interpreting labels of plant protection products, emphasising the importance of safe, careful use Short presentation on the potential uses of different petroleum distillates A debate with arguments on the need for fertilisation Gathering information on the composition of gasoline, additives, the possibility and limits of increasing octane number Short presentation on further processing of petrol in the chemical industry, pyrolysis, production of polyethylene, polypropylene, polybutadiene A debate with arguments on the advantages and disadvantages of using plastics

		Brainstorming ideas on how to reduce the amount of plastic products we use in our everyday lives Collecting information on degradable plastics Gathering information and making presentations on E numbers Initiating a discussion on the importance of respecting the expiry date of medicines, overview of potential risks Writing an opinion piece on the short- and long-term effects and side effects of doping substances Making a presentation on the physical and psychological effects of the most common drugs Gathering information on the composition of synthetic detergents, their suitability for use in hard and soft water, the PH of their aqueous solutions, the functioning of intelligent molecules Overview of water-softening methods based on model experiments, analysis of water hardness maps of Hungary and Europe
	Environmental chemistry and environmental protection	Make a short presentation on "The most pressing global problems facing humanity" Visiting environmentally conscious companies and businesses around the area, making a presentation about what was seen Organising a theme day or week on environmental awareness Project: "The great environmental disasters of the 20th century", a short presentation of the project content Gathering information on the principles of green chemistry, identifying the obstacles to goals that are more difficult to achieve Making a logical map of the components that make up the atmosphere and the most common pollutants Collecting suggestions on how to reduce air pollution

		Create a poster on the local or regional water utility's method for producing drinking water, or the wastewater treatment process Testing the operation of an aquarium filter Simple modelling of soil contamination Create a project or video on "How to achieve a waste-free life" Watch a video on waste recycling
PHYSICS	**Curriculum topic**	**Related sustainability content:**
	Physics of transport and sport	Explain the acceleration and braking of a car using the forces acting on the car and Newton's laws Physical explanations of the operation of (sailing and propeller) ships and submarines, the importance of a streamlined body when moving through the water The physics of aircraft, explaining the lift on the wing, the importance of a streamlined shape
	Energy	Data collection on human energy consumption Energy transformations in the household, the environment, the human body and power plants (thermal, wind, hydro, nuclear, solar), efficiency Energy transport options The Sun as the primary source of the Earth's energy supply. Distinguishing between renewable and non-renewable energy sources, describing them, the relationship between energy production and the state of the environment Possibilities for using our energy resources in the future.
	Consequences of heating and cooling	Observing and interpreting the phenomenon of thermal expansion Concepts of combustion heat and calorific value, recognising slow and rapid combustion in everyday life Observing changes of state (melting, freezing, evaporation, condensation, boiling and sublimation), for example during kitchen activities. Recognising the difference between reversible and irreversible processes
	Water and air in our environment	Relationship between air pressure and weather

		Options for thermal insulation in the home. Unusual thermal expansion of water and its consequences in nature. Ice formation on lakes, icebergs Perform simple calculations on changes in air quality parameters
	Machines	Comparing machines based on performance and efficiency data Physical explanation of the bicycle's construction and operation Discussion on robots: their proliferation, future role, artificial intelligence, machine learning, self-driving
	Electricity in our environment	Gathering characteristics of the most important heat-based household appliances Understanding the electricity bill, calculating the cost of electricity consumption in the household, the relationship between kWh and joules Electrical network and safety equipment of homes (function of the fuse, circuit breaker and earthing conductor)
	Generators and engines	Recognising transformers in our environment and in technical devices Observation and physical explanation of the operation of generators and engines
	Role of waves in communication	Sound pollution in our environment, proposals to reduce noise pollution Observations and physical explanations of the applications of electromagnetic waves at different frequencies in the use of our every-day tools: parking sensor, microwave oven, infrared camera, X-ray machine, materials testing Scientific debate on the potential harms of mobile phone use
	Atoms and light	Light is an electromagnetic wave, character-ised by physical quantities (amplitude, frequency, wavelength, propagation velocity) Comparing electron microscope and light mi-croscope images. Understanding the higher resolution and operation of the electron mi-croscope with the wave nature of electrons The most important atomic models Reviewing the light sources we currently use, the physics behind their operation (LED, bulb, fluorescent, halogen)

	Preserving the integrity of our environment	Role of ozone layer in relation to ultraviolet radiation reaching the Earth, measures taken to protect the ozone layer and their success Physical explanation of greenhouse effect Alternatives to energy production, ways to reduce greenhouse gas emissions Studying the core composition, binding energy and stability of the most important elements based on the periodic table Understanding the essence of fission and fusion with the help of explanatory diagrams and animations Comparing the advantages and disadvantages of nuclear and thermal power plants and renewable energy production after preliminary data collection Data collection on the work of Jenő Wigner, Ede Teller and Leó Szilárd Properties of alpha, beta and gamma radiation, their physiological effects, and how to protect against each type of radiation Collecting material on radium and the life of the Curie family Scientific debate on the danger of radioactive isotopes released into the environment or used in medical treatment
BIOLOGY	**Curriculum topic**	**Related sustainability content:**
	Science of biology	Going through articles from scientific journals, writing extracts and reflections
	Living world as a whole, principles of structure and function	Understanding the relationship between inorganic and organic substances from a scientific, technological and biological perspective, carbon-based life Arguing for the vital role of water for life Deepening the understanding of the principle of regulation, using technological examples from everyday life, and recognising the importance of a controlled steady state
	Life and energy	Justifying the biological role of photosynthesis with arguments, knowing the basic equation of the process, distinguishing its main stages Understanding the material and energy flows of biocenoses, depicting the carbon cycle on a graph, connecting it with cellular processes
	Molecular basis of variability	Recognising the link between mutations and diseases (metabolic disorders, cancer), analysis of specific examples Demonstration of the application of genetic engineering in medicine, pharmaceuticals,

		plant production, animal husbandry, food industry with examples (human genome project, gene therapy, genetically modified organisms) An overview of the reasons for the emergence of bioethics and the main areas of application, reasoning based on the principles of bioethics (e.g. benefits and risks of genetic research, animal testing issues, transplantation and biorobotics, predicting future impacts)
	Single-level inheritance	Understanding the influence of the environment on phenotypes, justifying with examples Understanding and evaluating the purpose, current applications and future potential of personalised treatment options
	Biological evolution	Biological evolution Examples of natural variation from DNA level to individual-level differences Learning the main arguments in support of Darwin's theory of evolution Examples of macroevolutionary (level above species) changes: evolutionary novelties, extinctions, adaptive radiation
	Biological bases of behaviour, relationship between mental balance and physical condition	Biological bases of behaviour, relationship between mental balance and physical condition Analysis of the biological roots of human behaviour and human characteristics based on a comparison with animal behaviour and an evolutionary approach Demonstrate the factors that determine the thinking process applied to a specific case (problem solving)
	Characteristics of habitats, adaptation, biodiversity of biocenosis	Understanding the concept of abiotic environmental factors and linking them to physiological and ecological tolerance General understanding of environmental tolerance, identification of types based on examples Examining the chemical and physical properties of air and analysing their effects on living organisms Analysis of factors affecting water quality in freshwater and marine habitats through examples Learning the chemical and physical properties and qualitative characteristics of soil, comparison of main soil types

		Analysis of the carrying capacity of the environment Analysis of the relationships that determine the interactions of populations, identifying and recognising the main types based on concrete examples Examining the conditions and characteristics of ecological stability, identifying risk factors Assessing the biological importance of habitat and protected species conservation, reviewing opportunities for individual and social action to support this, and collecting successful examples
	Values of the Earth and the Carpathian Basin	Connecting the Earth's position in the solar system, its cosmic environment and planetary features to the potential for life on Earth, and identifying the characteristics associated with the long-term survival and evolution of life Presentation and assessment of some of the key terrestrial habitats, specific biocenoses and protected species (e.g. the Amazon, African rainforests and savannahs, high mountains, grasslands, etc.) Studying the Earth's ocean and marine biocenoses, analysis of some examples of high importance, presentation of their valued assets to be protected (e.g. coral reefs) Watching nature films showing the Earth's wildlife from different perspectives, discussing the experiences and knowledge gained Analysing the geological and climatic conditions of the Carpathian Basin and the interactions between farming and the Carpathian Basin Understanding the relationship between the Carpathian Basin and the Eurasian and African biota (plant distribution, bird migrations) Learning about the typical biocenoses of the Carpathian Basin, presenting an endemic or relict species and evaluating their importance Examining the characteristic natural features and biocenoses of some national parks in Hungary, presenting typical plant and animal species Taking nature photographs and films in a domestic environment, viewing and discussing them individually and in groups
	Humans and biosphere – sustainability	A complex understanding of sustainability, exploring the links between natural, technological and economic processes

		Identifying the effects of human activities on living systems based on data, and exploring potential consequences Analysing and articulating individual, community, national and global responsibilities and opportunities for action related to sustainability Critical analysis of historical and contemporary technologies in crop and animal production, forestry and hunting, fisheries and fish farming from the perspective of sustainability, and search for alternatives Understanding global environmental processes, e.g. methods for studying climate change ("big data", computer modelling), assessing the reliability of predictions Highlighting the legislation on environmental protection and nature conservation as well as the importance of international conventions with examples Learning about, and where possible supporting, the activities of civil initiatives and organisations related to ecological sustainability Active participation in thematic programmes on sustainability
GEOGRAPHY	**Curriculum topic**	**Related sustainability content:**
	Lithosphere	Developing a geographical spatial perspective, systems thinking and environmentally aware, sustainable behaviour through knowledge of the everyday implications and applications of geological processes Everyday aspects of geological processes and adaptation strategies (geothermal energy use, geological risks and hazards) Recognition, simple analysis and economic uses of basic minerals and rocks, 21st century trends in the exploitation of mined raw materials
	Atmosphere	Developing logical and systems thinking by understanding the differences between weather and climate and their characteristics Developing systems thinking, individual and collective responsibility, environmentally aware and green attitudes as well as responsible decision-making through knowledge of the global and local causes, consequences, mitigation and adaptation strategies of climate change Developing reading comprehension, communication and digital literacy skills in the analysis and oral evaluation of traditional and

		online source texts on climate change (causes, consequences, mitigation strategies) Air warming and the factors affecting it Atmospheric processes as renewable energy sources Global changes and problems of the atmosphere (ozone depletion, acid rain, climate change, smog): causes and consequences Consequences of climate change in Hungary, mitigation and adaptation strategies
	Hydrosphere	Strengthening the application of knowledge about the hydrosphere in everyday life, thereby developing analytical and synthesising thinking, environmentally aware and green attitudes, and individual and collective responsibility Developing reflection and responsible opinion forming by analysing traditional and online news and articles on the hydrosphere Earth's water resources, main types of surface and groundwater and their characteristics Water as a resource: its role in economic and social processes (drinking water, hydropower, industry, agriculture, migration) Environmental hazards related to the hydrosphere (inland water, floods), protection of the quantity and quality of water resources
	Geosphere interactions and interrelationships	Developing environmentally aware and green attitudes through knowledge of the interaction between natural and social factors Developing a realistic assessment of the hazards and risks associated with the processes and phenomena of each geosphere Economic importance of soils, soil degradation and soil protection Shaping the surface by external forces (water, wind, ice) Human activities shaping the Earth's surface
	Changing settlements, different demographic challenges in the 21st century	Developing problem-solving thinking by analysing the socio-economic consequences of demographic stages (transitions), population size and age composition Spatial aspects of the typical population geography processes of the 21st century, e.g. emigration, urban migration, migration, exploring their causes and interrelationships Contradictions of 21st century life in big cities Presentation of global problems resulting from the increase in the world's population and the territorial disparities, and exploring

		the possibilities of mitigating the negative consequences Environmental consequences of urban growth, ways to mitigate environmental degradation, and strengthening a responsible environmental approach by identifying the problems Open-mindedness to the demographic problems of certain regions, responsible and fact-based opinions
	From the national economy to the global world economy	Developing evaluative thinking based on an analysis of the causes of different levels of socio-economic development in different regions of the world Developing the ability to form opinions and think evaluatively by systematically analysing the socio-economic and environmental consequences of globalisation and its impact on our everyday lives Developing complex thinking skills by showing the interrelationship between central and peripheral regions Characteristics of the socio-economic development of peripheral regions and difficulties in catching up Unique development paths using the example of countries with specific roles Sparking interest in learning about the cultures of other societies and developing tolerance for different cultures
	Hungary and the Carpathian Basin in the 21st century	Strengthening national identity by presenting and organising Hungary's natural and social values Developing the ability to form opinions and think evaluatively by presenting and analysing current social and economic processes
	Money and capital movements in the world economy	Developing problem-solving thinking by understanding and interpreting financial decisions in everyday life Comparison of investment opportunities available in the current financial situation, showing the benefits and potential risks (investment triangle) in order to develop responsible financial thinking Using everyday examples, illustrating the links between borrowing and development and the risk of over-indebtedness at the level of individuals and national economies Link between globalisation and the emergence of global financial crises

	Local problems, global challenges, dilemmas for a sustainable future	Developing contextual thinking based on the explanation and understanding of local, regional and global natural, socio-economic and environmental hazards of geographical origin Developing environmentally aware and green attitudes through analysing the environmental impacts on the geospheres, and demonstrating the interactions between processes. Developing the ability to realistically assess hazards and risks by demonstrating the social consequences of habitat destruction and natural disasters. Complex understanding of the impact of environmental degradation on living conditions and quality of life, and the global consequences of local pollution, and developing the ability to prepare for and protect against its effects Understanding the various natural and socio-economic processes that lead to global problems, and which are simultaneously present on our planet. Identifying their interrelationships, possible ways to mitigate them and their difficulties Adopting environmentally aware civic attitudes by learning about farming and lifestyles that are energy-efficient, energy and input saving, and "green" Developing consumer awareness by presenting the characteristics of consumer society and a conscious consumer community Comparing traditional and electronic shopping from a consumer protection perspective National and international organisations working for environmental protection and humanitarian purposes, the need for international cooperation Developing green attitudes by introducing the characteristics of sustainable economy and sustainable management Opportunities for the active participation of individuals in society, examples of active involvement to protect the environment
VISUAL CULTURE	Curriculum topic	Related sustainability content:
	Period, style, genre	Gathering information individually on a problem (e.g. relationship to reality, transcendence, social or scientific changes) specific to a chosen period of art history or style (e.g. Gothic, Renaissance, Baroque, Realism, turn-of-the-century Isms, Op-art, Pop-art, Land-

		art, Hyperrealism), interpreting the problem or theme independently, using the possibilities of visuality (e.g. photo series, poster, presentation), reflecting on the language of expression of our time
	Contemporary art phenomena – Artistic concept, personal and social message	Representing abstract concepts of personal interest, grounded in social or scientific knowledge, with contemporary imaging possibilities Free experimentation with abstract content through the creation of a plastic work of art using self-designed materials
	Mechanism of visual communication – Visual information processing	Comparative analysis and independent presentation of experiential reality and media representations of reality in different media (e.g. news programme/news site, TV advertisement, reality show, documentary)
	Digital imaging, social media – creating digital content, personality	Analysing selected online presentations of personal content (e.g. blog, vlog, personal profile on social media) in terms of visuality and content organisation (e.g. image/text ratio, menu system/tags and content correspondence, communicative function of colours, interactivity, hypertextuality) and presenting and discussing the experiences individually or in groups.
	Design, fashion, identity – Designed environment, identification	Creative, function-changing transformation of a drawing of a real or fictitious factory building after observing the objectives and formal language of organic architecture (Le Corbusier, Hundertwasser, Gaudi) After learning about the work of Károly Kós, Imre Makovecz and György Csete, designing community spaces and their environments with an organic approach. Making a model based on the plans using selected materials and tools Based on personal examples, analysing the factors influencing the current fashion and the short-term changes thereof (e.g. material environment, consumer habits, socio-economic-cultural background) in creative tasks (e.g. creating a style sheet, character creation according to given criteria, designing a fictitious brand for a given purpose) to strengthen their own identity Responding to the expectations of our time in the work designed and created
	Environment and sustainability – Balance between natural and built environment	Creating a design or model of a work or product (e.g. works of public art, action, interactive space, event, structure, social media

		campaign, installation) that reflects a local or global environmental problem (e.g. nature, air, water, light, transport, consumerism, living in big cities, civilisation threat). Studying and assessing the selected problem (e.g. water wastage, school leavers releasing balloons, littered pavements, bus stop damage), the location (e.g. town, public space, car park, water tower, school) and the ideal means of presentation (e.g. event art, advertising, visuals, sound, film language) individually and in groups in order to prepare the plans properly Using the environmental design characteristics of historical periods and modern societies in a reflective way, and applying aesthetic and functional criteria, prepare plans and concepts for solving environmental problems in the immediate area (e.g. suitable space for joggers and runners, waste collection and storage, reducing the amount of packaging materials) also in group work, with a clear visual and textual presentation of the concept Designing an ideal living space (e.g. apartment, garden, park, village, city, school, roads) in accordance with the principles of sustainability and environmental awareness, focusing on the harmony and balance of its natural and built material environment (e.g. architecture that blends into the surroundings, land art), making inspiring use of the characteristics of contemporary environmental design and the problem-solving potential of design thinking, also in group work Learning about modern guidelines for the protection of historic monuments. Making a presentation on a building in or around your area that is to be renovated in connection with preserving the building or changing its function
DIGITAL CULTURE	**Curriculum topic**	**Related sustainability content:**
	Information society, e-World	Searching for information in a search engine that matches their interests and studies, and filtering the results efficiently
	Creating multimedia documents	Presentation of projects in other subjects using multimedia documents
	Publishing on the internet	Preparing and publishing a web document on a chosen topic in a group, using the given styles or partially modifying them

	Spreadsheets	Processing data in a project related to other subjects using spreadsheet software, and drawing conclusions from the results

Green Planet

TEACHER'S HANDBOOK