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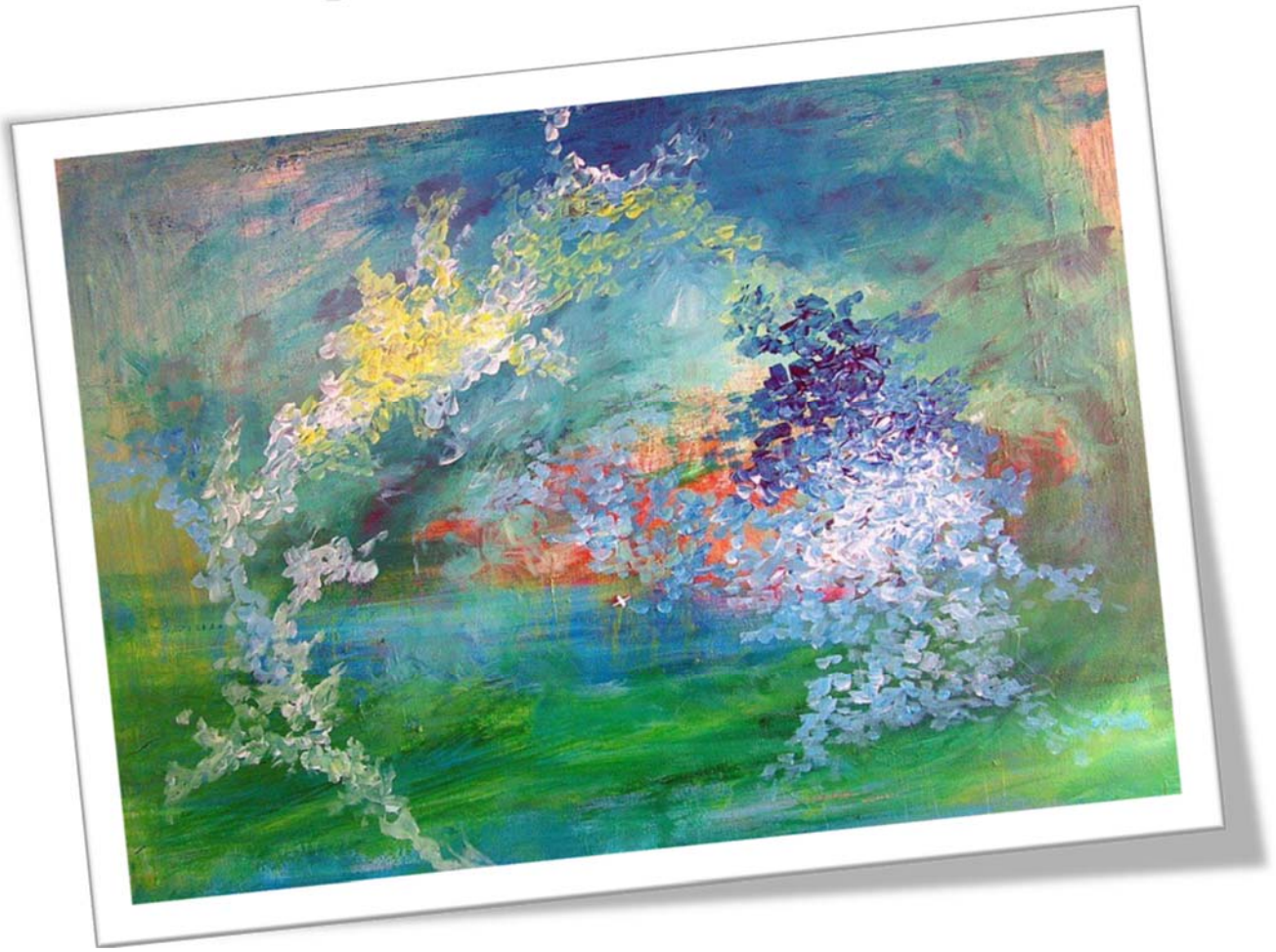
Back to Nature



Handbook

2018

Back to Nature user's manual, made of theoretical and methodological materials and lesson plans of the teacher training.

First edition

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Back to nature

Environmental pedagogy for improving primary school teacher's competences in transmitting knowledge in an experience way through environmental education

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1 Basics of environmental education

1.1 The definition of environmental education

„Earth does not belong to us. We belong to Earth. All things are connected like the blood that unites one family. All things are connected. Whatever befalls the Earth befalls the children of the Earth…" (Chief Seattle)

Experts dealing with environmental education have realized that if the values of our natural environment are to be preserved and protected, it is not enough if people get to know and learn to love them. It is essential that they also understand the social and economical processes that influence the state of our Earth to the greatest extent nowadays. The environmental problems, as well as their causes and the opportunities to solve them, are extremely complex. As a consequence of this, it is not an easy task to define environmental education, either. It is important for us to see that it is not sufficient if environmental education conveys only ecological knowledge. People must be made conscious that the natural environment is in close relationship with the social and economic systems, too. Due to these, the concept of environmental education has expanded continuously in the past decades.

Environmental education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among humans, their culture and biophysical surroundings. Environmental education also entails practice in decision-making and self-formulation of a code of behaviours about issues concerning environmental quality. (IUCN, 1970)

Environmental education intends to provide "tools" for people by means of which they can remedy some environmental problems so they can improve their own quality of life.

Environmental education includes education about culture, worldview and lifestyle at the same time. It conveys information, motivation and values. It confirms people's involvement in the more effective use of natural resources and responsibility for preserving the state of the environment.

Environmental education in school is the pedagogical process during which we prepare children so that they can get to know their environment, process their experience as well as act in a conscious way taking the interests of the biotic and abiotic environment into consideration.

Environmental education develops the intention and ability of children to familiarize themselves with the environment actively, makes them able to understand the changes and signs of the environment, to analyze them in a consistent system, to look for problems, to understand their causes, to think critically and creatively, to look for possible solutions, to understand the responsibility of individual and community decisions and to take responsibility in environmental issues. (KöNKomP, 2004.)

Environmental education has been defined by many in a number of ways. The Tbilisi Conference held between 14th and 26th of October 1977 clarified the paradigm regarding environmental education. According to their definition: „Environmental education is a process the objective of which is that the population of the world should think in an environmentally conscious way and pay attention to their environment and all the problems related to it. People should have all the knowledge, attitude, abilities and motivation necessary for this and aim for solving the current problems as well as preventing new ones." (adapted by the definition found in the Tbilisi Declaration, 1977) We still regard this as the basic definition of environmental education.

1.2 The history of environmental education

The idea of environmental education was born in the developed western societies where the environment had become unbearable for the population. The reasons for this: increasing population density, large-scale urbanization, air and water pollution, untreated waste, decreasing number of natural habitats and the extinction of certain plant and animal species. In 1962 Rachel Carson's educational book entitled *Silent Spring on the harmful effects of the DDT pollution* was published, which was based on scientific bases.
(the book can be found here: https://www.google.hu/search?q=Silent+Spring+on+the+harmful+effects+of+the+DDT+pollution&source=lnms&tbm=isch&sa=X&ved=0ahUKEwj0iY-e1YDeAhWHyqQKHWZ_AEwQ_AUIDigB&biw=1366&bih=608#imgrc=mDb7U73FKHT31M:)

After the publication of the book more and more people urged environmental education more and more forcefully. Many agree that this book initiated the environmental movements in the 1960s and 1970s.

The movement of environmental education became stronger and stronger from the beginning of the 1970s. The United Nations Conference on the Human Environment held in

Stockholm in 1972 gave fresh impetus to its work, where a proposal was made about the idea that every country recognize and support environmental education.

The first document of the United Nations (UN) on environmental education, the Belgrade Charter was completed in 1975 (the summary of it can be found here: http://www.medies.net/_uploaded_files/TheBelgradeCharter.pdf)

In 1975 the UNESCO and the environmental program of the United Nations (UNEP) started the International Environmental Education Program (IEEP) that lasted until 1995 and had a widespread influence.

In 1977 in Tbilisi, at the first international conference of the world on environmental education, those environmental education directives were accepted, on the basis of which the further work was carried out.

From the beginning of the 1980s, environmental education established an interaction with the areas of human literacy so it also affected health promotion and social skill formation.

Due to emerging problems in the middle of the 80s, a new UN conference was initiated. The World Commission on Environment and Development, established in 1983, played a crucial role in preparing the contents of the conference and reinforced the concept of sustainable development.

In 1992 from 3 to 14 June From 3rd to 14th June 1992, in Rio de Janeiro the United Nations Conference on Environment and Development (UNCED) was organized, also known as the Rio de Janeiro Earth Summit , Rio Summit, Rio Conference, and Earth Summit. It was a major United Nations conference held with the participation of 172 governments. The most important document, adopted on this conference, was the document called Agenda 21. This document fixed the main guiding lines for the sustainable development issues for the 21st century.

The World Summit on Sustainable Development, held in 2002 in Johannesburg, showed that the fundamental change in attitude and behaviour had not happened yet, progresses were evaluated on this conference.

According to this evaluation, the results are modest and new ways of implementations has to be found.

Nowadays, the international professional community does believe that the values, behavioral forms and lifestyle that are regarded important, concerning a sustainable future must be formed and encouraged through education.

They view of education, aimed at sustainable development, is a process, during which we learn to make decisions that take the economy, ecology and social welfare (long-term future) of every community into consideration. The new concept of education emphasizes the necessity of a holistic, interdisciplinary attitude in the field of the development of knowledge and skills, necessary for building a sustainable future and puts significant emphasis on the changes, concerning values, behaviour and lifestyle.

Everybody must be made capable of making decisions and acting in harmony with local demands, which make them able to take part in the fight against the problems that threaten our common future.

On the 20th December 2002, the 57th General Assembly of the United Nations declared the period between 2005 and 2014, the Decade of Education for Sustainable Development.

Education, serving sustainability, has the most important aims, defined by UNESCO as follows: interdisciplinarity, learner-centred learning, education aiming at the future, education facilitating the equality of the sexes, civic education facilitating a democratic society, education for a culture that respects peace and human rights, health education, education in connection with knowledge regarding population, education in connection with the knowledge concerning the protection of natural resources and their management and education concerning sustainable consumption.

1.3 The characteristics, aims and tasks of environmental education

The aim of environmental education is complex. It covers a number of areas, that is, environmentally conscious behaviour, facilitating an environmentally responsible lifestyle, forming behaviour, value system, attitude and emotional approach, and expanding knowledge about our environment and society. It also has scientific, artistic and sociological dimensions. As for its contents, it is transdisciplinary, that is, it cannot be linked to any traditional subjects. It can be built into the material of sciences as well as humanities. Its task is to form an environmentally conscious approach, abilities, skills and positive attitudes. Environmental education is successful, if it permeates the whole personality, and if beyond the acquisition of

cognitive elements – knowledge, experience - it has an effect on the field of attitudes, emotional approaches and behavioural ways as well. If it arouses interest and curiosity, develops imagination, provides time for joyful wonder, taking delight in things, enjoying beauty and if it gives opportunity for experiencing faith, love and happiness.

As János Lehoczky wrote (1999): „The aim of environmental education is diverse, not only delivering knowledge concerning environmental protection. It tries to have an effect on the whole personality, by means of knowledge for the mind, experiences for the emotions and direct activities for the volition." (original Hungarian quotation: http://tiszaikornyezet.weebly.com/a-koumlrnyezeti-neveleacutes-ceacutelja-eacutes-fontossaacutega.html)

2 Environmental education from multidisciplinary approach

2.1 Topics of the environmental education

As presented in the previous chapter (1.1), environmental education and education for sustainable development are more or less linked, as also mentioned in several declarations. The document on Education of Sustainable Development (ESD), as suggested by UNESCO, should cover the following (UNESCO, 2018):

Learning content: Integrating climate change, biodiversity, disaster risk reduction (DRR), and sustainable consumption and production (SCP), into the curriculum.

a) **Pedagogy and learning environments**: Designing teaching and learning in an interactive, learner-centred way, that enables exploratory, action oriented and transformative learning. Rethinking learning environments–physical, as well as virtual and online– to inspire learners to act for sustainability.
b) **Societal transformation**: Empowering learners of any age, in any education setting, to transform themselves and the society they live in.
c) **Enabling a transition to greener economies and societies**: equipping learners with skills for 'green jobs' and motivating people to adopt sustainable lifestyles.
d) **Empowering people to be 'global citizens'** who engage and assume active roles, both locally and globally, to face and to resolve global challenges and ultimately to become proactive contributors for creating a more just, peaceful, tolerant, inclusive, secure and sustainable world.

e) **Learning outcomes**: Stimulating learning and promoting core competencies, such as critical and systemic thinking, collaborative decision-making, and taking responsibility for present and future generations.

The document, Curriculum Framework – Education for Sustainable Development (ESD)(KMK-BMZ Project group, 2016), proposes several thematic areas (see below):

a) Diversity of values, cultures and living conditions: Diversity and inclusion
b) Globalisation of religious and ethical guiding principle
c) History of globalisation: From colonialism to the "Global Village"
d) Commodities from around the world: Production, trade and consumption
e) Food and agriculture
f) Illness and health
g) Education
h) Globalised leisure-time activities
i) Protection and use of natural resources and generation of energy
j) Opportunities and risks of technological progress
k) Global environmental change
l) Mobility, urban development and traffic
m) Globalisation of economy and labour
n) Demographic structures and developments
o) Poverty and social security
p) Peace and conflict
q) Migration and integration
r) Political rule, democracy and human rights (Good Governance)
s) Development cooperation and its institutions
t) Global Governance
u) Communication in the global context

It is important that educators do not "close down" the list of the thematic areas, i.e. the selection of the thematic areas and/or to add more of them if needed or required, should be in the domain of the educator within the education (e.g. special local sustainability issues).

In the context of the construction of curricula, topics required by the education of sustainable development should be designed on learning situations, according to the subject-specific and cross-curricular possibilities.

Education has an important role to play in the process of changing society. This was introduced by the UNESCO for the Decade of Education for Sustainable Development UNESCO, 2005 *to promote an education in solidarity capable of generating responsible attitudes and commitments, and that prepares citizens to make well-founded decisions aimed at achieving culturally plural, socially just, and environmentally sustainable development*. As well, the document contains the guidelines, how to implement the objectives of the Decade, i.e.: i) Promoting and improving quality education (basic education focusing on sharing knowledge, skills, values, etc. for encouraging sustainable livelihoods, sustainable lives of citizens); ii) Reorienting educational programmes (rethinking and revising education focusing on the development of knowledge, skills, perspectives and values related to sustainability important for societies); iii) Building public understanding and awareness(using a widespread community education and a responsible media for spreading the information); iv) Providing practical training (contribution of all sectors, gaining the knowledge and skills, resulting in sustainable performing of their work).

According to Robottom (Robottom, 2000), the change of model requires diverse measures and instruments to transform our attitudes, lifestyles, patterns of social participation, and conceptions on how politics is done. As suggested by authors Lukman et al. (Lukman R et al, 2013), incorporating environmental issues into the early stage of education can foster environmentally responsible behaviours, and provide a strong foundation for more sustainable societies.

However, just addressing it through conventional teaching (informational-attitudes), it is not suffice to foster environmental behaviours in the present or in the future. In order to better address the environmental education, schools and their leaders have to tackle sustainability issues through a range of integrated and holistic perspectives that address the array of environmentally responsible behaviour factors. This process needs to engage with different stakeholders (e.g. children, teachers, school principal, parents, curriculum designers, etc.) and address different levels (local community, school community), including structural changes within a school and in primary (family) social environments. In addition, engaging with emotional attitudes, it can be a powerful mechanism to communicate and demonstrate the best practices, and to foster environmental behaviours.

2.2 Competencies of environmental education

It is of utmost importance to stimulate learning and promote core competencies, such as critical and systemic thinking, collaborative decision-making, and taking responsibility for present and future generations. The study "Curriculum Framework for education for sustainable development" (KMK-BMZ Project group, 2016) proposes the primary school competences with the reference to the global development education and to the education for sustainable development, as listed in Tables 1-3. In Table 1 the competencies, in Table 2 the specific assessment and in Table 3 the action performance, as would recognised by pupils after 4 years, are listed.

Table 1: Specific competences recognised by pupils after 4 years

	Core competences	**Specific competences year 4**
Recognising	1. Acquisition and processing of information - acquire information on topics of globalisation and development and processes it topic-related	1.1 Take and process information from presented sources on the life situation of children and their families 1.2 Take news and photos from daily media on current events with appropriate help 1.3 Produce simple tables and graphs on development issues and compare results
	2. Recognising diversity - recognise the socio-cultural and natural diversity in the World	2.1 Realise and describe different and similar life situations of children and their families in different countries depending on the socio-cultural conditions 2.2 Realise and describe different and similar life situations of

		children and their families in different countries depending on the environmental conditions
	3. Analysis of global change - analyse processes of globalisation and development by using the concept of sustainable development	3.1 Use examples to analyse the change of children's life situations with respect of the socio-economic conditions 3.2 Use examples to analyse the change of children's life situation with respect to the environmental conditions
	4. differentiation between levels of action - recognise levels of action- from the individuals to the global level – and their respective function for development processes	4.1 Recognise wishes and changes to realise them depending on the respective life situations 4.2 Compare children's wishes and their realisation chances in different countries 4.3 Use examples to research and present the product cycle of age-appropriate consumer articles

Table 2: Specific estimation gained by pupils after 4 years

	Core competences	**Specific competences year 4**
Assessing	5. Change of perspective and empathy - realise, appreciate and reflect upon own and others' values and their significance for life	5.1 Elaborate and articulate own values with regard to the discussion of unfamiliar value orientation 5.2 Research and compare the historical roots of the own and a

		hitherto unfamiliar value orientation 5.3 Take into account the basic general conditions and values assumption for the proposal of solutions for difficult life situations
	6. Critical reflection and comment - comment on issues of globalisations and development by critical reflecting and orienting at the international consensus at the principles of sustainable development and human rights	6.1 Form an own opinion about conflicts (What are the root causes? Who is egoist? What is unfair? What would be fair/just?) 6.2 Use case examples to study which children's rights are violated and comment on that.
	7. Evaluation of development projects - work out approaches to evaluate development projects (at home and in other parts of the World) taking into account diverse interests and general conditions and come to self-reliant conclusions	7.1 Judge less complex development projects as either sustainable or rather unsustainable 7.2 Judge example of the use of natural resources as either sustainable or rather unsustainable 7.3 Recognise and assess the different interest with respect to development projects and the use of natural resources

Table 3: Action performance as a result of pupils' awareness after 4 years

	Core competences	**Specific competences year 4**
Acting	8. Solidarity and shared responsibility - realise areas of personal responsibility for humans and the environment and accept the respective challenge	8.1 Develop a sense of solidarity from the knowledge about different life situations of children at home and other parts of the world 8.2 Show that it is important and meaningful to act in an environmentally conscious way in one's own environment
	9. Understanding and conflict resolution - contribute to overcoming socio-cultured barriers and self-interest by communicating and - cooperating and contribute to conflict resolutions	9.1 Collectively plan and perform an action with other children 9.2 Strive to get in contact and to understand children who speak other languages 9.3 Participate with own contributions in exchange programmes within school or class partnerships
	10. Ability to act in times of global change - ensure the ability to act socially in times of global changes, most of all in personal and professional fields by innovative as well as by appropriate reduction of complexity and to best open situations	10. 1 Develop possible solutions for difficult life situations and check then critically, e.g. in role games 10.2 Develop and justify own approaches of environmentally sustainable behaviour

	11. Participation and active involvement - pupils are able and willing, based on their autonomous decision, to pursue objectives of sustainable development in private and school fields and to participate in their implementation in society	11.1Propose and justify action against realised problems 11.2 Propose and justify contributions to the solution of environmental problems

As can be seen from the IO1 – A Review analysis of experiential learning practices in primary education in Hungary, Romania and Slovenia, environmental issues have been already integrated in the existing curricula.

In Slovenia, mostly environmental topics or themes are encompassed within the natural science subject. In Slovenia no subject, such as environmental or sustainability education, can be seen among the list of the compulsory and elective subjects in the primary school. On the other hand, there are also some subjects, which can be chosen as elective courses i.e. i) beekeeping (life, products and threatening); ii) chemistry in life and environment (quality of water, air, soil); iii) environment education (air, water, soil, biotic variety, environment and a way of life); iv) physic and ecology (environment phenomena); v) geography (human-nature relationships; environmental protection).A more in-depth view into compulsory subject reveals the following gained-knowledge by pupils in Slovenia:

- Natural science and technic (Ferbar J. Et al, 1998; Marentič Požarnik B. et al, 2004):
  Topics: i) Impacts of humans on environment and nature (water, soil, air pollution; causes and consequences of the ozone hole, global warming, and waste formation; the difference between ecology, nature conservation and environment); ii) maintaining the biodiversity direct with protection of nature and all the biosphere in general (learn about the rare and endangered species in their own environment);iii) the sustainable and durable use of the landscape, especially in protected areas; iv) principles of sustainable development (personal and social choices based on

economic and conservation benefits and risks analysis), v) the environment as a value; vi) energy (suistanable vs. non-suistanable); vii) waste managment.

- Chemistry: harmful substances and their effects on the environment
- Techniques and Technology: minor topics in environmental protection.

The comparison between the review analysis results as performed in Slovenia in primary schools, the teaching year-plans for obligatory and chosen subject and the UNESCO-ESD document (UNESCO, 2005) revealed, that subjects of natural science, chemistry and physics deal with topics such as ecological diversity, environmental protection, ozone layer depletion, climate change, use of natural resources, renewable resources and energy generation.

According to the ESD document (UNESCO, 2005), there are still some missing thematic issues, not covered in teaching curricula, such as in the area of social science: i) diversity and inclusion; ii) ethical guiding principles; iii) globalisation of economy and labour, leisure time; iv) demographic structures and developments; v) poverty and social security; vi) peace and conflict; vii) migration and integration; viii) political rule, democracy and human rights; ix) global governance and communication in the global context; x) illness and health as well as in the environment area such as: i) protection and use of natural resources and generation of energy; ii) opportunities and risks of technological progress; iii) food and agriculture; iii) mobility, urban development and traffic; iv) food and agriculture.

Thus, “Back to Nature” project and its concept is based on common needs and challenges in Romania, Hungary and Slovenia, therefore it develops new solutions, which are equally adaptable to specific needs of each partner country. In this case, sustainability means that the different programmes can simply and easily fit into school curricula, whether in form of indoor or outdoor learning activities. “Back to Nature” pedagogy and topics will cover issues, which have not yet being comprehend in existing curricula of partner countries, such as rainforest, health, sustainable consumption and production.

3 Biodiversity education - local/regional natural habitats and native species of Hungary, Slovenia and Romania

3.1 What does biodiversity mean?

The concept of biological diversity, also referred to as biodiversity has become part of the professional and social public awareness due to the increasing number of the signs of the ecological crisis in the past two decades. Its meaning is really wide: it describes the whole diversity of creatures.

Biodiversity means diversity interracial and interracial (genetic) diversity as well as the diversity of the ecosystems and habitats.

The reasons for decreasing biodiversity and the extinction of species are:

- ✓ increasing human population
- ✓ the natural habitats are divided, transformed and destroyed
- ✓ overuse
- ✓ poaching
- ✓ appearance of non-indigenous species and their proliferation
- ✓ modern biotechnology
- ✓ pollution
- ✓ climate change.

The Convention on Biological Diversity (Rio de Janeiro, 1992) that focuses on preventing biodiversity from further decrease and species from further destruction laid down the tasks in the most comprehensive way. The Convention on Biological Diversity records that the elements of flora and fauna must be preserved for the sake of preserving biodiversity and flora and fauna; their sustainable utilisation has to be guaranteed; the gains from their utilisation have to be allocated in a fair way, with special attention to their utilisation as genetic sources. The Convention declares that the preservation of biodiversity is the common cause of humankind, but each country has the right to exercise control over their flora and fauna.

Within 15 states of the EU – which had been members for a longer time – six biogeographical regions were assigned (Boreal, Continental, Alpine, Atlantic, Mediterranean, Macaronesian).

When Hungary joined the EU, the list of the regions was extended by adding the Pannonian region that covers the whole territory of Hungary.

3.2 Hungary

In the Pannonian biogeographical region, a lot of species and types of habitats (so-called Pannonicums) can be found which must be protected and do not appear in the territory of the states that has been members for a longer time. Hungary had to define these habitats on the basis of professional aspects by assigning the Natura 2000 areas.

The Carpathian Basin is the biggest natural biological "melting pot" of Europe. Different types of habitats can be found here like in a mosaic, which provides space for such diverse communities of creatures that are unique in Europe. It is also because there is no other area in Europe that is surrounded as closely by mountains as the Carpathian Basin. The central region stands out from this "melting pot", which is referred to as the "Pannonian region". The Pannonian biogeographical region has become one of the 11 independent units of Europe since 2004. Today, the Pannonian region is divided between 4 countries: Hungary, Romania, Slovakia and the Czech Republic.

The protected location of the region surrounded by mountains has had a significant influence on the local biological diversity and the climate. As the result of the complex weather conditions, the structure of the vegetation in the Pannonian region is like a mosaic instead of a more classic structure divided into zones, which can be found in the other biogeographical regions. The basin used to be covered by huge forests and wooded steppe, which were gradually destroyed and rough grazing areas were established on their location. The so-called "puszta" became one of the biggest cohesive grassy areas in Europe.

The other fundamental characteristic of the Pannonian region is water. The surrounding hills and mountains are important water sources for this dry territory. Thanks to the River Danube and River Tisza, the major part of the flat area was permeated by water, so shallow moors and lakes appeared for short periods. The hills surrounding the plain also significantly contribute to the already complex biological diversity: they have a fundamental impact on the distribution and migration of species. Over time, some of them have developed into a unique, local, that is, endemic species, that appears only in this region.

The level of species diversity is especially high in the Pannonian region. The region has outstanding importance from birdlife's point of view. In the habitats, covered in shallow water, thousands of geese, ducks and other waders gather every year. Rare species can be found among them, for example the lesser white-fronted goose or the common spoonbill.

Though the Pannonian region covers only 3% of the territory of the EU, it provides home for 118 animal species and 46 plant species that are listed in the Habitats Directive

(http://ec.europa.eu/environment/nature/info/pubs/docs/brochures/20years/hu.pdf or http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm) as well as for 70 bird species that are listed in the Birds Directive (http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm). These numbers do not only reflect the high biodiversity, but they also indicate the vulnerability and limited distribution of certain species. The following endemic plants belong to this group: the *Colchium arenarium,* the *Pulsatilla flavescens, P. hungarica,* the *Onosma tornensis,* the *Vipera ursinii rakosiensis,* the *Bythinella pannonica* and the *Mesoniscus graniger.*

The region is especially rich in invertebrate animals (stag beetle, *Morimus funereus, Cucujus cinnaberinus*). The number of fish and bat species is also significant. The latter ones choose the big underground caves as habitats, which are typical of the region. The region has an outstanding importance, especially from the birdlife's point of view. Many species breed here in significant number, which are considered to be endangered in the other parts of the EU, for example the bustard, the imperial eagle and the saker falcon.

The Pannonian sandy grasslands are the endemic habitats of the Pannonian region. The Danube and the Tisza River used to flood big areas of the plain. The sandy grasslands appear on the big quantity of sandy silt left behind. The sandy grasslands are exceptionally rich in plants and insects. The *Alkanna tinctoria*, the *Colchicum arenarium* and the rare *Dianthus diutinus* belong to the typical plant species. The characteristic animal species of the habitat are the *Acrida ungarica* (cone-headed grasshopper), the *Lacerta agilis* (sand lizard) and the *Spermophilus citellus* (European ground squirrel).

Every year in Hungary – by means of voting and involving experts – the tree, wild flower, mushroom, mammal, bird, reptile and insect of the year are chosen. In 2017, the goldfinch, the crab apple, the *Lucanus cervus* (a species of the stag beetle), the catfish, the moor frog, the hazel dormouse, the *Paralepista flaccid* and the snowdrop call the attention to the beauty of nature, biodiversity and the protection of that.

The **goldfinch** (Figure 1) is easy to recognize. It is impossible to be mistaken for another bird species, as it is one of the most colourful finch species of Europe. Apart from plains and hills, it breeds also in gardens, parks and on tree lines in the street. It is the regular guest of birdhouses and birdbaths. It makes a nest from thin vegetable fibres lined with fur on the edge of tree and higher bush canopies. It rears 2-3 broods a year and lays 4-5 eggs at a time. It feeds on tiny weed seeds and supplements the diet of its nestlings with bugs and worms. Its range is from Western Europe to Central Asia but it also nests in the northern part of Africa. The well-known and popular **goldfinch** may be considered as the ambassador

species of the struggle against logging that violates the animal protection act and the nature conservation act as it is carried out in the nesting period. The populations of the colourful little bird can be supported by providing birdbath throughout the year, feeding in winter and making nest materials available in spring and summer. The MME website (http://www.mme.hu/) contains further information on them.

Figure 1: The European goldfinch
(https://www.haziallat.hu/madar/diszmadarak/europai-tengelic-carduelis-carduelis/4428/)

The **crab apple tree** is the speciality of Hungarian forests. Nowadays human support is needed to preserve it in its natural habitats. Though in Hungary, it can find the right conditions of existence from the plain areas to the medium mountain zones. Owing to its rare and small populations that sometimes consist of only one plant, it is considered to be an endangered species. The tree, which reaches a height of 6-10 meter and the diameter of its trunk is 20-25 cm, attracts our attention especially in the second half of April, when its flowers bloom for only one week with a very strong scent, or when its fruits ripen (Figure 2). Its small fruits ripen in early autumn, their colour is greenish yellow and their taste is very harsh and their flesh is tough – they are especially preferred by deer and wild boars, but birds and small mammals eat them. The crab apple is in danger from several aspects – its seedlings and sprouts are damaged by wild animals, inbreeding is caused by the lack of mutual pollination, as the trees suitable for bearing fruit can often be found at big distances from each other. However, the crab apple has an important role in maintaining biodiversity in forests because its flowers are bee pastures. What is more, the crab apple is fully resistant to mildew, apple mosaic virus, scab and frost, so it may have an important role in the breeding for

resistance in the case of *Malus domestica*. Due to its climate tolerance, it may have a significant role as the propagating subject of the different *Malus domestica* species.

Figure 2: The fruit of the crab apple tree
(http://www.turistamagazin.hu/a-vadalmafa-lesz-a-kozeppontban-2017-ben.html)

Further information can be found about the crab apple on the website of the Országos Erdészeti Egyesület (National Forestry Association) (https://www.oee.hu/).

The ***Lucanus cervus*** (Figure 3) has a short life and is sexually dimorphic: the appearances of the male and the female are spectacularly different from each other. The well-developed male stag beetle cannot be mistaken for any other bugs living in Hungary due to its huge mandibles that resemble antlers. While the male's body length is 30-80 mm mandibles included, the female's body length is 25-50 mm as it has much smaller mandibles.

In Hungary, the animal appears in the oak forests of the mountains and hills, and also on wooded pastures with soil of high consistency, in parks and arboretums.
The developmental period for the larvae is 4-5 years, but the fully grown males live for only 4-5 weeks and die after mating.

The females live some days or even weeks longer than males. Out of the 1330 species of the stag beetle family 14 can be found in Europe, 7 species live in Central Europe and 6 species live in Hungary: apart from the *Lucanus cervus* the *Dorcus parallelipipedus*, the *Sinodendron cylindricum*, the *Aesalus scarabaeoides*, the *Platycerus caprea* and the *Platycerus caraboides*, whose appearance significantly differs from that of the *Lucanus cervus*. The *Lucanus cervus* is primarily endangered by the decline of its habitats, as it needs

old trees and logs for its development, since the number is significantly decreased by silviculture carried out for economic purposes. It is a Natura 2000 indicator species. It is protected and its intrinsic value is 10.000 HUF. More information can be found on the homepage of the Magyar Természettudományi Múzeum (Hungarian Natural History Museum) (http://www.nhmus.hu/).

Figure 3: *Lucanus cervus*
(https://en.wikipedia.org/wiki/Lucanus_cervus)

The **hazel dormouse** (Figure 4) has remarkably big black eyes. It is a small rodent. The animal's body length is barely 10 cm, its weight is 15-25 g, its fur is reddish-greyish yellow, its claws are cushion padded to help with gripping as it runs along the branches. Its big eyes refer to its nocturnal nature. It goes into hibernation period at the end of October, which lasts until April. The hazel dormouse is the inhabitant of the forests from the plains to the tree line. It also appears in scrubs and parks. It feeds on seeds, sprouts, berries and fruits of trees, but in early spring it also consumes insects and their larvae. It makes a spherical nest, it sticks to its habitat and it hibernates. It lives for about 4 years, but almost 70% of the young animals die.

The main reason for the decrease in number is that the animal's habitats are destroyed, its hibernation is disturbed, there are fluctuations in winter temperature or mild weather comes suddenly after very low temperatures.
At the same time, cats, foxes and wild boars kill the little animals. It is a protected animal in our country and its intrinsic value is 50.000 HUF.

Figure 4: Hazel dormouse
(https://www.youtube.com/watch?v=VsTUmEJ6PDw)

Our biggest fish is the **catfish** (*Silurus glanis*) (Figure 5), also named as Welsh catfish or sheatfish. It is popular because children get to know its characteristic huge mouth and long barbels from picture books. It has a long life and grows in its whole life.

One and a half centuries ago, some catfish weighing 200 kilograms were caught in our waters, but nowadays even the ones weighing 100 kilograms are really rare.

It gets its food on its preferred habitats, in the slow rivers and standing water, from small juvenile fish to ducklings swimming on the surface of the water.

It usually lays its eggs in June, mostly on the root tufts of the willows or on the bushes under the flood – the male carefully safeguards and protects the eggs. There is more information on the homepage of Magyar Haltani Társaság (http://haltanitarsasag.hu/index_hu.php).

Figure 5: Two giant catfish
(https://sokszinuvidek.24.hu/mozaik/2017/01/01/a-harcsa-lett-az-ev-hala-2017-ben/)

A conspicuous and poisonous mushroom is the bioluminescent *Omphalotus olearius* (Figure 6) can be found in groups on the foot of the trunks, logs and stumps or around them and has a funnel and a foxy red colour. Its colour can vary from bright orange through orange red to dark reddish brown and its centre is usually darker. At first, its top is more convex, but finally it becomes funnel-shaped and even bent. It appears in large numbers on rainy and warm summer day and in early autumn months. It also appears in dry weather and lasts long, as it does not age in 1-2 days, but it fades. This poisonous and emetic mushroom is often mistaken for the edible chanterelle. We can get more information on the homepage "Gombázó" (http://www.gombazo.hu/).

Figure 6: *Omphalotus olearius* (http://www.gombaportal.hu/modulok/gomba/egygomba.php?gid=31&nev=vil%C3%A1g%C3%ADt%C3%B3_t%C3%B6lcs%C3%A9rgomba)

One of our best-known flowers is the **snowdrop** (Figure 7) that can be found on many places in the hilly and mountainous areas of Hungary, but it is very rare in the Great Plain. The monocotyledon, bulbous perennial plant lives in humid woods, groves, scrubs and on adobe soil rich in nutrients. It is rare on its original habitat and diminishes. When the snow melts, it blooms on the first spring days even from February. That is why its name is "springtime" snowdrop (*Galanthus nivalis*) in Hungary. The snowdrop has been protected in the country since 2005 and it is forbidden to pick its bulbs and flowers. We can find further information about the snowdrop on the homepage of the Magyar Természettudományi Múzeum (Hungarian Natural History Museum) (http://www.nhmus.hu/).

Figure 7: Snowdrop

(http://ecolounge.hu/vadon/ezert-lett-vedett-noveny-a-hovirag)

The mass of sky-blue **moor frog** (Figure 8) males can be observed only for some weeks every year, but if we are at the right time at the right place, it is an unforgettable experience to see one of the most colourful and lively gathering of early spring.

The shy and hiding moor frogs are often difficult to find even on their habitats so their colourful mating is usually hidden from us. When the blue males are taken out of water, their original brown colour returns as they belong to the group of brown frogs. They prefer the wet, not too high habitats (e.g. the so-called Turjánvidék on the Great Plain, the moors of Szatmár-Bereg, the Small Balaton, the floodplain forests of Tisza and Dráva rivers). In their fully-grown form, they live on the land.

They hunt for invertebrate animals mainly at night, in rainy weather or in the vegetation that is wet from the morning dew. During the past years, the number of them has decreased due to draughts in spring.

Figure 8: Moor frog

(https://hu.wikipedia.org/wiki/Mocs%C3%A1ri_b%C3%A9ka)

3.3 Romania

Romania has a high biodiversity and a high diversity of habitats, being divided in 5 biogeographical regions: Pannonian, Alpine, Continental, Stepic and Pontic (at the Black Sea side).

The Alpine region has a special interest, Romania having 6% of the whole European Alpine biogeographical territory. The Alpine region from the Carpathian Mountains is fragile, with its species and populations being directly and indirectly influenced by changes in land-use practise, abandonment of small-scale agriculture, construction of transport networks and fragmentation of habitats. Mass tourism is both attracted to the region and its activity is damaging habitats and biotopes and may disturb wildlife species. The concept for sustainability of the Alpine region has for generations been multifunctional in terms of forestry and agriculture, human settlements and outdoor/leisure activities. Future conservation policies need to be spatially integrated and to reflect and support the long-term multi-functionality of the region. The high sensitivity of the region is stressed by IUCN special guidelines for managing mountain protected areas and the Convention on the Protection of the Carpathians (European Environmental Agency: Europe's biodiversity – biogeographical regions and seas).

The Alpine region in Romania offers habitat for many species and between them about 6000 of brown bears (*Ursus arctos arctos*) (Figure 9), one of the endangered large carnivores in Europe, Romania having approx. the half of the population of brown bear in Europe. The conflicts between the brown bear and the local population were rare in the past, because the large forests ensured a suitable habitat. In our days the forest exploitations reduce the habitat of the brown bear and the conflicts between the human population and brown bear are more and more frequent.

Figure 9: Eurasian brown bear (*Ursus arctos arctos*)

(https://en.wikipedia.org/wiki/Eurasian_brown_bear)

There are experiences to re-introduce the European bison (Figure 10) also. The European bison is the heaviest surviving wild land animal in Europe, the last exemplars in Romania being hunted in the middle of the nineteenth century. Now there are several hundred exemplars in natural reservations like in Hațeg reservation from the Retezat Mountains.

Figure 10: European bison

(https://en.wikipedia.org/wiki/European_bison)

Romania has some of the last virgin forests in Europe. The virgin forests of Romania have now been signed in the UNESCO World Heritage list. The forests of Izvoarele Nerei, Nerei-Beusnita gorges, Domogled- Valea Cernei in Caras Severin, Cozia mountain, Lotrisor in

Valcea, the secular forest Sinca in Brasov, the secular forest Slatioara in Suceava, Grosii Tiblesului and Strambu Baiut in Maramures County.

In history the Romanian natural forests had a surface of about 18 million ha. This covered not only Carpathian Mountains but also hills and lower plains. About 79% of the Romanian territory was covered by forests at that time. This forest landscape was documented over centuries. Influences of agriculture and later industry and local settlements had an impact on the forests. At the end of the 19th century, the percentage of deforestation decreased from 79 to 40%. Later 28% in 1948 and at present only 26.7% remains. That means under the European average of 33%.

Most of the virgin forests (45%) belong to *Fagus sylvatica* pure and mixed forests in mountain areas. These forests are located in the middle and lower parts of the Carpathian Mountains, mainly situated in south-western part of the country. These forests are very typical for the Carpathian Mountains in the Continental biogeographical zones of Europe. (http://www.mmediu.ro/app/webroot/uploads/files/2015-12-22_Virgin_forest_Romania_Summary.PDF)

One other very valuable habitat in Romania is the Danube Delta. The waters of the Danube, which flow into the Black Sea, form the largest and best preserved of Europe's deltas. The Danube delta hosts over 300 species of birds, as well as 45 freshwater fish species in its numerous lakes and marshes. The Danube Delta is Wold Heritage Site (https://whc.unesco.org/en/list/588).

At the end of a course of over 2,860 km, collecting the water from a vast hydrological basin that exceeds 8% of the area of Europe, the Danube (the second largest river of the Continent) has during the last 16,000 years built at its mouth with the Black Sea one of the most beautiful deltas in Europe, perhaps in the whole world. The Danube Delta is famous as one of the greatest wetlands of the earth. The wonderful natural habitats formed here offer good living conditions for an impressive number of plants and animals. Among these, reeds form one of the largest single expanses in the world, *Letea* and *Caraorman* forests represent the northern limit for two rare species of oak there are more frequently met in the south of the Italian and Balkan peninsulas. Together with the great number of aquatic and terrestrial plants, there are also many important colonies of pelicans and cormorans, which are characteristic of the Danube Delta, as well as a variety of other water birds which reside in or visit the delta for

breeding or wintering. The large number of fish is also notable, with species of both high economic and ecological value.

Many of the plant and animal species found in the delta are also important natural resources for economic use as food, building materials and medicines, they have attracted people to the area since ancient times. The human dwellings were chiefly based on the use of these natural resources, so developing traditional economic activities and characteristic cultural and social habits. Later, there was a tendency to overexploit some of these natural resources. (http://www.ddbra.ro/en/danube-delta-biosphere-reserve/danube-delta)

The Natura 2000 network is established in Romania and offer a framework for the protection of the biodiversity and the ecosystems. Natura 2000 is a network of protected areas in the territory of the European Union. It is made up of Areas of Special Conservation Interest (SCI) for the protection of listed habitats (Habitats Directive) and Special Protection Areas (SPA) for the protection of birds (Birds Directive).

Within Romania, 148 areas with a total surface of 3.7 million hectares are declared as SPA, and 383 areas with a total surface of 4.14 million hectares as SCI.

One of the most important Natura 2000 sites is Muntii Fagaras ROSCI0122 – 198,495 ha and Piemontul Fagaras ROSPA0098 – 71,256 ha, but both sides overlap and have a total size of 243,610 ha.

The Fagaras Mountains represent the highest mountain range of the Southern Romanian Carpathians and total almost 200,000 ha. They are designated as Natura 2000 site (both as SCI and as SPA) and include some of the most important areas of pristine forests in Europe.

The steep slopes, especially on the North side, have prevented development and preserved many important forest and alpine habitats. The Fagaras Mountains Natura 2000 sites host further a number of plants and animal species with the status of endemic, vulnerable or rare. With very few exceptions, the complete original flora and fauna is still present.

The Fagaras Mountains are covered by 27 localities from four counties. Forests and meadows cover over 70% of the area, unproductive rocks cover the rest. Private land-owners associations, city halls and private individuals are the main owners of the land, and forestry still represents a significant source of income for local communities. Thousands of sheep

andcattle are brought to the alpine grasslands to graze during the summer months. This, in fact, can locally represent problems for wildlife as diseases are often transferred from domestic livestock to wild ungulates, and direct competition for food creates problems for chamois and red deer as well. (https://www.carpathia.org/en/natura-2000-sites/)

The study HABITATELE DIN ROMANIA (Nicolae Doniţã, Aurel Popescu, Mihaela Paucã-Comãnescu, Simona Mihãilescu, Iovu Adrian Biriş: HABITATELE DIN ROMÂNIA, Editura Tehnicã SilvicãBucureşti, 2005) describe the most important habitats in Romania. In Romania, a number of 357 habitats belonging to 7 classes and 24 subclasses of PALAEARCTIC HABITATS classifying system have been described.

The habitats name has been given as a whole, using three characteristic elements for the natural habitats:

1) Land cover type (i.e. forests, scrubs, grasslands, communities of marshes, rocks, sand dunes or water bodies, etc).

2) Geographic domain where it occurs (i.e. South-East Carpathian, Dacian, Moldavian, Pannonic, Danubian, Westpontic, Pontic-Sarmatic, Balkanic)

3) Plant species characteristic to the habitat type.

Since there are not enough data about microbiological and fauna components of the ecosystems, the characterization of biocenoses has been done on the basis of flora that represent the very stable skeleton and main producers of ecosystems and determining the occurrence of consumers.

The high number of habitat types in Romania is due to climate conditions, geographically determined by the transition from Atlantic to continental climate, and also to the Carpathian range that influences significantly the climate according to altitude.

The diversity of substrata (from acidic to alkaline), of soils (from spodosoils to tcernosiom), of flora (about 3 868 species with a great variety of elements, from alpine to supra-Mediterranean, from atlantics to pontics) and of vegetation, is also high.

Many plant association and higher classification units that characterise the habitats, are specific to the Romanian territory. There are 11 alliances with more than 40 plant association characteristic to this territory. For instance, 19 plant association characteristic to the ponticand steppe bioregion and belonging to the Puccinelio-Salicornietea class, have been described in Romania only.

In Transylvania the specific cohabitation between nature and local communities created a special cultural landscape which has a great value from ecological point of view. The flower-

rich grasslands owe their survival to their intimate cultural, social and economic links to the villages. If these links are severed, the grasslands will be lost.
A typical village in the area has 200 families, of which most have 2-3 cows, and 10-20 sheep. The cows are milked at home morning and evening: the milk is used for home consumption, and the majority sold, often as the only source of cash income. Sheep are kept for milk, exclusively for cheese-making, and meat. Almost all villagers are therefore actively involved in agriculture. Each spring there is a village meeting, where the shepherds to be in charge of the village flock are chosen, according to their reputation and to the amount of cheese they offer to the owners for 'rent' of their sheep. The sheep are kept at one or two temporary summer sheepfolds, often several miles away from the village, during summer months. There are wolves and bears in the area, and generally every summer a few sheep and perhaps a donkey are killed: usually by old bears rather than wolves. The sheep are guarded by fierce sheepdogs. Sheep milking and cheese making is by hand, up in the summer sheepfolds. The unique richness of flowers and herbs in the grassland gives the cheese a special character. The cheese is transported down to the village by donkey or horse and cart once or twice a week. During the summer, most families are found out in their hay meadows, scythe or rake in hand, making hay for winter feed for their cattle and sheep. Winter heating and cooking is by wood-burning stoves, supplied by the coppiced beech and hornbeam forests on the hills that also supply materials for the many agricultural and household implements still made in the village. Thus, summer and winter, the villagers' lives are linked to the surrounding landscape. (http://www.fundatia-adept.org/?content=rural_culture)

Some characteristic species from Romania:

- **Țurkana sheep** (Figure 11) has adapted to the harsh weather conditions. It is the largest sheep in the racka group. Its wool is not as rough as the Hungarian racka, it is mixed with finer filaments, and its colour is almost white. Females wear sickle-shaped horns, but this is fairly short, and many sheep don't have horns.

Figure 11: Turkana sheep

(https://hu.pinterest.com/pin/447967494159859586/)

- The ***Fritillaria meleagris*** (Figure 12) has a chequered pattern in shades of purple, or is sometimes pure white. It flowers from March to May and grows 15–40 cm in height. The plant has a button-shaped bulb, about 2 cm in diameter, containing poisonous alkaloids. It grows in grasslands in damp soils and river meadows at altitudes up to 800 m.

Figure 12: Fritillaria meleagris

(https://www.farmergracy.co.uk/products/fritillaria-meleagris-bulbs-uk)

- ***Paeonia tenuifolia*** (Figure 13) is a hairless herbaceous perennial with a stem of 30–60 cm high, which are densely set with alternately arranged compound leaves. The lowest leaves are twice compounded or the leaflets are deeply divided into many fine linear segments, ½-6 mm wide, with a blunt to rounded tip, dark green above, and lighter glaucous green below.

Figure 13: Paeonia tenuifolia

(https://en.wikipedia.org/wiki/Paeonia_tenuifolia)

- **Fire salamanders** (Figure 14) live in central European forests and are more common in hilly areas. They prefer deciduous forests, since they like to hide in fallen leaves and around mossy tree trunks. Whether on land or in water, fire salamanders are inconspicuous. The diet of the fire salamander consists of various insects, spiders, earthworms and slugs, but they also occasionally eat newts and young frogs.

Figure 14: Fire salamander

(https://en.wikipedia.org/wiki/Fire_salamander)

- The ***Aquila pomarina*** (Figure 15) is about 60 cm (24 in) in length and with a wingspan of 150 cm. The lesser spotted eagle breeds in Central and Europe and south-eastward to Turkey and Armenia; and winters in Africa. This is a very wary species of open or lightly wooded country, in which it hunts small mammals and similar terrestrial prey. The biggest population from Europe breeds in Romania.

Figure 15: Lesser spotted eagle (*Aquila pomarina*)

(https://en.wikipedia.org/wiki/Lesser_spotted_eagle)

- The size of **Eurasian wolves** (Figure 16) is subject to geographic variation, with animals in Russia and Scandinavia being larger and bulkier than those residing in Western Europe. Adults from Russia measure 105–160 centimetres in length, 80–85 centimetres in shoulder height, and weigh on average 32–50 kilograms, with a

maximum weight of 69–80 kilograms. One wolf killed in Romania was recorded to have weighed 72 kilograms. In the Carpathian Mountains the wolf is still a common presence. (Wikipedia)

Figure 16: Eurasian wolf

(https://en.wikipedia.org/wiki/Eurasian_wolf)

3.4 Slovenia

Slovenia is situated in the southern part of central Europe, possessing four biogeographic regions as the Alps, Pannonian Plain, Dinaric Mountains and the Mediterranean.

The country's territory comprises 20,254 km2, with 40% covered by karst areas and 16% by quaternary sediments (CBD, 2018).

The diversity of abiotic factors such as climate, relief, altitude, geological and pedagogical structure has a strong impact on its great biodiversity. Much of the credit for the relatively well-preserved Slovene nature, should also go to the traditional farming in the past (UKOM, 2018).

Forests cover 1.2 million hectares or almost 60% of Slovenia's surface; 36% is agricultural land and 3.5% urban areas, while the remainder consists of wetlands, waters and areas with no vegetation cover. Landscape categories are extremely rich, comprising coastal and marine types, inland waters, scrub and grasslands, forests, marshes, rocky habitats and caves, as well as agricultural and urbanized landscapes. The principal characteristic of the landscapes is the intertwining of small units and their mosaic structure. Large areas of one habitat type are rare (CBD, 2018; https://www.climatechangepost.com/slovenia/biodiversity/;

Hlad B and Skoberne P, 2001; RSNC, 2018; http://www.slovenia.si/slovenia/country/nature-and-biodiversity/).

Slovenia as a country, exceptionally well preserves the biodiversity (http://www.slovenia.si/slovenia/country/nature-and-biodiversity/), possessing the Natura 2000 Network and many other protected national, regional and landscape parks. The protected areas under Nature conservation laws are approximately 10% of Slovenian territory. These are: Triglav National Park, three regional parks (Škocjan Caves, Kozjansko, Notranjska Park), over 40 nature parks (the best known among them being the Sečovlje Salina, Goričko, Logarska Valley, Strunjan, Lahinja, Boč, Zgornja Idrijca and Kolpa), 1 strict nature reserve, 52 nature reserves, and 1,185 nature monuments. Still waiting to be realized are the numerous proposals for the founding of regional parks (Karavanke-Kamniško-Savinjski, Kočevsko-Kolpa, Karst, Pohorje, Snežnik, Mura, Trnovski gozd) and nature parks (Drava, Ljubljansko barje).Slovenia also have three wetlands of global concern (Ramsar sites), i.e.: Sečovlje Salina, Škocjan Caves and Lake Cerknica, and 14,901 natural riches.

Let us also underline that nature outside protected area is of exceptional importance for a long-term conservation of animal and plant populations as well, considering that it constitutes corridors between separate protected areas and can function as a source of individual plants and animals for colonisation and re-population of the areas (UKOM, 2018). Of all the European Union Member States, Slovenia boasts the biggest share of Natura 2000 sites, as 37% of its territory is covered by Natura 2000.The Natura 2000 network already includes 25,000 areas and covers about 17% of the EU land territory (UKOM, 2018).

The first natural park in Slovenia was established in 1888 – the forests of Kočevje are the only preserved primeval woodland in Europe. The Triglav National Park (Figure 17) is the biggest Slovenian park.

Figure 17 : Triglav National Park is the biggest Slovenian park (https://www.slo-foto.net/galerija_slika-132411.html)

Valuable natural features in Slovenia also include the 7th world's deepest cave, the Čehi 2. The cave was discovered in1991 and is 1520 m deep and 5291 m long. The Čehi 2 cave entrance is situated on Rombonskipodi at an altitude of some 2000 m (https://en.wikipedia.org/wiki/List_of_deepest_caves#cite_note-Speologilor-3; http://www.conservationinstitute.org/10-deepest-caves-in-the-world/).

The Škocjan Caves are exceptional system of limestone caves comprises collapsed dolines, some 6 km of underground passages with a total depth of more than 200 m, many waterfalls and one of the largest known underground chambers. The site, located in the Kras region (literally meaning Karst), is one of the most famous in the world for the study of karstic phenomena (Figure 18). The Škocjan Caves were entered on UNESCO's list of world heritage sites on 28 November 1986. The Škocjan Caves are, above all, a natural phenomenon of global significance, ranking side by side with the Grand Canyon, the Great Barrier Reef, the Galapagos Islands, Mount Everest and others. (http://www.park-skocjanske-jame.si/en/information/certifications/#a_unesco; https://www.slovenia.info/en/places-to-go/attractions/unesco-world-heritage).

Figure 18: Terraces of precipitated calcium carbonate in Škocjan cave (https://travelslovenia.org/skocjan-caves-pictures/)

There are currently two such geoparks in Slovenia, which are involved actively in the European and global networks of geoparks: the cross-border Karavanke/Karawanken Geopark and the Idrija Geopark (https://www.slovenia.info/en/places-to-go/attractions/unesco-world-heritage).

To date, around 15,000 animal species, 6,000 plant species and 5,000 species of fungi have been identified and documented. The degree of endemism (ecological state of a species being unique to a defined geographic location) is considerably high. Among vascular plants, there are 40 endemic taxa, including 22 narrow endemics with predominant distribution in Slovenia. There are 850 endemic taxa of fauna, including cave animals above all. Approximately 10% of ferns and higher plants and 56% of vertebrates are endangered, including 64% of the 81 species of indigenous freshwater fish (https://www.cbd.int/countries/profile/default.shtml?country=si#facts).Threatened species of vertebrates in Slovenia are consisted of 36% of mammals (8 species at the global level), 49% of birds (4 species at the global level), 73% of amphibians (1 species at the global level), 48% of fishes and lampreys (4 species at the global level) and over 10% of vascular plants. All these species have been included on the national Red List. The major nature- endangering factors are agriculture, hydromelioration and construction of hydroelectric power plants, urbanisation and infrastructure, recreational activities, introduction of non-indigenous plant

and animal species, forestry, excessive exploitation of natural riches and pollution of the ground, air and waters (UKOM, 2018).

Slovenia is a habitat for more than 24000 animal species, while the most known breeds of indigenous domestic animals are presented below (https://www.myguidesloveniа.com/travel-articles/distinctive-animals-in-slovenia):

- **Lipizzaner** (Figure 19) is a Slovenian indigenous breed of elegant and noble horse. Horse can learn classical dressage as well as it can be used for drawing carriages or horseback riding. The horse also has a lively temperament and is easy to teach. In addition, this breed is healthy and has a long life expectancy. Probably one of the most interesting facts about the Lipizzaner however is, that the fouls are born black and they turn white as they grow into adulthood (https://www.myguidesloveniа.com/travel-articles/distinctive-animals-in-slovenia).
- The **olm** (Figure 20), also known as the proteus or the cave salamander. Olm is the largest cave-dwelling animal, which lives in the caves of Dinaric Karstand the only vertebrate in Europe that lives exclusively in subterranean areas. It is a blind amphibian and extremely well adapted to life in darkness. In Slovenia, the olm is under strict legal protection and has been listed as a rare and endangered species since 1982 (https://www.postojnska-jama.eu/en/come-and-visit-us/vivarium-proteus/).

Figure 19: The Lipizzaner

Figure 20: The olm or the proteus or the cave salamander

- The **Carniolan honey bee** (*Apismelliferacarnica*, Pollmann) (Figure 21) (https://en.wikipedia.org/wiki/Carniolan_honey_bee) is a subspecies of the western honey bee. The Carniolan honeybee is native to Slovenia, southern Austria, and parts

of Croatia, Bosnia and Herzegovina, Serbia, Hungary, Romania, and Bulgaria (https://en.wikipedia.org/wiki/Carniolan_honey_bee). Its basic characteristics include an excellent sense of orientation, diligence and gentleness. The climate and foraging conditions (cold, snowy winters, frequent rainy and windy summers)of the Slovene area give the available forage and thus the opportunity of establishment the bee species for centuries. One of Carniolan bee beneficial characteristics is its ability to locate honeydew flow much easier than other species of bees. It is therefore perfectly adapted to pasture on conifers. In addition, their well-developed hygienic behaviour makes them less prone to some diseases. In terms of these features, it is superior to all other species of bees (http://www.czs.si/wp/about/the-carniolan-bee/).

- The **"Soča trout"** (Figure 22: http://www.travel-slovenia.si/slovenian/soca-trout/)**,** is the marble trout fish, as named in Slovenia. In 1906, however, the non-native brown trout was introduced to the river Soča. By the close of the 20th century, it had become apparent that the marble trout was becoming increasingly rare in the Soča. It was not due overfishing that was to blame. It was interbreeding,because the marble trout and the brown trout could breed, and producehybrid offspring. The marble trout, which had once reigned in the river, had become endangered. The marble trout found itself on the IUCN Red List as an endangered species, and even the BBC produced a documentary on the uncertain future of Slovenia's endemic species (http://www.rtvslo.si/news-in-english/slovenia-revealed/a-unique-and-endangered-species-lives-in-the-soca-river/334577).Smaller trout stay in groups, while the larger fish are hermits and prefer to stay alone. Trout are especially recognisable by their distinctive marbled pattern on their back and head, and by their long, cylindrical body. Adult trout are predators and feed on other fish, but the smaller ones live on plants, insects and plankton (https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia).

Figure 21: Carniolan honey bee (*Apis mellifera carnica*, Pollmann)

Figure 22: Soča trout (*Salmo marmoratus)* in shallow water

- **Brown bears** are today one of the most vital and strongly numerically-increasing species with an expanding habitat in Slovenia. However, this was not always so. The brown bear was very common in Slovenia until 18th century. The reduction of woodlands, intensive agriculture, extensive hunting and the systematic human interference -all these drastically reduced the population of these large predator species. The number of bears declined the most in the level of areas suitable for farming. The management and protection of the brown bear population in Slovenia began in the 19th century. At the beginning of the twentieth century, there were only 30 to 40 brown bears in Slovenia. It was only in the second half of the previous century that their number increased, due to environmental management and orientation. It is estimated that there are currently 500 to 700 brown bears living in Slovenia. The brown bear can be most frequently found in fir and beech forests of higher Karst at an altitude from 400 to 1200 meters. The Slovenian Dinaric area is the westernmost part of brown bear habitat in Central Europe. The largest Slovenian species of the brown bear is found in the forests of the Kočevje, Bela krajina and Notranjska regions. In a 3000 km2 of dense forest the bear species survived due to appropriate natural environment and man's sympathy for this species (https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia; http://www.slovenia.si/visit/trails/brown-bear/).
- The **Ibex** (Figure 23: https://alpineibex.weebly.com/adaptations.html) is a mountain animal that typically inhabit open, rocky habitats at high altitude, above the tree line at an altitude of 1600-3200 m. In Slovenia it can be found in the Julian Alps, Kamnik-Savinja Alps and Karavanke. They migrate seasonally to different altitudes, spending the harsher winter months at medium elevations. Alpine Ibex is a strong, thickset and

shapely animal. Short, sturdy legs support the heavy body (1.5 m in length). Alpine Ibex are known to be excellent climbers and do not fear steep slopes; they can jump as high as 4 meters. Their predators include bears, wolves, foxes, golden eagles, and humans, but are not threatened by any predator in Slovenia. The animal was almost extinct but the group of scientists managed to curb decreasing numbers several years ago (https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia; http://www.slovenia-hunting.com/language/en/alpine-ibex/; https://en.wikipedia.org/wiki/Alpine_ibex).

- The **golden eagle** (Figure 24: https://en.wikipedia.org/wiki/Golden_eagle) is the Slovenia's largest bird, and one of the symbols of the Slovenian Alps. Despite their dominance in the natural world, golden eagles were almost brought to the extinction. At a time before hunting was restricted, the eagles were considered as a prize game bird, and their numbers began to decline precipitously throughout Europe. In the 20th century, the habitat loss due to the expansion of settlements and industry further reduced their numbers, as did the use of DDT-based insecticides in the postwar era. When it became increasingly clear that the future of the golden eagle in Slovenia was under threat, authorities declared it an endangered species. The killing of golden eagles became punishable by high fines or even possible prison sentences. Between 20 and 30 pairs of the eagles are now estimated to live in Slovenia, with a habitat ranging from the Adriatic hinterland to the rocky peaks of the Alps. However, a new threat to the golden eagle population has emerged in the form of electricity-producing wind turbines. The species is known to be particularly vulnerable to the destructive force of the turbines' blades, and when a new turbine was built at Volovja Reber in Slovenia's Karst region, environmentalists raised their concerns. So far, no golden eagle deaths in Slovenia have been attributed to wind turbines, but since the lifespan of a golden eagle can be as long as 30 years, wind turbines could cause lasting damage to the recovering golden eagle population in the country (https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia; http://www.rtvslo.si/news-in-english/slovenia-revealed/the-golden-eagle-still-soars-above-slovenia/347054).

Figure 23: Alpine ibex (*Capra ibex*)

Figure 24: Golden eagle (*Aquila chrysaetos*) the Slovenia's largest bird and symbols of the SlovenianAlps

- **Krškopolje (Black belted) pig** (Figure 25: http://www.rtvslo.si/news-in-english/krskopolje-pig-the-only-indigenous-pig-breed-in-slovenia/348351) is the only one indigenous pig breed that has been preserved in Slovenia. It was mentioned in records as early as in 1851. 120 years later, they started systematically exterminating it, but 20 years later, the breed experienced a revival. Since 1993, their numbers have been on the rise ever since, mainly because an increasing number of people have become aware of the breed's advantages – they produce high-quality meat at economic rates (https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia;http://www.rtvslo.si/news-in-english/krskopolje-pig-the-only-indigenous-pig-breed-in-slovenia/348351; https://fundus-agricultura.wiki/wp-content/uploads/krskopolje_pig.pdf)
- The **Karst Shepherd** (Figure 26: http://www.kinoloska.si/kraski-ovcar) is a breed of dog of the livestock guardian type, originating in Slovenia. The Fédération Cynologique Internationalerecognizes this Mountain dog as a breed. The dog is of medium size, harmonious, robust and endowed with a well-developed musculature and a strong constitution. The tail and ears are hanging. It is having a sharp temperament and strong individuality, distrustful of strangers. It is a good guard dog. The Karst Shepherd is named after the Karst Plateau in Slovenia and Italy, and more generally after the Karst landscape that extends to Croatia and partly in Bosnia and Herzegovina, from the Gulf of Trieste to the Dinaric Alps. Mostly bred in Slovenia and Istria in Croatia (https://en.wikipedia.org/wiki/Karst_Shepherd).

Figure 25: The Krškopolje (Blackbelted) pigas the only indigenous pig breed preserved in Slovenia

Figure 26: Karst Shepherd – a dog originating from Karst Plateau in Slovenia

4 Basic principles of sustainability

4.1 Sustainable learning

What is the sustainability? What does sustainable development mean? What does sustainable learning mean? Why is it important and how to be sustainable and eco-conscious?

The human society development faced important challenges in the modern industrial era. The development of the technologies makes able the human society to change dramatically the natural environment. The intensive exploitation of the natural resources and the increased use of the energy caused a high pressure to the natural systems. The main consequences of the pressure to the natural environment are the loss of the biodiversity and the loss of the eco system services. The actual development trends are focusing to the growing, to the permanent increasing of the production of the food and the material goods. This is parallel with the trend of the increasing of the global population. The result of the actual development trend is a development, which is unsustainable. We can conclude this because if this trend will continue, according to the scientific forecasts, the global climate system will be radically changed and the eco system services will collapse.

The first alarm signals are originally from the seventies, when from the official side and as well from the civil society side, were initiatives to stop this unsustainable development trends.

In 1971 the UNESCO's Man and the Biosphere Programme (MAB) was launched, which is an Intergovernmental Scientific Programme that aims to establish a scientific basis for the

improvement of relationships between people and their environments.MAB combines the natural and social sciences, economics and education, to improve human livelihoods and the equitable sharing of benefits, and to safeguard natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable.

In 1972, the book "The Limits to Growth" was published by the Club of Rome (Donella H. Meadows, Dennis L. Meadows, Jørgen Randers, and William W. Behrens: The Limits to GrowthPotomac Associates - Universe Books, 1972) which is about the computer simulation of exponential economic and population growth with finite resource supplies. This was the first strong signal, which shows that the actual development model is unsustainable.

In 1983, the United Nations Secretary-General invited Norwegian prime minister Gro Harlem Brundtland to chair a World Commission on Environment and Development. Concern about the acute pressure of population growth, modern technology and consumer demand on the planetary fabric had been smouldering away since the 1970s. Now, a new generation of environmental worries - global warming, deforestation, species loss, toxic wastes - had begun to capture scientific and popular attention. The world's natural resources were being rapidly depleted, often in the name of development, but the poverty, this development was supposed to correct, was as widespread as ever. As result, the document "Our Common Future", also known as the "Brundtland Report", from the United Nations World Commission on Environment and Development (WCED) was published in 1987 (Brundtland Commission: Our Common Future, Oxford University Press, 1987).

Its targets were multilateralism and interdependence of nations in the search for a sustainable development path. The report sought to recapture the spirit of the Stockholm Conference - which had introduced environmental concerns to the formal political development sphere. The document stated, for first time, that the only way of development is the sustainable development and "Our Common Future" placed environmental issues firmly on the political agenda; it aimed to discuss the environment and development as one single issue.

According the sustainable development concept, we need a development, which satisfy the needs of the actual generation without to endanger the chance of the future generations to satisfy their needs.

Build on the Principles agreed upon under Resolution A/RES/66/288, popularly known as "The Future We Want" (https://sustainabledevelopment.un.org/futurewewant.html)

it was elaborated a non-binding document, released as a result of Rio+20 Conference, held in 2012 in Rio de Janeiro in Brazil, called the Sustainable Development Goals.

The Sustainable Development Goals (SDGs), officially known as “Transforming our world: the 2030 Agenda for Sustainable Development” is a set of 17 "Global Goals" with 169 targets between them. Spearheaded by the United Nations through a deliberative process involving its 193 Member States, as well as global civil society, the goals are contained in paragraph 54 United Nations Resolution A/RES/70/1 of 25 September 2015.

This time the implementation of these goals is necessary according to the often-quoted assertion by United Nations Secretary-General Ban Ki-moon that "we don’t have plan B because there is no planet B".

The principles and the ways of implementation of the sustainable development has to be learned at the school in the formal education system. It is difficult for the young generations to face the new challenges, with the knowledge and educational approaches from the past era. The temptations from the consumer’s society keep the children captive in the front of computers and other devices and they are captive in a virtual world and are disconnected from the natural systems, which is very dangerous.

The most important changes in the educational systems has to be to - the re-connect the educational systems to the real world, to prepare the students to face the problems caused by the consumer’s way of life and to reshape the value system which lead the young generation. ***They have to be aware that if they will continue the way of life of the previous generation they cannot stop the negative tendencies and they miss the last chance to stop the irreversible changes in the climate system and in the degradation of the eco system services.***

The first steps to reconnect the young generation to the nature were made in 90’s with the methods called “Environmental Education (EE)”. These method’s started from the presumption that the ***young generation*** (from an already urbanised world) ***don’t have a natural experience and if they will have this experience they will have more respect for nature, so in consequences they need to have a natural experience and then they will change their way of life.*** However, after several years of experience the needed changes did not arrive, therefore new ways in education were explored.

The new tendencies in the education intend to create an education for the sustainable development (ESD) and to promote the outdoor activities, which re-connect the children to the natural systems. *The methodologies of the ESD focus on teaching the students the*

sustainable economy practices (how to recycle the paper or other materials, how function the green and the blue economy, etc.), and most of the activities are outdoor activities.

The students have to learn that the discussions about the climate change are not academic discussions without consequences to their life, but are daily business questions which have to make them to think about their life style and about their responsibility in the preservation of the actual ecologic and social systems.

The sustainability of the human life in the planet Earth depends in the future on the cooperation between the human and natural systems. The technologies invented by the humans are able, for first time in the history, to influence the ecological system on global level.

The ecological disasters in the past resulted due local disasters (desertification due to the irrigations, etc.), and the population moved from that territory.

In our days, this is not possible in the case of a global disaster, so the human society has to learn to care about the ecological systems and to adapt the needs to the limits of the ecological system.

The chance of the human society to survive is to change the way of life to an eco-conscious way of life at the level of the individuals and as well at the level of the communities. This can happened only if a social consensus does exist in the society, because in the actual system, the politicians try to answer the needs of the population and the population learned (and experienced) that the development is linked to the economical growing, so they want to have development and they provoke the politicians to elaborate such development strategies. But if it is possible to have a consensus at the level of communities concerning the development strategies, which are based on a sustainable development, if the quantitative growing is changed to a qualitative improvement in the life of the individuals and in the life of the community, it is possible to achieve a sustainable development. The last 30 years of experience proved that any strategy, which is based on limitations in the framework of the consumer's society value system, has very low chance to success. Therefore, any real expectation to build a sustainable community has to be based on an eco-conscious social pact, which is the result of an **eco-conscious education**.

4.2 Sustainable consumption

Which are the sustainable challenges? E.g. climate change, famine, environment pollution

At the beginning of the 21th century the human society face very complex challenges, which are originally on the consumption patterns of the modern society. The actual technical systems, which make the actual society functional, cause important environmental problems.

The global warming and the climate change, the reduction of the natural habitats and the pollution of the natural environment, are important consequences of the modern lifestyle, a price, which will be paid by the future generations. The most important systems, which cause major problems and which have to be changed very quickly, are:

- Transport system, mobility: The need for mobility of the modern society is enormous and the actual transport system is deeply unsustainable. The daily travel from the home to the work in the cities and outside of the cities, need a huge infrastructure, especially if the travels are made by cars.

  The roads and highways occupy bigger and bigger surfaces and the construction of new roads attract more cars, the process looks endless. The fragmentation of the biotopes and the occupation of the fertile soils by the transport systems, are ongoing processes with irreversible consequences. In Europe, the cars are responsible for around 12% of total EU emissions of carbon dioxide (CO_2), the main greenhouse gas. It is a need for change in the all concept within the transport systems. By 2021, phased in from 2020, the fleet average to be achieved by all new cars is 95 grams of CO_2 per kilometer. This means a fuel consumption of around 4.1 /100 km of petrol or 3.6 l/100 km of diesel. The 2021 target represent reductions with 40% compared with the 2007 fleet average of 158.7g/km. This is what concerns the technologic development, but it is a need to reduce the travel distances and also the ways of travel. The alternative ways of travel, by bicycle and the more functional public transport is crucial.
- Food production: Actually, it is a big inequality in the world concerning the food production and food distribution. In the rich part of the world there is overproduction of food that is important, as well as quantities of food waste of that are also important. It is a need to reduce the waste of food and to have a more rational relation to the food. The size of the farms is increasing continuously and the agriculture transforms the rural space in an agro-industrial area. It is a need to re-transform the rural space in a multifunctional space,

a space for preservation of the biodiversity, and for the other functions for humans (for example recreational areas), and as place for production of the food.

- Occupation of territory: The urbanization process is an intensive ongoing process, which cause the occupation of the territory and the reduction of the territory, occupied by the natural systems.

The reduction of the habitat of the different species causes the endangering of several species. In Europe, there were several attempts to stop the loss of the number of the endangered species, but until now, these attempts were not successful. Together with the occupation of the territory, the ecosystem services offered by the natural systems would be lost.

4.2.1 What does sustainable community mean?

The globalization and the strong urbanization process have a major effect to the traditional communities and cause severe social problems: the traditional issue of the communities is destroyed; the people are more and more dependents on services especially on the social services. The society has a technical development and a social development.

If the technical development is more forward to the social development, the community loss their sustainability, the social equity is lost also and the balance, which sustain the structure of a livable community, it is destroyed. The urban communities to follow a sustainable path need a careful and participative planning process, which seek to have a balance between the social, environmental and economical challenges. According to a definition: “A sustainable community is one that is economically, environmentally, and socially healthy and resilient.” It meets challenges through integrated solutions rather than through fragmented approaches that meet one of those goals at the expense of the others. In addition, it takes a long-term perspective – one that is focused on both the present and future, well beyond the next budget or election cycle. (http://www.iscvt.org/impact/definition-sustainable-community).

In the case of the rural communities, the process of losing the sustainability of the communities is an ongoing process in our days. In these communities, the urbanization process with all the social problems and the industrialization of the agriculture, isa very sensitive and dangerous process.

The Aalborg Charter established the guidelines for the local sustainable communities in Europe. The **Charter of European Sustainable Cities and Towns Towards Sustainability,** otherwise known as the **Aalborg Charter**

(http://www.sustainablecities.eu/the-aalborg-charter/ 1994), is an environment sustainability initiative, approved by the participants at the first European Conference on Sustainable Cities & Towns in Aalborg, Denmark. It is inspired by the Rio Earth Summit's Local Agenda 21 plan, and was developed to contribute to the European Union's Environmental Action Programme, 'Towards Sustainability'.

The Charter is based on the consensus of the different stakeholders (the individuals, municipalities, NGOs, national and international organizations, and scientific bodies) involved in the development of a city concerning the sustainable lifestyle. According to the consensus, all development projects of the city will follow the principles of the sustainability.

In the rural areas the communities are still closer to a sustainable lifestyle as the cities.

The sustainable lifestyle in the traditional rural communities has 3 main pillars:

- High level of autonomy from the big supplying systems. This autonomy refers mainly to the food, water and energy.
- Way of life close to the nature. The agricultural production systems are in collaboration with the natural systems and with the ecosystem services.
- Active social life. The members of the community cares for each other and the members on need are receiving support from the community.

The reconstruction of the sustainable rural communities is of a high priority in the future because these communities maintain the European landscape with a high diversity (cultural diversity and biodiversity) and the ecosystem services.

The sustainable communities are focusing on the social equity and on the healthy environment, and there are all over the world - the communities, which decide to have a sustainable way of life. One of the most well-known examples is the town of Totnes for UK. (https://www.transitiontowntotnes.org/)

4.2.2 What does sustainable water consumption mean?

The water is one of the most important natural resources, and looks that is an unlimited resource, but in fact, it is not. The majority of human usages require fresh water, but 97% of the water on the Earth is salt water and only three percent is fresh water; slightly over two thirds of this is frozen in glaciers and polar ice caps. The remaining unfrozen fresh water

is found mainly as groundwater, with only a small fraction, present above ground or in the air. Globally, more than one billion people have no access to clean drinking water.

In 25 years, up to 6 billion people will be experiencing water shortages because of poor hygiene. Even Europe's natural water resources are being put under ever-increasing stress. Water stress arises, when the amount of water used exceeds availability. In Austria, only 3% of the total renewable water supply is extracted annually, but some countries like Bulgaria and Belgium, for example, suffer from water stress, because they consume 55% and 41% respectively, per annum of the renewable water supply. Therefore, the relation right now between the water and the human society is unsustainable.

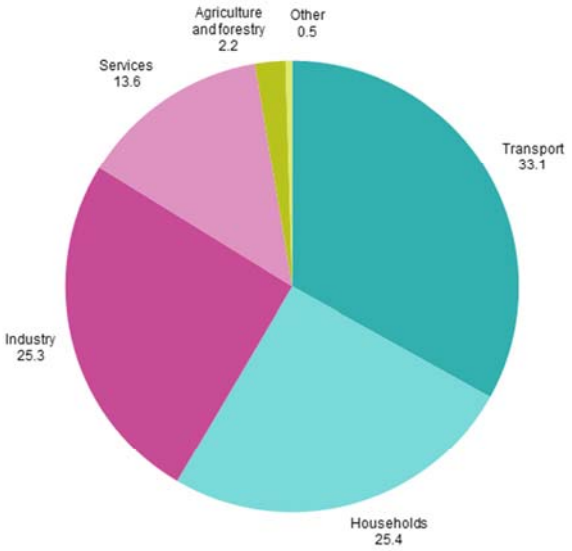
This attitude has to be changed and in EU, theWater Framework Directive (WFD), which commits European Union member states, to achieve good qualitative and quantitative status of all water bodies, regulates the sustainable water policy and water management. The WFD establish that the water is not a commercial good, but is the support of the ecosystems and has to be considered as well. The WFD establish also that the water management has to be done with the involvement of the public.

The sustainable water management aims to maintain the ecosystems linked to the water (lakes, rivers, wetlands) in good ecological status and benefit the ecosystem services. We have waters around, us but we are drinking bottled water, which need a lot of energy to be bottled and transported. In the future, a responsible attitude toward the water is to avoid the water regulation works and maintain the healthy status of the ecosystems.

The water management is the responsibility of the local communities and the local authorities, while the public has to be involved in the water management issues, because only in this way a sustainable water management can be achieved. In the past, the biggest fear of the communities concerning the water was the flood, so in consequences the water management was focusing to the flood protection. In our days, in the conditions of the climate change, the biggest problem is the water shortage and the extreme situations. To provide the drinking water from long distances is not sustainable in long term, so each community is responsible for his water supply in the future, this responsibility cannot be delegated anymore to multinational, big companies.

4.2.3. What does sustainable energy consumption mean?

The energy consumption patterns are changing. In our days in Europe, energy is used for households as well for the industry (according to the Eurostat: online data code: nrg_100a, Figure 27). In the households a lot of different machines (from refrigerator to microwaves), which need electricity, are used.



Note: figures do not sum to 100.0 % due to rounding.
Source: Eurostat (online data code: nrg_100a)

Figure 27: Energy use of the different sectors (Eurostat: online data code: nrg_100a)

The houses are, in many cases, much bigger as it is needed and in winter time the heating of the house needs a lot of energy. Most of the people are thinking that they can afford the cost, but it is necessary in the future, to think to the consequences of the energy use to the ecosystem.

Another important component in the energy use, which depends on any single citizen, is the mobility (transport). When we plan our travel, we have to be conscious about this. The households and the transport represent together almost 60 % of the energy use in Europe.

Therefore, the responsible and sustainable energy use has two aspects:

- Reduction of the energy use: Each citizen can do many things in this respect if everybody evaluates the real needs concerning the consume volume in the households and in the transport. Do we need to heat all the rooms during the winter? Do we need to have lighting in the house to look as it is daylight? Do we have to go with car even for short distances? If we have the alternative to go by bike or by public transport, why do not we use these possibilities?
- Increasing the energy efficiency: The EU proposed to increase the energy efficiency by 20 % until 2020. In this respect, each citizen has his own responsibility, when purchase machines which use energy. In the shops, every machine has an indication concerning the energy efficiency (Figure 28), it is important to take in consideration this indication.

Figure 28: Energy Efficient Appliances label (Housing Energy Advisor)

The production of the energy is disturbing the ecological system in many ways. If the source of energy is from fossil resources, the emission of CO_2 causes climate changes and global warming. If the source of energy is from water, we have to know that the dams form the hydro power stations are disturbing very seriously the river's eco system. The nuclear energy holds very serious risks during the operation and during the deposit of the nuclear fuel after the use. The clean energy is coming from the sun. In the energy production, it is important to use renewable energy resources and every single citizen can make benefit from the sun energy for heating the water or producing the electricity.

The distribution of the different energy sources in EU can be seen below (Figure 29).

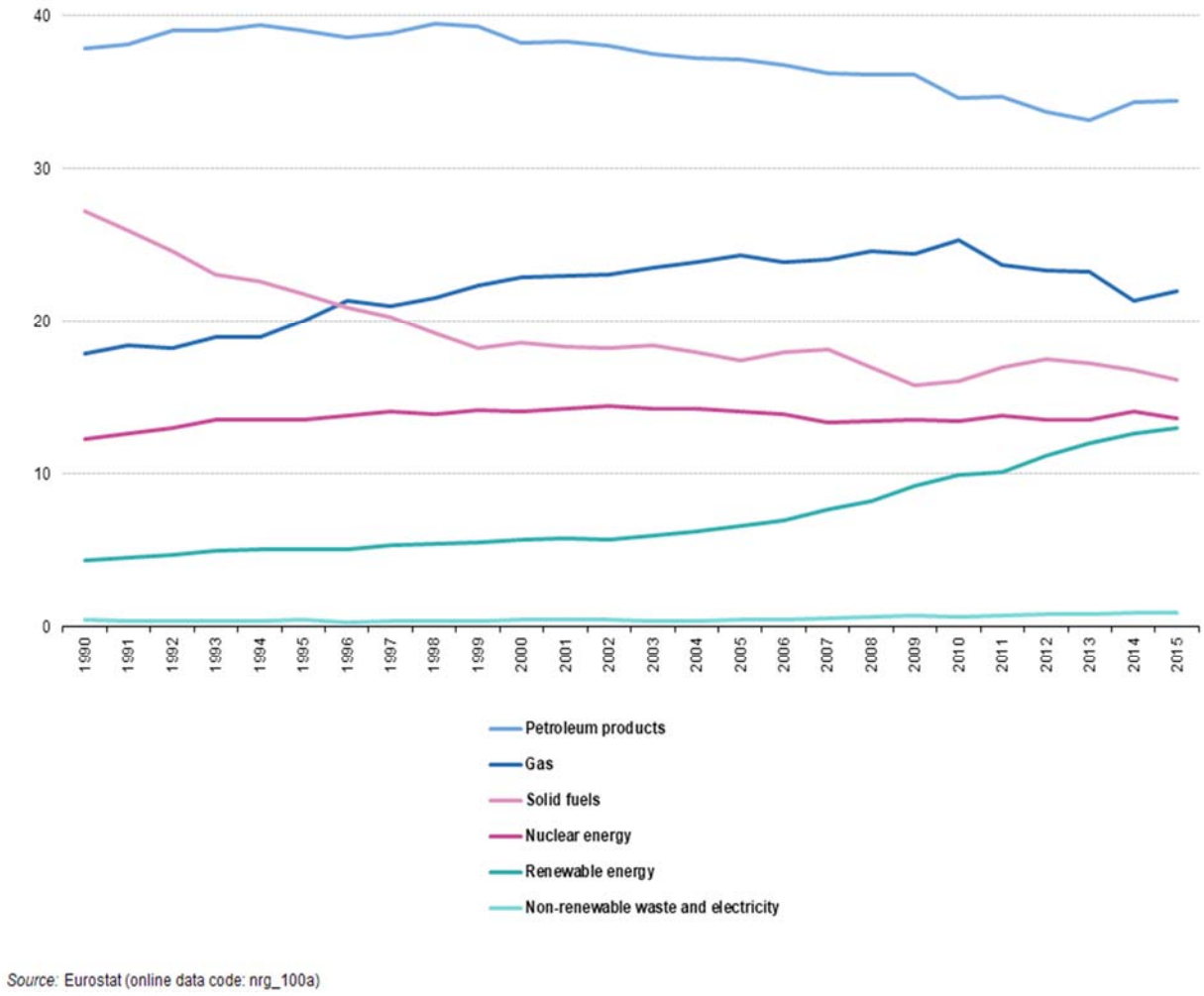


Figure 29: Energy sources in EU (Eurostat online data code:nrg_100a)

The renewable energy producing is increasing and the EU goal is to have 20% of the energy use from renewable sources until 2020. The renewable energy is considered to be as (http://www.renewableenergyworld.com):

- solar energy,
- wind energy,
- hydro energy,
- bio(mass) energy,
- hydrogen,
- geothermal energy and
- ocean's energy

4.2.4. What does healthy lifestyle mean?

One of the biggest problems of the future generation will be to afford the siren's voice of the consumer society. The consumer's society changed the alimentation patterns and the lifestyle became a sedentary one. The ancestral fear of the humanity of hunger generated a mass production of food, which is satisfactory from quantitative, but it is very poor from qualitative point of view. The distribution of the food is not balanced in the world so still in our days, many people suffer from hunger, but in Europe, most of the people suffer from "qualitative hunger" concerning the food. The vegetables produced by new technologies (hydroponic, hybrids, genetically modified organism - GMO) do not have the same quantity of vitamins and essential microelements, as the vegetables cultivated in soil. The biggest part of the food consumed in the developed countries is rich in calories and the big part of the population became overweight.

The consumption patterns of the young generation, the so-called "trends", promote the fast food and the food called "junk food", which is not at all healthy, it is rich in calories and poor in vitamins.

For the healthy lifestyle, everybody has to make a little effort, a change concerning the:

- Food patterns
- The patterns concerning the transport, recreation, free time

All over Europe, the systems are created, which makes a direct connection between the small farmers and the consumers (https://en.wikipedia.org/wiki/Short_food_supply_chains). The healthy food can be provided from the small farmers, the food produced on small scale is more under our control, the farmers who are members of a short food supply chain are in permanent relation with the customers.

It is recommendable to provide our food via a short food supply chain and in this case we can work together with the farmer. This kind of work can be considered as a kind of "peasant fitness", and the one who is participating, can get his own healthy food as well could spend some time on fresh air. It is a new trend, which supports the healthy lifestyle to produce our own vegetables. In the countryside, it is only a question of willingness, but in the towns where there is less land, more effort is needed. The urban gardening is very popular in many towns, aiming at developing a community feeling and resulting in healthy food. In addition, the alimentation patterns have to be changed, the healthy lifestyle supposes a balanced alimentation, to eat more fruits and vegetables and less sugar and food rich in calories.

The actual transport patterns have to be reconsidered, it is not needed to travel even short distances by car, the cycling or the march could be a part of the healthy lifestyle.
In the free time, instead of watching TV, or staying in the front of the computer, it is recommended to spend this time in a natural environment. The sport or the hobbies in the nature have a major contribution to the healthy lifestyle.

4.3 Sustainable future planning

What can we do for our future?

To have a sustainable future, we as human community, have to make radical changes in our consumption patterns, and to make a common effort to reduce the overexploitation of the natural resources, to reduce the loss of biodiversity (the actual period called Anthropocene is the period of the 6th mass extinction), the loss of the ecosystem services and to reduce the emission of the greenhouse effect gases.

In this respect the UN fixed the Sustainable Development Goals (http://www.un.org/sustainabledevelopment/sustainable-development-goals/) and elaborated the **Agenda 2030** (https://www.un.org/pga/wp-content/uploads/sites/3/2015/08/120815_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf).
Between the 17 main goals (Figure 30) which are considered essential for the development of the human society in the next period, 7 are referring directly to the environmental conditions. The realization of some of these goals like goal 6 (Clean water and sanitation) are directly conditioning other goals like the goal 3 (Good health and wellbeing).

Source: https://childfinanceinternational.org/initiatives/sustainable-development-goals.html

Figure 30: The 17 Sustainable Development Goals
(https://sustainabledevelopment.un.org/?menu=1300)

The big challenge is to implement these goals, which are scientifically proved as necessary. For the implementation of these goals and other plans, which lead to the sustainability, there is a necessary to have a general social pact. All the people have to understand the necessity to act in responsible way for the future generations. The protection of the environment is not anymore the responsibility of the environmentalists, but the responsibility of the whole society. On individual level, everybody has to reconsider the personal consumption patterns. If the checked ecological footprint (there are several calculators on the internet, for example: http://greencred.me) is bigger as it is allowed, than something has to be changed to reduce the ecological footprint.

On individual level, can be done many things:

- Buy food from local producers, in this way you will reduce the CO2 emission from the transport and will support the local economy
- Travel by public transport, by bike or on foot, use the car as less is possible
- When you buy something, avoid the large quantities of packaging materials
- Save the water, drink tape water, which is the same quality in most of the cases as the bottled water

- Try to reduce the use of energy, by avoiding unnecessary energy use and by purchasing energy efficient machines
- Spend as much possible time in nature and take attitude if you see that someone destroy the nature

On the level of the communities, it is recommended for each town or village to join the EU networks, which promote the sustainability: for example the Covenant of Mayors (http://www.covenantofmayors.eu) or ICLEI (http://www.iclei.org) or Climate Alliance (*www.climatealliance.org*). Alternatively, if it is a community who want to do even more, there are towns which made a lot of steps toward a transition from the unsustainable development to a sustainable development like the towns from the Transition Network (https://transitionnetwork.org).

The actual society is so complex that if we would like to provoke any changes, we need a careful planning process. In this respect, there are several methodologies elaborated, like the SEAP (Sustainable Energy Action Plan) (https://www.covenantofmayors.eu/IMG/pdf/SEAP-ENG-final.pdf).

If a town became the member of the Covenant of Mayors, the SEAP has the chance to receive funds from the EU to implement some projects.

The decentralization of the big supply systems concerning the energy, water and the food, will help in the future the local communities to be more resilient in the conditions of the climate change.

Since the 90's, when the first step toward to build a sustainable society was made, we have the knowledge based on scientific data concerning the need for action, but we learned on these years that if the humanity will keep the same value system concerning the consumption patterns (consumerism society values), it is hard to expect any changes. Therefore, it is the time to change our value system to switch from the quantitative accumulation in our life to qualitative achievements.

4.4 Sustainable ethics

Ethics can be defined as reflection on the nature and definition of "the good."Ethical concerns are implicit in the term sustainability, as sustainability means taking into account not just utility, the usefulness of something, but also moral values and goals.

Ethics, in general, explores problems of good and evil, thus there exist countless ways to specify what this means, according to diverse interests and perspectives.

There are three ways to be discussed: 1) Sustainability relation to tradition, 2) Ethical concerns in sustainable decision-making, and 3) Characteristics and principles on ethic sustainability (WCED, 1987).

4.4.1 Sustainability relation to tradition

Without knowing how some of the most important ethical theories have emerged and which thinkers have defined them, as well as what theoretical and practical issues have divided them different, it is impossible to understand what an ethic of sustainability might look like. Therefore, some theories, as presented in Figure 31, are discussed below (Kibert C J. et al, 2012):

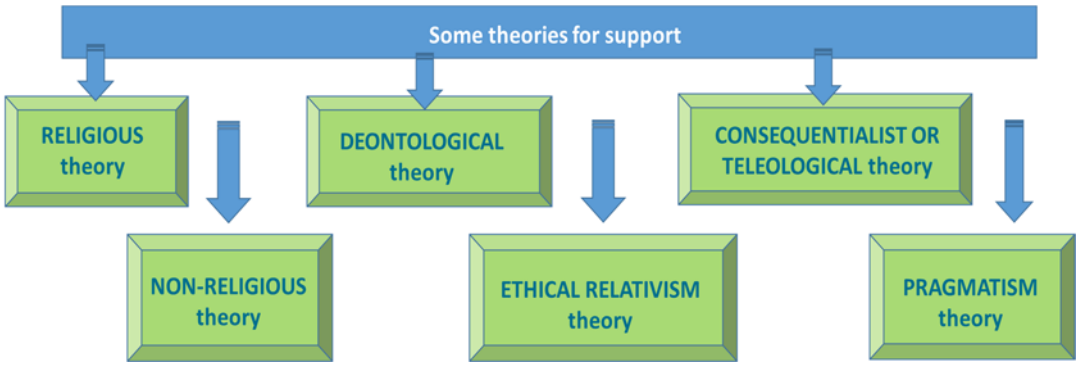


Figure 31: Different ways of thinking about ethics, both philosophical and religious, thus helping people to solve complex issues and make more sustainable choices

Theories related to tradition

a) Religious theory (Kibert C J. et al, 2012): Probably the earliest, and still the most prevalent way of thinking about values, is religious. Many discussions of sustainability do not refer to religion explicitly, but rather define the problems of sustainability only in relation to technical, economic, or otherwise secular concerns. A stewardship ethic begins with the premise that *God* has created the natural world for the benefit of all people. Humans are not the owners of this world, but are rather the caretakers who have - both special responsibilities and some special privileges, with regard to created goods.

A wide range of religious groups have issued statements on the environment, some of them very general, such as Pope John Paul II's calls for "ecological conversion" and he named the Francis of Assisi as the "Patron Saint of Ecology."

Non-religious theory (Kibert C J. et al, 2012): A non-religious wayof efforts for sustainable, is strongly influenced by philosophical ethics, i.e. by classical Greek thinkers, especially Plato and Aristotle. One of the most important classical philosophical themes for sustainability is justice, as discussed by Aristotle. For Aristotle, justice is both i) procedural as – concerned with fairness in decision-making and other social processes– and ii) substantive as – concerned with the proper distribution of actual goods.

b) Deontological theory (Keeley F. 2012; Kibert C J. et al, 2012; Dawn C. 2015; Wandolo C 2016): The name base on Greek word „DEON" and means „duty" and „obligations". The theory focus on fairness, rights, commitments and DOING THE RIGHT THING. The deontological ethics includes rights theories. Human rights models, both philosophical and religious, are often important for the social, economic, and environmental dimensions of sustainability. Policies and projects aiming for sustainability can affect various rights, both those that are legally protected and those that are claimed on other bases. Thinking about rights becomes especially important for conservation and development projects conceived in one culture and applied in another since different societies understand and protect rights differently.The theory focuses on moral duties, obligations, intentions that guide decision-making. FAIRNESS takes priority over CONSEQUENCES that action would have (consequences do not matter). The goals, the end, and the objectives are of less concern. It is important that people cannot think only on their own wishes, but must think also of others. In Figure 32 there is some example of Deontological way of thinking.

Figure 32: Example of Deontological way of thinking (http://weclipart.com/giving+to+charity+clipart)

Charity is a moral act. Giving money to a poor person is a good act. If the poor person buys drug with the money, the original act of charity is still moral. Some actions are by their origin good, some bad, while the consequences of the action are irrelevant.

c) Consequentialist or teleological theory (Kibert C J, 2012; Aquinas R, 2012): This is another major model in Western philosophical ethics. In consequentialist or teleological ethical systems, decisions "about what to do" and subsequent evaluations of the morality of an action are based on the expected or actual consequences of a behavior. The name of this theory arises from Greek word „telos" and means the end, goal and purpose. The most prominent consequentialist model is Utilitarianism, where Bentham, founder of utilitarianism, claimed that the ultimate goal of ethics should be to create the greatest good for the greatest number of people. For Bentham, the good is happiness (known as the "greatest happiness principle," which is focused on pleasure), and an action could contribute positively or negatively to the overall good or happiness. Many approaches to sustainability implicitly that follow a utilitarian ethical model aiming to maximize selected goods – social, economic, and/or environmental – for the largest number of individuals or groups without the need to specify philosophical foundations. An example to explain the difference in thinking of ethics could be explained below. In Figure 33, one can see a father stealing the food in order to feed his starving family. How would a teleological thinker justify this action?

Figure 33: An example to explain the difference in thinking of teleological and deontological ethics (https://www.slideshare.net/aquinas_rs/lesson-4-key-terms-teleological-deontological)

The teleological thinker would justify the fathers' action with situation ethics, while the deontological thinker would justify it as natural law.

d) Pragmatism theory (Kibert C J, 2012; MMM, 2012; Verrunggen R, 2017): The term „PRAGMA" is a Greek word and means matter, thing, and action. In pragmatism, in regards to ethics, value must be judged bypractical consequences rather than intentions or relations to abstract goods. In addition, the theory presents an effort to achieve concrete, positive results in terms of its usefulness in achieving some end. By social and environmental ethicists and thus for people concerned with sustainability, pragmatism represents an effort to achieve concrete, positive results without the need to find consensus about abstract philosophical issues in advance (or ever). As well, it means to achieve good results over a minimum of bad results.

One of the most prominent philosophers of sustainability, Bryan Norton, said that people who seek a more sustainable society must join to first establish, and then achieve, practical environmental and social improvements. Norton, also a pragmatist, said that diverse environmental groups look past their foundational differences toward practical goals that are based on the best environmental science and management available, and that well-reasoned action is the best course in enacting change and overcoming these differences.An example of Pragmatism theory: if something is useful for achieving some end/goal then it becomes good. "Is that good?" – the pragmatic will reply as: "Is it good for what?" The pragmatic is „dealing

with things sensibly and realistically in a way that is based on practical rather on theoretical considerations".

In Figure 34, the comparison between theories related to tradition i.e. deontological, religious, teleological and pragmatism, are presented, in a view of thinking and results.

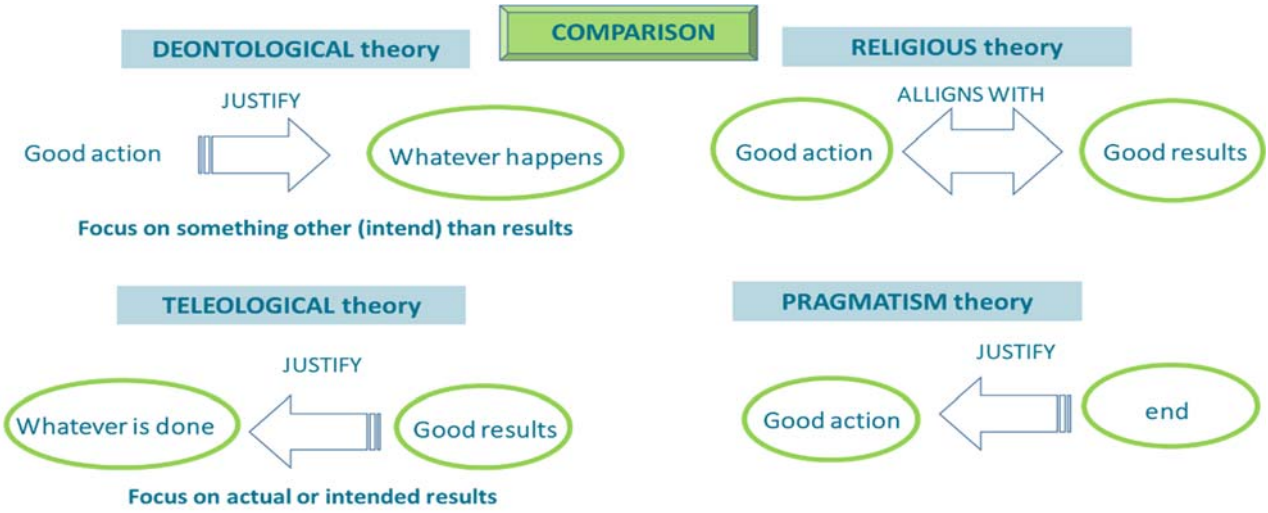


Figure 34: Different ways of thinking - the comparison between different theories related to tradition (MMM, 2012)

e) Ethical relativism theory (Kibert C J, 2012; Bryant L , 2016; Clements G , 2016): This theory asserts that moral value must always be defined in light of a particular context, which may include cultural, historical, or individual differences as well as the social, economic, and political relations that create an understanding of goodness in a particular situation. In contrast, objectivism in ethics asserts that judgments of good and evil rest on absolute foundations, which may be religious, philosophical, or scientific in origin.The Relativism is considered as i) an–idea, which views are relative and different in perception and consideration, ii) as there is no universal objective truth according to relativism; rather each point of view has its own truth, and iii) the belief that nothing is objectively right or wrong. The definition of right or wrong depends on view of particular individuals, groups, culture, and society. The relativism is a theory where individuals must decide - based on their feelings – what is right or wrong. In addition, the theory takes into account that there is no universal ethical rule to manage

the individual person that means "if person meets his/her own moral standard in making decision no one can criticize him/her for it".

The theory has some drawbacks as for example: the ethical relativism rule "when in Rome do as Romans do" can present problems. It is ethical dangerous for company and personnel to assume that local ethical standards are appropriate to guide their behavior. The questions could arise why if local standard support not paying taxes, bribery, or not want to see environmental pollution?

Social, economic, and environmental ethics in sustainability

Specific ethical fields and approaches that are most directly relevant for the ethics of sustainability, can be organized in relation to the three "legs" of sustainability, as presented in Figure 35 (Kibert C J, 2012).

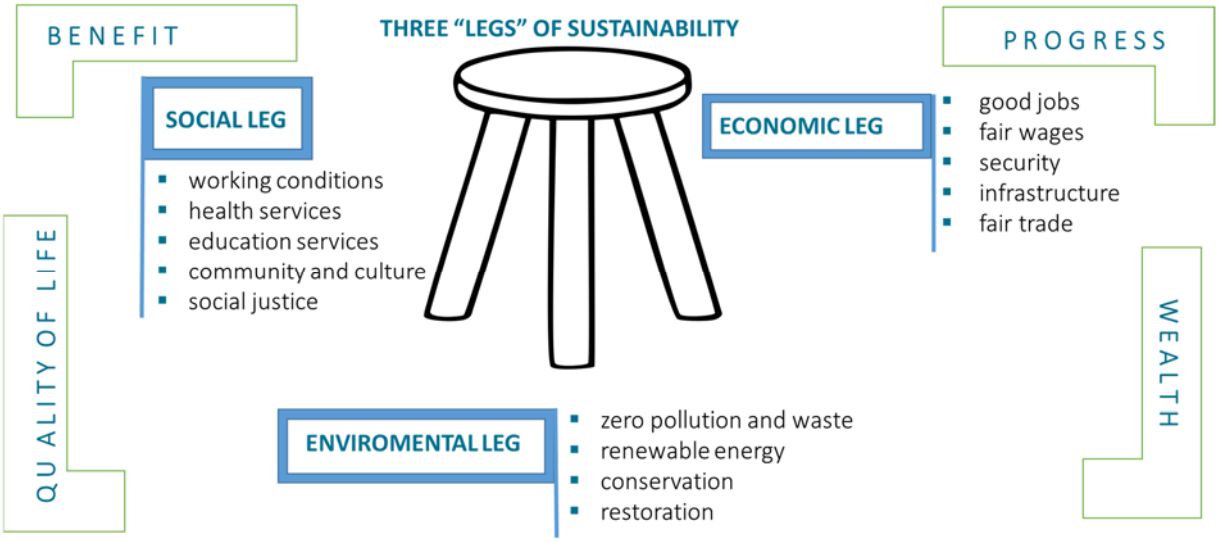


Figure 35: The sustainability is often defined in the social, the economic, and the environmental aspect point of view (Kavita P, 2017)

a) Social ethics is a subfield in both philosophical and religious ethics that is primarily concerned with the ethical foundations, dimensions, and consequences of collective decisions, attitudes, and actions. It is both – a social because it looks primarily at decisions and actions that are collective rather than individual and – personal, because it is concerned with goods that are collectively defined and achieved. Thus, the line between personal and social ethics is

never hard and fast. Still, it is possible to distinguish between moral issues that are primarily personal and those that have immediate and unavoidable social implications. The latter is most relevant for sustainability, because it is a quality of groups, including local communities, institutions, and entire societies. An ethic of sustainability is, then, a particular sort of social ethic. Social ethics has addressed the relations between individuals and larger groups, including the rights and responsibilities of the former and the beneficial as well as oppressive potential of the latter (Kibert C J, 2012; Kavita P, 2017).

b) Economic ethics here, however, is a subfield of social ethics. Economics by definition involves collective decisions and processes. When considering the ethical dimensions of economic systems, institutions, and decisions, a number of significant questions related to sustainability must be taken into account, i.e. *productivity, efficiency*, *and security*. Efficiency is usually defined as the maximization of output in relation to certain inputs.
In Western agriculture, the *efficiency* is defined as a minimization of human labor – fewer "man-hours" – in order to produce ever-larger harvests. The drive to reduce human labor has led to tremendous increases in the use of energy, mainly fossil fuels, and to the establishment of a particular type of farm. Such farms usually grow one or at most a few crops or raise only one species of animal.

This reduction of diversity maximizes efficiency, because you need fewer types of machines, but can create additional challenges, including the use of large amounts of artificial fertilizers and pesticides for plant production, and large amounts of waste in animal production. These farms employ very few people to work at very large areas and thus rely heavily on large tractors and other machines.

All these trends – stemming in large part from the drive for a particular kind of efficiency – have led to a number of secondary consequences, i.e. depopulation of rural communities, the loss of topsoil and biological diversity, and the contamination of soil, water, and air. *Productivity*, from the perspective of social justice, the drive for productivity often leads to pressure for fewer workers to create more goods and services, which can lead to higher unemployment rates and inequities between different levels of workers, as well as stress for those doing the work (*security*). The environmentalists point out that the high volume goals of productivity demand ever-increasing levels of consumption, which consumes natural resources and produces more waste (Kibert C J, 2012; Kavita P, 2017).

c) Environmental ethics is the third kind of ethics, involved in sustainability. It is defined as philosophical reflection on and arguments about the value of non-human nature. Environmental ethics may be concerned about entire ecosystems or regions or with smaller units such as species, individual non-human animals or plants, or landscape features such as mountains or forests. The environmental ethics is defined as "the individual is a member of a community of interdependent parts," and that an environmental or "land" ethic "simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land.Environmental ethics helps to understand the interdependency in order to understand the basic problem and find the solution. It is a moral study of what is right and wrong concerning the environment (Kibert C J, 2012).

The relationship between environmental ethics and the ethics of sustainability is often left ambiguous, and when it is specified, it takes several different forms as i) "environmental" – it is treated as a synonym for sustainability (ethic of sustainability virtually identical to environmental ethics), ii) ethic of sustainability identified with environmental philosophies (emphasize social and economic issues, i.e. environmental justice and human health issues), iii) anthropocentric (human-centered) environmental ethics as a kind of "civic philosophy":it emphasizes long-term human interests, humans posses complete authority over decision about environment, priorities are well-being of human and natural resources are open to humans; iv) non-anthropocentric - Biocentrism: focus on theory that all life-forms have inherent rights to exist, it splits into different subgroup- some place greater responsibility at protecting plants rather than animals, v) non-anthropocentric - Egocentrism: Earth itself has moral value and has to be treated with respect from those living with it, and Earth and its resources should be treated as a community rather than commodity (Norton B, 2002; Minteer B, 2006; https://www.slideshare.net/sweetncool40/environmental-ethics-8325458).

4.4.2 Ethical concerns in sustainable decision-making

Ethics in decision-making

Ethics can help people identify the values that are most important to them and analyse possible actions or outcomes in relation to these values. In real life situations, people often face decisions about i) what goods to prioritize, ii) given multiple values and limited resources with which to pursue them. Ethical questions arise, in other words, not when there is an easy

choice between a good solution and a bad one, but rather when real values conflict and it is not possible to preserve them all to the extent desired.

Such situations arise frequently in the context of sustainability, which strives to incorporate a range of social, economic, and environmental values in complex situations. Not infrequently, for example, environmental values, such as the preservation of wildlife habitat, conflict with social or economic goals, such as the production of a larger food supply or low-cost housing. In such situations, the goal of ethics is to help resolve conflicts, as constructively as possible (Kibert C J, 2012).

10-step process model for ethical decision-making

The 10-steps in decision making concerning ethics are (Newham College University Centre Stratford Newham, 2014):

- Stop, think and identify situation /problem (consider facts and feelings; check if there is a solution)
- Construct a description (this step help to clarify the situation and identify the issues or dilemma)
- Whose problem is it? (Consider the 'players' involved and seeks to identify some of the relational features; How might these help/hinder the situation?; What are the individuals' perceptions of the situation?)
- Review in terms of the ethical framework (consider the available sources of guidance, e.g. literature, legislations, laws, good practice, etc.
- Consider legal, moral principles and values (moral principle provide way for evaluating critical relationship or context)
- Identify the support that is available (identify who is available to offer support, e.g. supervisors, consultant, mentor, etc.)
- Identify courses of action(consider as wide as a range of options as possible and consider the impact and likely consequences of each action identified)
- Select course of action (review the literature; define best actions; consider which guidance might be of help; ask oneself would other recommend a chosen action, and would other follow your decision?)
- Evaluate the outcome (ask oneself was the outcome as imaged, expected, and hoped? No surprising factors emerged?) Would you take the same action in future?)

- Regular check the personal impact on event (from time to time check how situation affected the involved people; Did you need any skills or knowledge to be developed?)

Solving ethical problems

Problem solving is the process of removing the inconsistency between actual and desired outcomes. Most people confront problems by first acknowledging that they exist. The second step is identifying the problem and analysing it. In addition, the alternative solutions should be taken into account. The following step includes the decision-making - This includes the selection of the best solution among several alternatives. The final step is to take a decision – to implement the solution. The optimal problem solving approach is presented in Figure 36 (FPSP 2002).

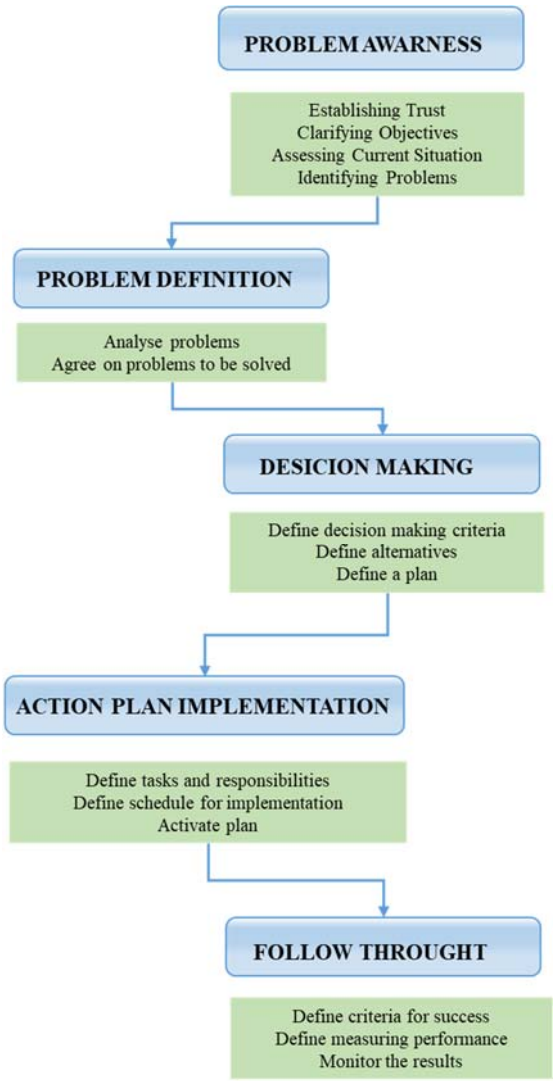


Figure 36: The rational problem-solving approach (FPSP 2002)

Ethical problems can be divided into i) volitional, ii) cognitive and iii) social. The people often know what to do, the dilemma that could exist is volitional i.e. will I actually do what is right? This dilemma arises by competition interest. Cognitively decision arises when we are uncertain if we do the right thing. In the situation, when we feel certain what the right thing to do is and we are willing to do it, but the decision is socially problematic, because there is a disagreement between stakeholders (DuBois James M:, 2008).

In Figure 37, the example of the impact of ethical/unethical behaviour, within business area, is presented (Perera N, 2013).

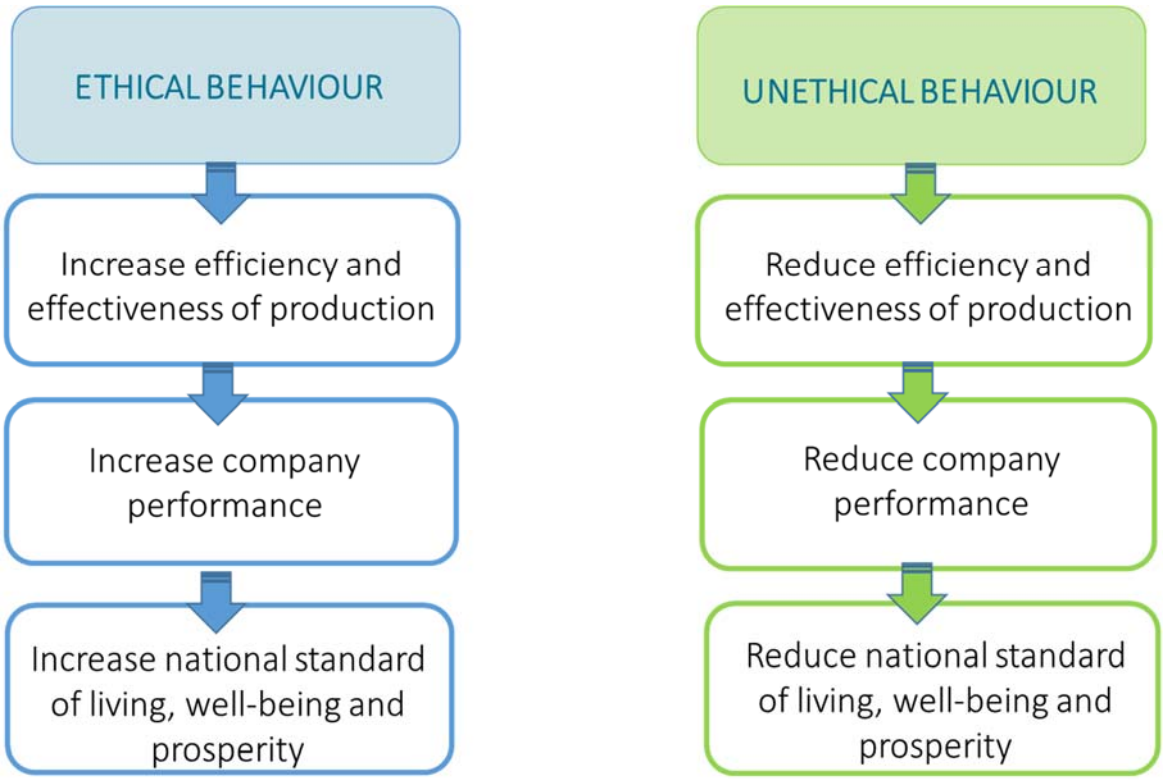


Figure 37: Effects of ethical/unethical behaviour within business sector (Perera N, 2013).

Characteristics and principles on ethic sustainability

a) Characteristic of ethic sustainability (Kibert C J, 2012): In relation to sustainability, scientific and social knowledge is especially important. An ethic of sustainability must also have clear and coherent interpretations of key foundational issues. Further, since the goal of

sustainability is, by definition oriented toward the future, an ethic of sustainability must take into account the relations between present and future generations (both human and non-human).In addition, an ethic of sustainability, like any social ethic, should address the question of rights or interests. A Deontological ethic is more likely to assert that people (and perhaps non-human animals, plants, or places) have rights, while a Utilitarian ethic speaks about the interest of people or animals. Ethic of sustainability should be feasible or practical. The purpose of an ethic of sustainability is to guide people in their efforts to address real world problems and to build more socially, environmentally, and economically sustainable institutions, practices, and societies. Sustainability ethics is a new discipline that analyses the issue regarding moral obligations to future generations with respect to environment. It is an application of standards to relation human - non-human species, arising questions like "Should we preserve resources for future'", "Should human drive other species to extinction?", "Is it O.K. to destroy forest to create jobs for humans?", "Is it O.K. for some communities to be exposed to excess pollution?" (UCLA, 2010; Belyakov A, 2012).

b) Social ethical Principles (Kibert C J, 2012): From social ethics, the most important principles for sustainability concern i) justice and ii) obligations to future generations.

bi) Justice principle: Aristotle and subsequent philosophers have identified several specific types of justice:

- Procedural (or formal) justice, which entails fair processes in governance and criminal justice. Procedural justice establishes rules and standards by which these decisions are made, which is necessary to ensure both political democracy and the rule of law;
- Other social practices and institutions, including the allocation of resources;
- Substantive justice: refers to absolute quantities, seeking to provide those people with an absolute amount of food adequate to their needs, not just with a fair share of an inadequate amount. Substantive justice has traditionally been less important. A society that distributes an inadequate amount of food equally among all its members, for example, will not be sustainable, although it may be just (through distributive justice). A sustainable society must meet the principles of substantive justice by ensuring that people's basic material and economic needs are met;

- Distributive justice: is concerned with the fair or correct distribution of goods in a society. For an ethic of sustainability, attention would have to be paid, not only to social and political goods such as housing, health care, food, and political power, but also to environmental goods, such as clean air and water and perhaps access to recreational or wilderness land.

Social principle for sustainability concerning obligations to future generation means the obligation to leave future generation's adequate material resources. This obligation may demand significant restraint (even sacrifice from future generations). As well, just as the obligation to leave them a fair and democratic society. This obligation may require that great amounts of time and energy be spent in political action to create and stabilize the practices, laws, and institutions that characterize such a society.

bii) Obligations to future generations: Is dealing with relation to economic ethics, precautionary principle and reversibility principle.

In relation to economic ethics: The most important principle for sustainability concerns is the polluter pays principle. It represents important moral and philosophical points thus requiring polluters and others, who damage natural systems to pay for their actions. This principle suggests that people should properly be held accountable for the harm they cause to commonly held goods, including non-human nature.

Precautionary principle: One of the most important environmental principles for sustainability, addressing scientific and technological projects, that may have effects on environmental and public health (i.e. would prevent the use of pesticides whose wider ecological effects are not understood; restrict damaging use of certain resources or landscapes – such as mining or grazing). The precautionary principle also reflects a particular understanding of the relationship between knowledge and morality. It has been widely affirmed by environmental groups and is central to sustainability.

Reversibility principle: Where people should not make decisions that cannot be undone by future generations (i.e. irreversible action, as it is the extinction of species).

4.4.3 Ethics in Sustainability Education

Basic facts of Educational system

An important dimension often overlooked in education for sustainability is direct contact with nature. Being in, understanding and appreciating nature not only provides a foundation for a scientific understanding of the natural world, its contributions and requirements, but also creates an emotional and spiritual resonance that supports a strong environmental ethic.

Many people, who have chosen environmental careers or shown a strong environmental sensitivity as adults, experienced nature as children. On contrary, in a world that is rapidly urbanizing, an increasing proportion of children have little or no contact with nature. Thus, make it more difficult for them to be motivated towards environmental protection and responsible living in harmony with nature later on. In the case, when the formal educational system is unable or unwilling to provide ethical instruction, families and communities may give their children social skills that will orient them towards a more sustainable and fulfilling life. This could be with children's classes providing activities and instruction adapted to each age group (Dahl AL, 2015; IEF 2013).

Education for ethics sustainability

Perhaps the most important time for ethical empowerment is the pre-adolescent years from about 11 to 14, when children are leaving the parental fold and adopting their own values and directions in life. Groups of pre-adolescents can be accompanied, as they read stories about the ethical challenges, faced by those of their own age who have faced problem of poverty, civil war and lack of opportunities, and plan and implement their own service projects in their communities. Such young people would experience the pleasure that comes from altruistic acts of service, and build confidence in their own abilities to communicate, take charge, and organize their own activities, they will be better prepared to face the challenges of life as they grow up in a positive, constructive way (Dahl AL, 2015; IEF 2013).

Importance of ethics sustainability education

Such activities are often best accompanied by youth, not much older than themselves, whom they can relate to and communicate with more freely.

Educational systems are some of the most conservative institutions in society, and quite resistant to change. Each generation of teachers is most comfortable with the methods they have learned and practiced in the classroom. Therefore, adapting to a more diverse and globalized world and learning responsible lifestyles can take a long time to introduce into the curriculum. In some countries, schools are run by religious institutions, which insure some ethical instruction at least within one doctrinal framework. In other countries, education is completely secular. Neither is ideal, as instruction limited to one faith tradition may exclude some important ethical principles for sustainability. In a secular system, there may be no mention of ethics and religion at all, leaving young people ignorant of a major dimension of human experience and culture. In the diverse world of today, where schools have students from many faith traditions and no tradition, it is important that ethics and values be presented with neutrality, sensitivity, and respect for each perspective (Ashraf I et al, 2011; IEF 2013; Dahl AL, 2015).

Approaches for teaching ethics and sustainability

Teaching children to become environmentally emancipated means preparing them for the real world. This means to prepare them to face with challenges of sustainability at the local, national, and international levels. This also involves critical thinking and problem solving abilities (Doherty B, 2006).

Teaching children to adapt to situations and solve problems beyond the classroom means that they would be able to solve sustainability-related problem later on. As future decision makers, problem solvers, and change agents, children will benefit from learning about sustainability through full immersion. The active learning means getting involved with the information presented; meaning really thinking about it (analyzing, synthesizing, evaluating) rather than just passively receiving it and memorizing it (King A, 1993).

Active learning is a practicum-based education, experiential by its very nature. Sustainability education is multi-faceted and complex, global and local, social and individual. Using an active learning constructivist approach, the children will know how to learn and as well, it would encourage them to be lifelong learners.

Approaches for teaching ethics and sustainability are (Ravi V, 2016):

- Encouraging Issue-Based Learning: the children are actively involved, it fosters active learning, and also retention and development of lifelong learning skills. It encourages self-directed learning by confronting the children with problems and stimulates the development of deep learning (Spencer J.A et al, 1993; Antepohl W et al, 1999)
- Holistic Curriculum Approach (Kelly M, 2017): there are three R's for education: Relationships, Responsibility and Reverence for all life. This means: i) children need to learn about themselves (self-respect and self-esteem); ii) children need to learn about relationships with others, focusing on social "literacy" (learning to see social influence) and emotional "literacy" (one's own self in relation to others), iii) children need to learn about resilience (i.e. overcoming difficulties, facing challenges andlearning how to ensure long-term success) and iv) children need to learn about aesthetics thus encouragingchildren to see the beauty of what is around them and learn to have awe in life. Curriculum is derived from the teacher listening to each child and helping the child bring out what lies within oneself (Holistic Education, Inc. , 2003).

- Making Education Relevant: children need to experience »what was taught has a purpose in their lives«. The ways for obtaining this are i) examples from the real world; ii) use objects, artifacts and perform experiments, iii) plan trips, iv) invite guest to present different point of view; v) use project-based learning with real world problem, vi) extra bonus who present examples from the real world.

- Socially critical orientation: children should learn to be socially critical, i.e. to adopt critical thinking, critical reflective knowledge in order to solve environmental problems
- Future perspective: do be able to see future because of existing environmental facts thus be able to recognise present, past and future actions

5 Principles of inquiry-based, experiential education and learning

„I hear and forget.
I see and remember.
I do and I understand."

(Confucius, 500 B. C.)

The model of experiential learning was created by **David Kolb** at the beginning of the 1970s, while its practical bases were worked out by **Kurt Hahn** - who is not really known in Hungary, but is respected and well-known in Western-Europe and overseas – much earlier, in the 1920s. As an answer to the criticism of the current society and education, he created his "supporting therapy" that originally was realised as pedagogical methodology and "school".

According to David Kolb: „*Experiential learning is a process during which knowledge is generated through the transformation of experience".* (original Hungarian quotation: http://tapasztalati-tanulas-kepzes.hu/tapasztalati-tanulas/) *In his Experiential Learning Model he defined four steps:*

- First step: concrete experience
- Second step: observation of the experience and feedback on these observations
- Third step: establishing abstract concepts based on the feedbacks
- Fourth step: testing and using these concepts

Through the circular repetition of these steps, there is an opportunity for creating a spiral development. In the process model of the experiential learning, Davis A. Kolb regards own experience as the key element of behavioural change. The use of his four-stage model does not only offer an opportunity for developing skills, but it may also help to change certain behaviours and habits (concerning others and ourselves, too).

Therefore, it is important what happens to us but it is even more important what we do with the happenings. During experience-based learning, it does not matter how much time learning takes. What really matters is to step forward from the experiential phase to the phase, when we reconsider experience, then to critical analysis and generalisation, and finally we arrive at the phase, when we plan how to use the recently acquired ability.

The expression "experiential education" (EE) is more often used in English speaking areas and it practically covers the same professional area as the concept of "Erlebnispädagogik" that is used in German speaking areas and is also based on the work of Kurt Hahn.

According to the definition of the AEE–Association for Experiential Education

„The experiential education (experience pedagogy) is a process through which the person practising it generates knowledge, skills and value from direct experience." (original

Hungarian version: http://www.kettealapitvany.hu/tapasztalat-elmeny/tapasztalati-tanulas/)

Experiential learning is an ***active way of learning and development****. The participants do not get knowledge from the teacher, but they acquire new knowledge from processing their own attempts. The knowledge acquired this way is more efficient than the previous one, because it is not based on theories, but on the own, actual experience of the participants.* (original Hungarian version: http://www.borosandras.hu/oldalak/taptanreszlet.html)

Examining the extent of memory and efficiency of learning Weiss had the following results that show what the adults remember three days later:

- *10 % of the material they have read,*
- *20% of the material they have heard,*
- *30% of the material they have seen,*
- *50% of the material they have heard and seen,*
- *70% of the material they have pronounced,*
- *90% of the material they have experienced and have been linked to activity.*

(Hungarian version: http://ideateam.hu/modszertan/tapasztalati-tanulas.php)

Learning is an individual process for all of us. Everybody learns in special, individual ways and situations. Besides, the learning process can be described generally and the differences can be shown best in emphasis and style. Getting to know the process and styles it provides opportunities for us to recognise the advantages of the different learning styles and to be able to use them. It may develop into a kind of ability by means of which we will be able to learn from the most varied situations and experience so we will be able to maximise our learning opportunities. The theory and approach of this kind of learning is important, but it is also necessary to have an environment for this, which provides a frame for experiencing this approach. The creation of the frame adapts to the given content element. For example in the school it is worth leaving the strictly defined walls and desks behind.

The activity-centred experiential learning is of **experiential nature,** but it is useful at the same time: it is suitable for transferring, systematising and deepening knowledge, that is, it is capable of everything we expect from traditional education that transfers knowledge. The

passive reception is substituted by **learning by activities,** which creates a motivational base through **activities** and experience for the reception knowledge. The contents that used to be called "teaching material" is still the inalienable element of the process, but the target system is complemented with a new element: the expectations related to the **development of competences**. The two aims seem to be very distant from each other at first – knowledge transfer and competence development – but they are closely connected in the learning process.

The experience or activity-centred **learning organisation** is nothing else but the rediscovery of natural human learning forms and adapting them to organised school frameworks. Its methodology can be learned just like teacher presentation, discussion by means of questions or the well-known didactic strategies of questioning. Its merit is that it adapts better to the specialities of spontaneous human cognition and builds on our desire for cognition. The activity-centred learning organisation is nothing more and different than a **special form of work** that does not necessarily affects the contents of the teaching material. By using its methods, the most varied teaching materials can be processed.

The activity-centred learning is a **developmental methodology** that is based on activities and requires participation. The participants do not gain knowledge from outside but they draw consequences from their own attempts, experiences and experience originating from the situation and they get new knowledge about themselves, relationships and group processes (some references are missing). The strength of the method is that:

- it involves the participants on an extremely high level in the process;
- we can obtain concrete solutions to be implemented in the practice;
- it means an experience of high intensity;
- it is authentic, as its starting point is reality and transfers knowledge to real life.

It is not coincidence that we are discovering the activity- and experience-centred learning, which was forgotten, when the schools became institutionalised, these days when improving competences were in the centre of the teaching process. The concept of "competence" means that we are able to turn our knowledge, abilities and skills into problem solving activity. The competent student is capable of solving problems or tasks that match their age and level of preparation.

It is obvious that we can teach students how to act and solve problems only by acting and solving problems. Therefore, in the activity and experience-centred teaching objective and process are interwoven: one aim is to carry out the process in the most active way

possible so that the students can gain more and more experience and competence experience as well. At the same time, the arrangement, recording and storage of the experience gained during activities is also part of the process. We cannot ignore this because the knowledge of "I remember" type (experience) generated in experience-centred learning in themselves do not correspond to the logically arranged "I know" type of knowledge. During recording, we recall and place the experience on a suitable mental map. This way the experience is connected to knowledge and helps to recall it. Then practising new knowledge means recalling and using it in a new task situation. Consequently, activities, experience and knowledge penetrate the whole learning process in a cyclical, complementary way, supporting each other.

The activity-centred approach in the school changes the relationship of the students to teachers and knowledge: knowledge becomes active and lifelike, which makes teachers able to transfer experiences instead of simply transferring knowledge and students can learn from these experiences on their own. Students become active as they are taken out of traditional school and class environment. Because of the students' activity, teachers must be absolute flexible as they have to reflect to the students' behaviour and the emerging situations. In this way, teachers also get into a situation, where they have to learn, so they can get away from the "red tape" around them, which is created by educational policy, school, curriculum etc. The teacher works basically as a facilitator, who gives individual and team feedback, defines limits and if it is necessary, makes students obey them, relieves worries and answers questions.

During experiential learning, we are continuously in the cycle of planning, activity, assessment and application. Assessment is an extremely important phase in the process, as without processing experiences, the exercises would be only free time activities.

The host of the sessions helps (facilitates) and does not teach. In these sessions, the source of knowledge is the own experience of the participant. Facilitators help and motivate the participants in the learning process. They assess the group and choose suitable tasks for them, take care of safety, monitor the group during the assessment and after the exercises, they use the learning opportunities hidden in practice.

The principles of the practice of experiential learning (http://www.morahalom.hu/elmenypedagogias_kepek)

Experiential learning is effective if

- the carefully chosen experience is followed by reflection, critical analysis and synthesis,

- experience is built up in a way that motivates the involved person to take the initiative and make decisions, as well as make them responsible for the consequences,
- during the experiential learning process, the student is actively involved in asking questions, investigating things, experimenting, solving problems and in this way they become curious, take responsibility, show creativity and form an opinion,
- students are committed intellectually, emotionally, socially, mentally and physically,
- the moral is personal, so it establishes future experience and learning,
- the relationships of the students to themselves and others, immediate and extend environment development and improvement,
- the teacher and the student can experience success, failure, adventure, taking risks and uncertainty,
- there is a chance for the student and the teacher to discover their own values,
- the primary role of the teacher includes searching for suitable experience, presenting problems, defining limits, supporting students, creating emotional and physical safety and stimulating the learning process,
- the teacher recognises and motivates the spontaneous opportunities for learning.

The method of experience pedagogy - the experiential learning can be used in many levels. Although it is not important because of this, but the experience pedagogy games and practices are entertaining, so they can be brilliantly used at any community event where the aim is for everybody to have a great time.

At the same time, it can also be used for learning, even in a school situation, for delivering curriculum elements defined by the state. Surely, the teachers must prepare more for this type of lesson, but is it certain that students are more willing to take part in this class than in a traditional one. They cooperate, have a good time and learn – and this guarantees that knowledge will be long-term and students will understand the learned things. Apart from delivering teaching material, we can also use it to develop different skills, especially social ones, like communication, recognising emotions, empathy, recognising other's needs, communication, time management, anger management, self-knowledge or cooperation. Most of the tasks are suitable for developing plenty of diverse competences, depending on some factors, for example: what rules we can use while making participants play; how the host of

the session reacts to the emerging situations; and finally how they manage the conversation (processing) after the task has been completed. If we use it, focused on individuals, experience pedagogy may even be suitable for therapy.

As a summary:

Experiential learning is the most effective and changes the behaviour of the student in the most significant way, when it starts from some experience or problematic situation and when the student gets involved in the learning process. Involvement is the most probable, if the student feels it is necessary to solve the given problem, the process is active and it takes place in an authentic social environment. It is also true for the learning and professional development of the teacher.

"Man cannot discover new oceans unless he has the courage to lose sight of the shore" – André Gide

6 A METHODOLOGICAL AID

In education, the main goal is to make learning accessible to everyone. This presupposes that everyone learns to write and read.

Nevertheless, all these are in vain, if the society in which we live is unsustainable. That's why it is so important that sustainability as well as the idea of the harmonious coexistence between nature and social environment to be present in the education system.

We can achieve results in the field of environmental education if the graduating students can use all their acquired competences to deal with environmental problems. Through reading comprehension to social competences, the use of all areas of competence is necessary for someone to become an active, responsible, environmentally conscious citizen in the life of society. Societies have always wanted an education system that meets one needs, that meets the requirements of both individual and smaller and larger communities.

The main purpose of today's education system is to develop competencies. What is competence?

A cluster of related abilities, commitments, knowledge, and skills that enable a person (or an organization) to act effectively in a job or situation. Competence indicates sufficiency of knowledge and skills that enable someone to act in a wide variety of situations. The development of competences needs to be extended to all learners.

The eight key competences identified by the European Commission and included in our education system are as follows:

1. **Communicating in a mother tongue**: ability to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing.
2. **Communicating in a foreign language**: as above, but includes mediation skills (i.e. summarising, paraphrasing, interpreting or translating) and intercultural understanding.
3. **Mathematical, scientific and technological competence**: sound mastery of numeracy, an understanding of the natural world and an ability to apply knowledge and technology to perceived human needs (such as medicine, transport or communication).
4. **Digital competence**: confident and critical usage of information and communications technology for work, leisure and communication.

5. **Learning to learn**: ability to effectively manage one's own learning, either individually or in groups.
6. **Social and civic competences**: ability to participate effectively and constructively in one's social and working life and engage in active and democratic participation, especially in increasingly diverse societies.
7. **Sense of initiative and entrepreneurship**: ability to turn ideas into action through creativity, innovation and risk taking as well as ability to plan and manage projects.
8. **Cultural awareness and expression**: ability to appreciate the creative importance of ideas, experiences and emotions in a range of media such as music, literature and visual and performing arts.

In order to succeed in any field, one should have a high level of native communication competence. Environmental problems are global. If someone wants to do something in this field, they need to communicate in a foreign language, they must use their ability to communicate in a foreign language. Environmental issues arise within the field of natural sciences as a curriculum, which is part of the same field of study as mathematics. It is not by chance because understanding the environmental processes cannot be imagined without mathematical competence, and active involvement in solving environmental problems requires the active and creative application of mathematical abilities. From selective waste collection to water pollution, introducing the practice of environmentally conscious shopping, we need to support our argument with concrete facts and figures, which would be impossible without mathematical competences. Digital literacy makes communication more efficient, developing social relationships, and information acquirement. The active contribution to the development of an environmentally conscious society assumes the acceptance, processing, use of new knowledge, so it presumes high-level learning-methodological competences. People are behind the environmental pollution and environmental problems. In order to convince them of the need for change, to be able to connect with them, it is not enough to have excellent communication skills, but also to have interpersonal, inter-cultural, social competencies. Knowing the interests, opportunities and duties of people is necessary to be able to take part in solving environmental

problems. This requires the acquisition of civic competences. When developing entrepreneurial competences, students are enriched with knowledge of an environmentally conscious enterprise, or how to make existing businesses sustainable. However, the development of environment-conscious behavior and sustainable development requires the development of competence elements such as: critical and creative thinking, system approach, knowledge of sustainable development, knowledge of global, national, regional and local problems and their consequences, solidarity and responsibility of different generations. Since our current lifestyle is unsustainable, it is very important to encourage the students to develop critical thinking and creative thinking in order to find solutions to the arising problems.

Progress was so fast that today teaching most of the details of human activity will provide usable knowledge only for a while. Personality needs to be developed so that a prospective citizen, employee, family member and people in many other roles to be able to adapt to rapidly changing circumstances.

Practical knowledge becomes only that one which allows the lifelong learning. It requires the existence of skill sets that allow communication, solving problems, decision-making in new situations, conflict management, co-operation during work, and coping with dangers under the new circumstances.

Innovative pedagogy seeks to make work a learning tool to gain experience, using games, project, debate, conflict resolution, problem solving, research and discovery.

How does environmental education contribute to the development of key competences?

Environmental education - the pedagogy of sustainability plays a role in almost every aspect of education. Whatever people do on Earth has to do with the conditions under which our species can live on the planet, how to use its resources, how to live with its potential. Sustainability of life is not just a subject of biology or nature education but a general educational issue. Within each subject you can talk about environmental problems and how to find solutions.

One of the serious problems of the current school system in Romania is that, due to the constant reforms, there is no longer a long-term educational policy, educational program.

The new framework curriculum increases the number of hours that are considered too high and narrows for schools the possibility to the choose, that's why many people only hope is the responsible and innovative attitude of the teachers. But during the questionnaire, it turned out that, unfortunately, teachers are familiar with new methods and procedures in theory, but in their everyday work, the inadequacy of a good part of traditional pedagogical procedures is predominant. In addition, many other phenomena all warn that fundamental changes in the field of education are needed. The placing of non-constructive competition above all, the seriously negative attitudes of children to school, and the lack of the child-centeredness are all phenomena that negatively affect the development and results of students. The primary goal of traditional teaching is knowledge transfer, and in most cases, communication, experience are not possible. There is competition and rivalry between students, no empathy and tolerance. There is no help and cooperation among the students, because if they help each other, it is considered a fraud. One-sided, one-thread, consecutive communication is ongoing. There is no emotional influence, no opportunity for self-activity, creativity. Frequent failure experiences may lead to uncertainty, self-assessment problems resulting in low performance. On the other hand, we would like to present some co-operative methods by recommending methods and procedures used in the present project, where the simultaneous, parallel interaction principle applies to everyone. Multi-threading communication among students to gain experience in contact-making, advocacy, assistance, and collaboration contributes to the development of students. The goal is to involve everyone, to empower themselves, to work on equal peers, to build positive, positive interdependence, to be interested in advancement for the success of the group. Students are much more involved, more active and more motivated. Empathy, tolerance, and the social sensitivity of students to their counterparts develop. Developer aid evaluation is predominant, characterized by diversity, positivity and multi-levelness, and the teacher adjusts learning to that process. In the relaxed, cheerful atmosphere, emotional motivation and influence prevail and having a positive impact on student activity, social values. Students get constant feed-back, which helps emotional development.

The co-operative methodology operates on four basic principles, the first being simultaneous and comprehensive parallel interaction, the second is constructive and stimulating interdependence, the third is equal participation, and the fourth is the individual responsibility and accountability.

Competences

Instead of literacy, we strive for the development of competences, that is, not so much the acquired knowledge as the active capacity for action. A solid efficiency is the goal that enables students to act effectively in different situations by applying the acquired knowledge, enforcing their abilities and skills.

Sample lesson plans often cross the classroom walls, their interdisciplinary nature breaks down the subject line dividends. They need a new kind of teacher-student relationship (the teacher does not control the whole class, but it helps the project from within).

The use of these methods can be a tool for drawing on a group of people from the learning group. They give a chance to jointly develop cognitive skills and social relationships.

Much of the methods / games / good practices we recommend, are applied in our sample activity plans. Teachers save time and energy by using this manual, as they will not only find a description of a method, but also its specific application.

METHODS APPLIED

Presentation

The most common and oldest educational method that has been used and is currently being used before schooling, in family, later in vocational education and training. There are activities that cannot be learned without presentation, but it is easier to follow some form of presentation than any verbal description of each action. The complexity of the presentation, the control of the cognitive activity, and the degree of student autonomy, the action, the perceived, the symbolic acquisition of knowledge can be modified depending on the students' level of development.

It is recommended in presenting the food pyramid to be fully visible.

Explanation

Since all learning is based on knowledge acquisition, one of the basic methods is the explanation, which is a monological teaching method by which we can help to understand the legitimate contexts, rules, theories and concepts. Its content and duration are shorter than in the case of presentation, depending on the topic of the subject and the age of the students and it can last 5 / 25 minutes. There are a lot of grouping possibilities. The typology outlined by

Brown and Armstrong (1984) seems sufficiently simple and useful. They distinguish three types of explanation:

1. Interpretative explanation, which makes the meaning of terms and terminals clear, gives examples, typical questions: What? What?

For example: What is the role of the teacher during the discussion?

2. Descriptive explanation, which serves as a demonstration of a process and structure, is a typical questions: How?

For example: How can you access the Internet through the help of foreign libraries?

3. A causes-revealing explanation, which is used to identify the causes of phenomena, typical questions: Why?

For example: Why does high inflation make the introduction of student loans impossible? When walking, in gaining or extending their knowledge, it is recommended for better understanding.

Discussion

Discussion is a dialogic oral communication method in which students respond to the teacher's questions in order to develop the curriculum. Discussion is the most commonly used, most popular approach for all ages. Its popularity among teachers and students is due to the constant contact between the teacher and the students, and the teacher receives regular feedback from the pupils so that they can go according to their needs who can take new aspects into the process of processing; the students are active, they find the solution themselves; the method offers a common sense of success, it is interesting having a significant motivating effect.

It can be used in any situation, in each lesson.

Evaluation

Different forms of feedback and evaluation should be used, depending on whether they are correct, partially correct or incorrect after a student response, or may appear in the absence of a student response. In some cases, after a good student response, a praiseworthy word, or even a smile, nod, gesture may be a proper feedback.

It is indispensable for all classes.

Mosaic learning

One of the useful methods of co-operative education is the method of mosaic learning developed by Aronson in the seventies, and it consists in groups of six-member who read their part of the task. Then, members of the different groups who have studied the same part, will meet. After the discussion, they return to their own group where, according to the agreed version, everyone reads the entire material, and "experts" help others to study it more thoroughly.

It is a very good method to understand the parts of the food pyramid. If you have fewer pupils, make only four-member groups. By the end, all students learn the whole material.

The following methods can be put in four categories:

- Methods helping inquiry-based learning
- Project-based methods
- Methods helping teamwork at school
- Activities implemented in nature/fields

Although these methods can be different from the point of view of their duration, possible work forms and description, they have some common characteristics. The following features are true for all of them:

The topic processed during the methods: All (it depends on the teacher's intention and creativity).

The learner group activated during the methods: Above the age of six (it is easier to use them if the children can read and write).

The ICT devices needed during the methods: Not necessary (but some of them can be made more spectacular and enjoyable with the help of these devices).

The key competences that can be developed by the methods: 1. Communication in the mother tongue, 2. Communication in a foreign language, 3. Mathematical, Natural Scientific and

Technological competence, 4. Digital competence, 5. Effective independent learning, 6. Social and civic competence, 7. Initiative and venturesome competence, 8. Cultural competence (Aesthetic and artistic awareness and ability of expression)

Transversal (interdisciplinary) competences that can be developed by the methods: 1. Acquiring independent learning, 2. Social competences, 3. Cooperative activity, 4. Critical thinking and reflection, 5. Digital competence

The sources, the duration, the possible work forms and the descriptions can be found in the following, at each method. The duration and the work form always depend on what the method intends to process.

7 Methods helping inquiry-based learning

7.1 Window

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a lesson between lessons
- lessons and/or periods between lesson

- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

It is a suitable method for revision and systematizing and developing groups. This method is mainly used to organize and review the knowledge. It has got different varieties. Draw a square in the middle of a sheet of paper.

Connect the corners of the square with the corners of the paper (you can do it in the spinning, too). In the central square, you write the topic of the grouping (a question, a picture, a definition, etc.).

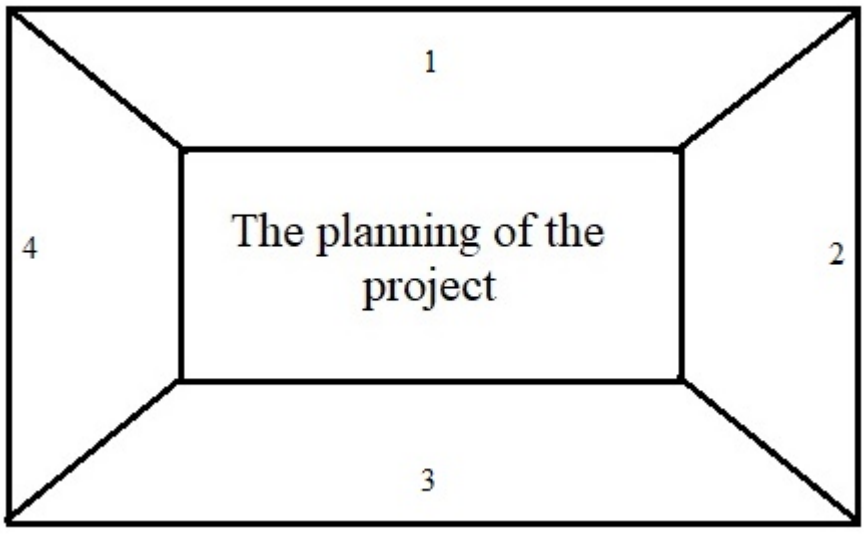


Figure 38: The image of the method named window
(http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf
http://www.hefop.ektf.hu/anyagok/kooperativ_modszertan.htm)

The members of the group work together on the sub-topics in the four parts of the square bordered with the lines.

Another variation: everybody works on the same topic. In this way, we can help the organization, the imprinting and practice of knowledge.

A third variation: we number each edge (1,2,3,4 and we leave the central part empty).

The group records that opinion, thing, fact or feature that members 1,2,3,4 think.

They write the group opinion created by consensus in the central part. We can use this method in any kind of school subject.

7.2 Group interview

Sources**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

It is a suitable method for revision and systematizing and developing groups.

The groups report on a given situation (e.g. a book) according to four parts or they can act out fictive conflicts connected to certain roles.

Those children who have the same role in the different groups create new groups, and then they present the "monologues" to one another.

Going back to their original group, everybody reports.

Another variation: all members of the group ask questions from all the other members.

This method develops the highlighting of the essence and the communication skill.

7.3 Sending and exchanging tasks

Sources**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups

- a whole class

The description of the method:

It is a suitable method for revision and systematizing, also a master method.

Everybody elaborates a question, which they write on a card. They write the answers on the other sides of the card. Then the groups exchange the cards.

One member reads the question aloud and the others discuss and check the answer. If it is not the same, they expand and correct the text. The card can be sent forward and sent back to that person, who has elaborated it.

Another variation is the exchange of tasks. The groups/the pairs exchange their tasks and they do not have to wait for one another. They control one another's work and discuss the emerging questions.

The students make a quiz. They formulate the questions, too. Then they draw an unfilled figure that they send to one of their partners with a list of questions attached to it. They could use a map, a dictionary and internet to create the definitions.

7.4 A quartet of students

Sources**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

It is suitable for controlling and also a master method.

It has got four steps. Each member of the group pulls a number. Each members of the group get a number.

1. The teacher asks a question or gives an instruction.

2. The members of the group discuss/elaborate the answer. Flash cards, think-and-discuss, cap council-in-pairs and other methods can be used for imprinting.

Each members of the group have to acquire the knowledge.

3. The students control one another whether everybody knows the correct answer.

4. The teacher randomly chooses a number (or group if necessary). That student has to give an answer whose number is pulled by the teacher.

7.5 A simultaneous quartet of students

Source**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups

The description of the method:

This is a method of control. It is a variation of the quartet of students. We can apply it if we have several groups. Those members of the groups, who have the same sign/number, can simultaneously give the answer at the board or in another way, e.g. with hand signal. The next task is answered by students with different signs.

7.6 Control in pairs

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- among groups

The description of the method:

This is a method of control, also a mater method.

The groups are divided into pairs. The pairs work on a worksheet. One student elaborates the first task and the other watches him/her and helps if necessary. If they do not agree with the solution, they ask another pair or the teacher.

At the next task, the members of the pairs exchange roles.

They compare the filled worksheet with the one done by the member of the other group and – if the answers are not the same – they look for the solution together.

7.7 Disks of opinions

Source**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- among groups
- a whole class

The description of the method:

This method evelops the social skills. It helps the start of the communication and the formulating of opinion.

Make small disks, on which there are indicative sentences.

Create the labels of the disks together, e.g. I refuse this idea OR I accept this idea but I complete it OR I only partly agree with it, I complete it OR I agree with it, etc.

Decide about how many of them you make.

Then everybody puts the ready disks in their own envelopes and they can use them during the group discussions. They can use only their own disks.

7.8 A cooperative debate

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

https://library.gwu.edu/utlc/teaching/cooperative-debate-50-minutes

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- among groups
- a whole class

The description of the method:

This method develops the social skills.

Four opinions can be chosen regarding a debated question. Everybody formulates their opinions and takes place at the correct corner of the table. They get a certain amount of disks. They prepare for the debate, collect arguments. When they say an argument, they have to put a disk on the table. When the disks run out, the debate is over. The strength of the arguments decides which opinion is correct.

7.9 The method of opinion line

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- a whole class

The description of the method:

This method develops the social skills: the social relationships of a class or a group.
Its aim is that the students should understand and assess of the tenderness of opinions.
Draw a line. One end of that line marks acceptance, while the other end represents refusal.
Along this line, everybody can place their disks according to their opinion.
Mainly those statements can be commented in this way that contains value judgement. The opinion line visualizes the single opinions.

7.10 Spend twenty Forints/Euros!

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- among groups
- a whole class

The description of the method:

This method develops the social skills.

Everybody gets token money in the amount of 20 HUF/EURO, e.g. 2 pieces of 5 Forints/Euros, one piece of 10 Forint/Euro.

Suggestions and possibilities have to be visualized in a place, which can be seen.

The students optionally support the suggestions with their money. In the end count the suggestions, the votes and set up the order.

7.11 Three-step interview

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- pair
- group
- among groups
- a whole class

The description of the method:

This method is suitable for sharing information.

It is a technique which can be used in all the three phases of the lesson and in which the partners should make an interview with one another about a given topic according to appointed roles.

The process of application

1 The formulating of the questions

2 The preparation of the interview

3 They exchange roles during the next step

4 A discussion of the result and experiences of the interview

Equipment applied during the activities

- Post-it, flipchart, instruments for writing, ball, name card, multi tack, wrapping paper, sheet A4

The process of control and evaluation

- Not necessary

7.12 A web diagram

Sources**:**

http://janus.ttk.pte.hu/tamop/tananyagok/ti_holocaust_dra/hromlpses_interj.html

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

http://english.tyhs.edu.tw/xoops/html/tyhs/teach_source96/01.pdf

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method is good for revision and sistematizing and also develops social skills.

The application of the web diagram as a graphic organizer:

- the members of the small group visualize their ideas regarding the content of the main concept, everybody individually,
- the group summarize their knowledge according to the appearing ideas about the topic of family roles in a web diagram

Web diagram

This is a more simple variety of the associative cluster diagram. It is a graphic organizer which helps the primary collection and setting of ideas, information, concepts, meanings and associations consociated with a central "call" (a concept, an expression, a problem or a question, etc.). We associate the content with the central expression and there is no logical connect search. Its usage is effective in the stage of "tuning" and – alike the cluster diagram – it can be completed individually, in pairs, in a group or together.

Equipment applied during the activities

- Computer, projector, interactive board/screen
- Post-it, flipchart, instruments for writing, multi tack, wrapping paper, sheet A4

The process of control and evaluation

- Not necessary

7.13 Prediction

Sources**:**

http://www.jgypk.hu/mentorhalo/tananyag/A_szvegfeldolgozs_elmlete_s_gyakorlata_als_tagozaton/611_mdszerek_s_munkaformk_a_szvegfeldolgoz_rkon.html

https://www.teachingenglish.org.uk/article/prediction

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops thinking and social skills.

- its function: creating an active reception attitude, arousing the interest
- the members of the group make statements according to the description of the picture and the model
- they "predict" statements in advance how the model can have an effect on the children/students according to the description of the model and the individual experiential cognition of pictures
- after reading the text they compare the predictions with the content of the text

Equipment applied during the activities

- Post-it, flipchart, model pictures, word cards, model descriptions

The process of control and evaluation

- Not necessary

7.14 Three go, one stays

Sources**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups

The description of the method:

This method is suitable for sharing information.

The groups get familiar with one another's work. The advance of it is that the results are represented simultaneously in several groups.

The process of application:

1.The children elaborate a certain topic in groups of four.

2.Three members of the group sit to neighboring group's table in order to get familiar with their work.

3.One member of the group stays in order to receive the three members of the other group and explain his/her own group's work.

4.After a while the host will change.

Equipment applied during the activities

- PPT
- Computer, projector, interactive board/screen

The process of control and evaluation

- Not necessary

7.15 TKT/ TTM

Source**:**

www.biharinepfoiskola.hu/kompetencia_eu/e107_files/downloads/.../TTM.doc

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups

- a whole class

The description of the method:

This method is for sharing information.

The purpose of this technique is that the participants attach their knowledge to the already existing, or rather they get more motivated to get familiar with the new material by articulating their own questions.

The process of application:

1. After naming the topic, we ask the participants to write a list in pairs about what they think they know about it.
2. The colleagues share their ideas with the others and the trainer writes the common elements on the board.
3. The trainer writes those elements upon which the participants do not agree in another column on the board.
4. While elaborating the new topic the trainer regularly make the students focus their attention on their own questions
5. The trainer writes those ideas that the students have just learned or answers referring to the students' questions in a third column on the board.
6. Finally, they should discuss those ideas the students have learned during the elaboration of the topic, though previously the questions did not focus on these ideas!

Equipment applied during the activities

- Instruments for writing, post-it, multi tack, wrapping paper, sheet A4
- Computer, projector, interactive board
- PPT

The process of control and evaluation

- Not necessary

7.16 The divided diary

Sources**:**

https://www.tankonyvtar.hu/en/tartalom/tamop412A/2009-0007_iskolaskor_pedagogiaja/TANANYAG/06_1_2.html

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

This method develops thinking.

Divide the writing surface used for taking notes (sheet of paper, exercise book) into two with a vertical line.

1. Note the cooperation possibilities/problems in the left column (a key word, an idea, a picture) which inspire you to formulate opinions.
2. Note in the right column those organizational frameworks/ways of solutions which suit the topics chosen in the left column.

Equipment applied during the activities

- PPT
- Instruments for writing, wrapping paper
- Computer, projector, interactive board/screen

The process of control and evaluation

- Presentations, their interpretations, active participation in group work

7.17 SWOT-analysis

Sources:

www.nefmi.gov.hu/letolt/kozokt/swot_uj_elemzes_2.doc

https://k12teacherstaffdevelopment.com/tlb/how-can-swot-analysis-be-used-in-the-classroom/

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops thinking. Its function is to unfold the strengths and weaknesses of an area and take the possibilities, dangers into consideration.

- The participants of the analysis fill in a chart that is divided into four windows and in which the four windows make possible the listing of the four aspects: *the strengths and the weaknesses* – (inner analysis) – *the possibilities and the dangers* – (outer analysis) -, and each group fill in different windows.

- After summing up, the charts filled in by the participants and the participants choose the most important factors from each pane. After this the exploration of the connections among the individual panes follows. During this process it turns out which further possibilities can be developed by the *strengths* and on which fields they can help stave the dangers off and what kind of *weaknesses* hinder the development of the possibilities and the staving the real dangers off.

Equipment applied during the activities

- Instruments for writing
- wrapping paper
- a thesis sentence
- a questionnaire for teachers referring to cooperation

The process of control and evaluation

- Presentations, their interpretations, active participation in group work

7.18 Mosaic learning

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://www.mosaiclearning.com/

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- among groups

The description of the method:

This method is a task-oriented work plan.

This is the basic form of the cooperative learning. We divide the big group into smaller groups of four. We also do this with the processed literature.

Each member of the cooperative groups elaborates different parts of the text and so they get some knowledge of an expert on a certain field.

The expert of a topic shares his/her knowledge with his/her partners.

The groups compare their ideas about a topic with one another's thoughts.

Equipment applied during the activities

- Post-it, wrapping paper, multi tack
- Processed literature

The process of control and evaluation

- Presentation, reflection, comparing the methods presented by the groups
- Active participation in the discussion regarding the importance of the choosing of the relevant methods

7.19 Reciprocal teaching

Sources**:**

http://www.magyarpedagogia.hu/document/Jozsa_MP1094.pdf

http://ofi.hu/sites/default/files/schoolbook/documents/Olvasas_betekintd394.pdf

https://www.cultofpedagogy.com/reciprocal-learning/

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group

The description of the method:

This method is for developing thinking and social skills.

Reciprocal teaching means groups of four children in the teacher's role.

Students in groups of four all have one copy of a given text.

1. Each student reads the appointed part of the text.
2. The group carry out four tasks in the following order:
   - Member 1 sums up what (s)he has read in the paragraph
   - Member 2 formulates questions in connection with the read text and asks them from the other members of the group
   - Member 3 clarifies the current argued parts
   - Member 4 makes a possible draft according to that part of the text
3. They write the draft on a piece of wrapping paper

Equipment applied during the activities

- Instruments for writing, multi tack, wrapping paper, sheet A4, the processed texts

The process of control and evaluation

- The presentation of the group work

7.20 Mind map

Sources**:**

http://www.tmt-tanulas.com/index.php?gondolatterkepek

http://www.mindmapping.com/

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group

- among groups

The description of the method:

This method is suitable for revision and sistematizing.

The mind map is a graphic organizer, which effectively helps the accurate text work nicely built in both structure and content. It is suitable for planning different kinds of texts (lecture, reflection, essay and dissertation) in both oral and written form.

The central concept can function as a title, with the help of the key concepts, which are connected to the central one we can articulate thesis sentences, while the information, reflections and remarks connected to the key concepts can serve as parts of a draft for articulating and justifying the thesis sentence.

The process:

1. Literature text theme definition – it goes to the centre of the mind map!
2. Looking for those aspects with the help of which the topic can be defined, examined and articulated.
3. Collect as many reflections, pieces of information and details of each aspect, as you can and possibly make a logical order of them.
4. Decide, what kind of order you follow during the text work (the introduction, sub-themes, how you connect the parts, the end of the text).
5. Use the mind map as a draft to make the text.

Equipment applied during the activities

- Computer, projector, interactive board to visualize the web sites
- Processed literature text, e.g.in student tutorials

The process of control and evaluation

- The presentation of the group work
- Students understand the connections of the theoretical material

7.21 Ball game with free association

Source:

www.pedagogusvilag.hu Pedagóguskiadás 3.old., Tudorka magazin melléklete XIX.évfolyam 7.szám

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- a whole class

The description of the method:

This method develops groups and social skills and also helps warm-up.

This exercise helps tuning up and also assists processing woes.

We stand in a circle and the one who throws a ball has to say an animal living in water, a bird, a mean of transport, a name, etc. It can be used for any concept in connection with the topic of the given lesson (eg. collecting nouns, common nouns, life phenomena, concepts in connection with environmental protection, preventing illnesses, etc.)

Those who are not succesful in saying a new concept have to stand on one leg until someone throws a ball to them again.

This exercise develops the focusing of attention, remembrance, motoric coordination, vocabulary and also creates a good atmosphere.

7.22 Speaking out – Ventilation 1

Source**:**

https://www.tankonyvtar.hu/hu/tartalom/tamop412A/2011-0094_neurologia_hu/ch07s11.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons

- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- a whole class

The description of the method:

This method develops groups and social skills and also helps warm-up.

This exercise is good to get ready for work. (With the help of this we can help children release tension and tune up.)

It can be used in lower classes, especially in class one. At the beginning of the day, we sit in a circle and we pass a toy bear around that signs who can speak. Everybody can say a sentence about what positive thing happened tothem at weekend or what negative thing happened that morning. it is a very good exercise to release tension and negative experiences and to tune up to that day.

7.23 Ventilation 2 – Backpack

Source**:**

www.pedagogusvilag.hu Pedagóguskiadás 3.old., Tudorka magazin melléklete XIX.évfolyam 7.szám

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual

- a whole class

The description of the method:

This method helps stress management and warm-up. This exercise is good to get ready for work. (With the help of this we can help children release tension and tune up.)

Exercise: „Write on a piece of paper why you can't listen in Science lesson! Note down every idea that is in your head and what you feel! (headache, sadness, fear, Mum's angry with me, … etc.) then fold the paper as small as you can and put it in your pocket. While folding it, the problem is getting less and less important and these ideas, these feelings are rolling away, we feel OK and we can listen again."

7.24 Ventilation 3 – Drawing

Source**:**

www.pedagogusvilag.hu Pedagóguskiadás 3.old., Tudorka magazin melléklete XIX.évfolyam 7.szám

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- a whole class

The description of the method:

This method helps stress management and warm-up.

Exercise: "Make a strip cartoon about this morning. Draw what was good and bad about it. You can draw speech bubbles to the characters as well. You can write in them those sentences which occupy you."

By this exercise the children can be outside their problems, they roll away from their problems a bit, if they speak them out, draw them. We divert their attention from their hardships and reinterpret the significance of them.
It helps motivating, tuning up, processing and releasing woes.

7.25 6/3/5

Sources**:**

http://www.innosupport.net/uploads/media/HU_4_3.pdf
http://www.becreate.ch/en/methods/6-3-5-method.aspx

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups and social skills and also thinking.
Each of the six participants write down three ideas or solutions to a given problem side by side on an empty piece of paper. After this the groups / the participants give clockwise the paper to the next person / group. They write down their own ideas in the second line. The pieces of paper go on clockwise until they return to their starting point – in this way in each opportunity 6 times three ideas are given five times (6-3-5). During one turn maximum 108 ideas can emerge or – in an ideal case – 18 thorough ideas. A requirement: the concrete matter or question should not be too complicated. It is also useful to limit the time (1-5 minutes) for passing the paper the next person / group.

7.26 A tree of ideas

Source**:**

http://kezdotanaroknak.blogspot.com/p/tantargy-ido-munkaforma-eszkozok.html

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method is suitable for revision and sistematizing, but also develops groups and social skills.

Here a group work is supposed. This is a graphic method – we write the key word / topic / concept down under, in the middle, in a square and all the knowledge connected with this comes on it, just like the branches of a tree. The members of the group can read their companion's ideas and they complete them.

The advantage: it is a new organizing and knowledge systematizing form.

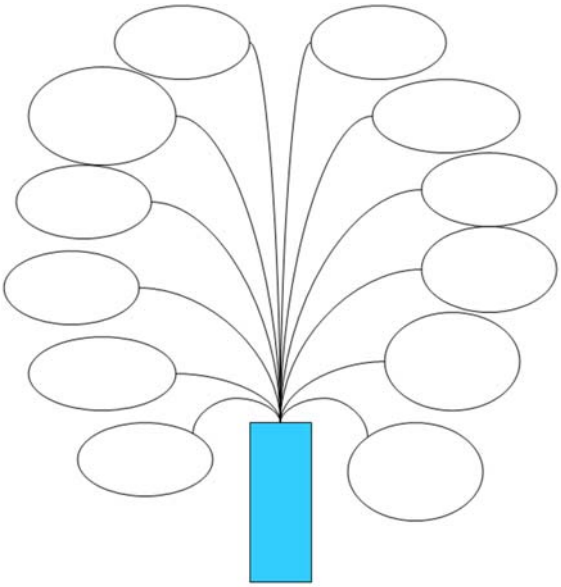


Figure 39: A graphical drawing of a tree of ideas (forum .portal edu.ro)
Source: http://forum.portal.edu.ro/index.php?act=Attach&type=post&id=2140939

7.27 The lotus blossom method

Sources:

http://ovodaivilag.hupont.hu/32/kooperetiv-modszerek

http://www.andyeklund.com/brainstorm-technique-lotus-blossom/

The duration of the method:

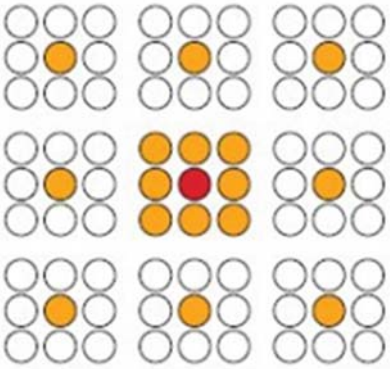
- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups, social skills, thinking and it is also a task-oriented work plan. We draw the central problem in the middle of the sheet of paper. Then the group thinks about eight topics or components or dimensions that they write around the square, in the circles. Then they think about again eight topics in connection with each of the existing eight topics, and then they do the same thing with the existing 64 topics and so on. These partial approaches follow the 1,8,64,512 sequence, if the children manage to write additional eight topics to each partial problem. This method has got the name “lotus blossom” after its drawn picture.



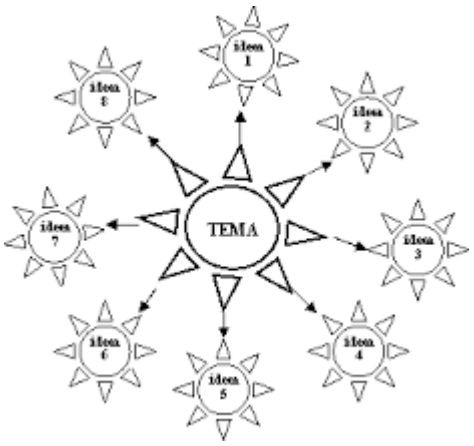


Figure 40: The principle (left) and the drawing of a lotus blossom (http://kreativ.hu/magazin_reklam/cikk/jo_a_brainstorming__de_erre_igazan_nincs_ido)

7.28 The method of the six thinking hats

Sources:

http://ovodaivilag.hupont.hu/32/kooperetiv-modszerek

https://www.mindtools.com/pages/article/newTED_07.htm

The duration of the method:

- a whole lesson
- a lesson between lessons

- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups, social skills, thinking and it is also a task-oriented work plan.

In the Figure 26, the method of six thinking hats is presented.

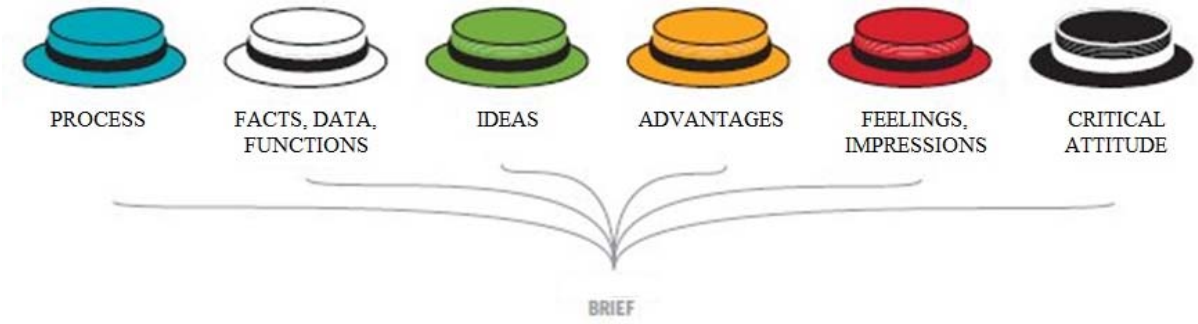


Figure 41: The six thinking hat method
(http://kreativ.hu/magazin_reklam/cikk/jo_a_brainstorming__de_erre_igazan_nincs_ido
http://prelmelet.blogspot.com/2013/10/hat-gondolkodo-kalap-egy-mod-sikeres.html)

The basis of this method is the statement that a person can concentrate on only one thing at a time.

Psychologist Edward de Bono invented it (https://archive.org/details/sixthinkinghats00debo).It bases on parallel thinking in the way that – in order to achieve the same goal – everybody concentrates on only one aspect of the same problem at a time. The six hats of six different colours symbolize the several approaches of a problem or idea:

The blue hat represents the process, the white hat the facts, the data and the functions, the green hat the creativity (the ideas), the red hat the feelings and impressions, the yellow hat the advantages, the black hat the objections (critical attitude).

It is useful to have an agreement beforehand on the sequence of the hats, because there is no previous rule for that.

In the Table 4, the functions of each hat are presented.

Table 4: The tasks of the six hats

White hat	Red hat	Yellow hat	Black hat	Blue hat	Green hat
What do I know? (facts -objectively) Which pieces of information are missing?	I feel about it in this way. (e.g. I do not like the process, etc.)	What are the advantages? If we start it in this way … we can expect a good result.	Mistakes, dangers (negative judgement)	Let's sum up … What is the next step? conclusions	Alternative solutions, new ideas Has it got another solution? The secret of success is that ….

With the help of this thinking method, the time dedicated to decision making can radically be reduced and the number of the adaptable ideas can be multiplied.

7.29 The cube

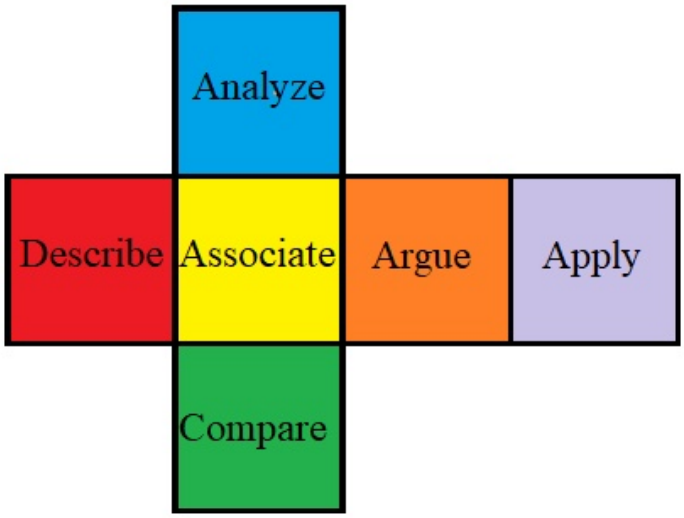


Figure 42: The "Cube" method

Sources:

http://epa.oszk.hu/00900/00939/00110/2009_10_06_00110.htm

https://rjas.ro/.../paper_version.paper_file.a8c21f682e049382.626f61...

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups, social skills, thinking and it is also a task-oriented work plan. The usage of this method helps approach one topic from several different points of view. We create groups of 6. Everybody does that task they randomly get (which are on the sides of the cube) at a given time. Then the groups present their ideas.

7.30 „Indian talk" method

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson

- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- a whole class

The description of the method:

This method develops social skills. We use it at group discussions.

The idea bases on the story that the young Indians always started their remarks with repeating the previously speaking old ones' sentences and ideas. It helps the conscious attention to the other's sentences, improves the ability of circumlocution, the highlighting of essence and the conscious communication. While using it, the contributors start their speech with summing up the previous talk**.**

7.31 Torpedo

Source**:**

https://tka.hu/tudastar/mogy/690/kollokacios-torpedo

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups
- a whole class

The description of the method:

This method develops groups and social skills.

Table 5 presents the logic of "Torpedo" method.

Table 5: The field of the "Torpedo "method

	A	B	C	D	E	F	G
1							
2							
3							
4							
5							
6							
7							

There is always one guard fewer (who has the exercises) than the numbers of the groups. The groups always watch which guard is free and they run up to her/him. They try to "shoot" (e.g. A5) and solve the question / exercise that they find on that field. If it is an empty field, they can ask about a neighboring filed whether there is an exercise there. The winner is that group that can find and solve all the questions of the selected fields during a given time (e.g. in a form of an airplane, etc.)

7.32 Twenty questions

Sources**:**

http://ujalma.hu/wp-content/uploads/2012/01/jatekgyujtemeny_tanaroknak.pdf

http://www.socialstudies.org/sites/default/files/publications/se/6506/650609.html

The duration of the method:

- a part of a lesson

- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- a whole class

The description of the method:

This method develops social skill, the relationships in a class and thinking.

It is an excellent thought-provoking game. Any age group plays it with pleasure. This game doesn't need any preparation or devices.

Interdisciplinary fields:

Mathematics: aggregation, improving logical thinking

Hungarian Grammar: using concepts, forming yes-no questions

It is practical to be used at the beginning or at the end of Science lesson.

7.33 True or false statements

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- among groups
- a whole class

The description of the method:

This method develops groups, the social relationships in a class and it is also a master method. It is very suitable for revising a given topic during a short period of time or recalling old knowledge.

Children like it. They can move, laugh and race with one another.

They put their arms on the desk. If there is a true statement, they have to raise their arms, if there is a false one, they leave their arms on the desk.

Pawns can be collected during the game, which can be given back at the end of the game by giving right answers. There can be a knockout version of it as well. The forms of movements can be changed as well, e.g. standing when the statement is true and squatting if it is false, etc.

It improves memory, concentration ability, logical thinking, combinatorial ability, reading comprehension.

8 Project - based methods

8.1 Roundtable method

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups and it is also master method.

It is for collecting information according to the rules of word spinning.

The children can collect words, numbers, rules according to a given aspect, topic, etc.

You can control the speed e.g. passing, time limitation, etc.

You can make it more difficult if more sheets of paper are circulated with similar or different task.

8.2 Spinning report

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups
- a whole class

The description of the method:

This is a master method and also for sharing information. It is a systematic method, which is used to close a topic.

Each group get a sheet of wrapping paper with a different (or the same) topic on it.

The groups (writing with a pen of a unique color) write words, expressions connected to a topic for 1-3 minutes. To a given signal, they go to another sheet of paper. They have limited time – only some minutes – to read and complete the words and thoughts, which are there.

If they do not understand something, they can question that. It goes on and on until they get back to their own sheet of paper. They discuss the corrections, the completions and question marks. Then they discuss each topic separately. The group work can be followed well by the colors.

8.3 More students at the board

Source**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups
- a whole class

The description of the method:

This method is for sharing information.

Time after time one student from each group writes the group's important ideas on the board, while the other members work on.

8.4 Window

(See 7.1)

8.5 Sending and exchanging tasks

(See 7.3)

8.6 A quartet of students

(See 7.4)

8.7 Control in pairs

(See 7.6)

8.8 Disks of speaking

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual
- group
- a whole class

The description of the method:

This method develops social skills.

Everybody gets the same number of disks. When they make a remark, they put one disk in the middle of the table. Nobody can make another remark until each member of the group puts one disk in the middle. Those who run out of the disks cannot make a remark any longer.

8.9 Group discussion

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a whole lesson

- a lesson between lessons
- lesons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

This method develops thinking.

This is a free discussion of the members of the group, in which they share their ideas with one another.

8.10 A cooperative debate

(See 7.8)

8.11 Spend twenty Forints/Euros!

(See 7.10)

8.12 Three-step interview

(See 7.11)

8.13 A web diagram

(See 7.12)

8.14 Prediction

(See 7.13)

8.15 TKT/ TTM

(See 7.15)

8.16 SWOT-analysis

(See 7.17)

8.17 Mosaic learning

(See 7.18)

8.18 6/3/5

(See 7.25)

8.19 A tree of ideas

(See 7.26)

8.20 The lotus blossom method

(See 7.27)

8.21 The method of the six thinking hats

(See 7.28)

8.22 The cube

(See 7.29)

8.23 „Indian talk" method

(See 7.30)

8.24 Torpedo

(See 7.31)

9 Methods helping teamwork at school

9.1 Brainstorming

Sources:

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

https://www.mindtools.com/brainstm.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

This method is for developing groups, social skills and thinking.

This method serves to collect ideas within the group. Everybody can tell his/her thoughts and opinions. They can freely associate on the raised issue.

The children write down the ideas then they highlight and discuss the important ideas. The extreme ideas become final solutions.

This method helps the associative skills and expands the knowledge.

9.2 Word spinning

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

Thsi method develops groups and it is also a method for sharing information.

This method is suitable for collecting expressions, concepts and directed communication.

The members of the group one after the other in a pre-arranged order say words, concepts and features about a given topic. They can say only one argument, word, expression, thought, etc. In this way everybody takes his/her turn: there is no dominance in the group.

9.3 Word spinning in pairs

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons

- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair

The description of the method:

This method is for sharing information.

The members of the pairs turn to each other and alternately recite expressions, words and their thoughts.

9.4 Twin speaker

Sources**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair

The description of the method:

This method develops thinking and social skills.

We can apply if our aim is not listing or collecting concepts, but we would like the children to think deeper.

The members of the pair turn to each other, and for a while (approx. for a minute) they discuss a given topic. During that time, the partner listens and does not interrupt the other one.

With the help of this method, we can develop the children's compositional skills and their attention to each other.

9.5 Word spinning in groups

Sources**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method develops groups and socil skills.

The groups – according to the rules of word spinning – report about the given task or issue.

The students can develop those social skills, with the help of word spinning and the twin speaker that are not surely learned in an ordinary lesson.

They learn how to listen to and respect one another. Since everybody can take a remark, not only those who perform well, the meta-communicational message of the lesson is that all remark is valuable and unique, not only of those who perform well.

9.6 Group interview

(See 7.2)

9.7 Collage cube method

Source**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

This method is for revision and sistematizing.

It visualizes the knowledge that can be expanded, corrected and used more than once e.g. to revise, to sum up.

We make a cube out of a paper band (or we use a ready-made one). We fill in the sides of the cube with collages of pictures or words referring to the needed information, in the suitable size. If these collages are ready, we glue them on the sides of the cube. This cube can be used to introduce ourselves or to sum up topic through its logical elements.

9.8 Sending and exchanging tasks

(See 7.3)

9.9 A quartet of students

(See 7.4)

9.10 A simultaneous quartet of students

(See 7.5)

9.11 Control in pairs

(See 7.6)

9.12 Disks of opinion

(See 7.7)

9.13 Disks of speaking

(See 8.8)

9.14 Group discussion

(See 8.9)

9.15 A cooperative debate

(See 7.8)

9.16 Spend twenty Forints/Euros*!*

(See 7.10)

9.17 A blind caterpillar

Source**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group

- a whole class

The description of the method:

This method develops groups.

The members of the group line up behind each other (each group separately). Everybody stands with eyes shut, except for that student who heads the line. The first person – who has the open eyes – freely directs their group in the room. After a while, they exchange roles in order to experience both roles.

Dangers while applying this method

-"life education" may go to the expense of processing the curriculum,

-students may set back one another, students with better skills cannot proceed at their own pace,

-students may say bad answers to one another,

-students may not deal with the task,

-the teacher may not control the situation (noise, organizational difficulties),

9.18 Three-step interview

(See 7.11)

9.19 Web diagram

(See 7.12)

9.20 Prediction

(See 7.13)

9.21 Three go, one stays

(See 7.14)

9.22 TKT/ TTM

(See 7.15)

9.23 The divided diary

(See 7.16)

9.24 Mosaic learning

(See 7.18)

9.25 Reciprocal teaching

(See 7.19)

9.26 Mind map

(See 7.20)

9.27 Building a sculpture

Source**:**

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- among groups
- a whole class

The description of the method:

This method is for developing groups.

There are cut pieces of a sculpture group in an envelope and the students have to put them together and glue it on a sheet of paper (each group get a different picture). Then students write down, what they can see in the picture, how they feel about it, what are the characteristics of the picture. (This task is suitable for introducing and observing different literary historical, historical and art historical eras and styles.) After this, a spokesperson reads out the product, the group has created. When all groups have introduced their own products, the groups try to „copy" their group of sculpture and they stand in a formation, as if they were

the sculptures of the group. They also tell their experiences and reflections in connections with it.

9.28 Same – different

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf
https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair

The description of the method:

This method develops social skills.

Pairs are sitting back to back to each other, they cannot see each other, but they can talk. Both members of the pair get the same picture. The members alternately tell each other what they are seeing in the picture, in this way they try to find what are the differences between the two pictures.

9.29 Visiting a gallery

Sources:

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf
https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

http://www.jgypk.hu/mentorhalo/tananyag/A_szvegfeldolgozs_elmlete_s_gyakorlata_als_tagozaton/613_kooperatv_mdszerek_technikk_feladatlersok.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- among groups
- a whole class

The description of the method:

This method is for sharing information.

The groups observe the work of the other groups. They discuss what they have seen and evaluate the pieces of work. (This task can be carried out in fields as well: children can make some compositions from raw materials they find in nature, e.g. out of chestnuts, fallen tree branches and leaves.)

9.30 Imitating motions

Source**:**

http://ofi.hu/tudastar/oktatasi-nevelesi/kommunikaciofejleszto

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

This method develops groups and also helps warm-up.

This exercise helps tuning up and also assists processing woes.

We stand in a circle and a student starts a motion (e.g. he/she scratches his/her chin). Everybody imitates this person and in the next round, we add a new motion to it (e.g. a smile) After imitating both motions, we go on with a third one and we continue until 7-8 motions (e.g. stretching, sitting on their heels) The game improves the focusing of attention, remembrance, empathy and creates a good atmosphere.

9.31 Speaking out - Ventilation 1

(See 7.22)

9.32 6/3/5

(See 7.25)

9.33 A tree of ideas

(See 7.26)

9.34 The lotus blossom method

(See 7.27)

9.35 The method of the six thinking hats

(See 7.28)

9.36 The cube

(See 7.29)

9.37 „Indian talk" method

(See 7.30)

9.38 Torpedo

(See 7.31)

9.39 Twenty questions

(See 7.32)

9.40 True or false statements

(See 7.33)

10 Terrain activities

10.1 A blind caterpillar

(See 9.17)

10.2 Prediction

(See 7.13)

10.3 Three go, one stays

(See 7.14)

10.4 Drama and situational game

Sources**:**

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

https://www.stagemilk.com/acting-games/

The duration of the method:

- a whole lesson
- a lesson between lessons
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

This method develops groups and socil skills.

It is a common problem that students can get close to the real message of the curriculum very hard: they cannot empathize with what they are learning about. The drama can be applied effectively in all the three phases of the learning process, but occasionally a drama lesson can be organised as well, regardless of the forms and frameworks of the drama module fixed in the pedagogical programme. The drama can well introduce or visualize a historical event, or in literature lesson, it can be a device to get closer to pieces of art, but it can be also well applied in other fields of self-improvement, regardless of the occasion and topic. For example, if the aim is to improve the children's empathy, i.e. they should sympathize with a historical situation from a humanist point of view (e.g. a gladiator's one day) or if the students can get close to the real message of the curriculum very hard, then they can visualize different situations.

In drama, the elements of dramatic process can be recognizable like visualisation, imitation, social correlation and action. It improves creative abilities, flexible thinking, the ability of concentration, social skills, develops physical-spatial security, speech purity and its expressiveness and it also gives a courage of behaviour in several fields of life.

10.5 Still picture

Source**:**

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

This method is for developing groups and social skills.

With the help of still pictures, we can make our lessons more colourful, more various and it well improves the feelings of mutual interdependency and trust and the ability of making consensus.

For example: "A poem is very similar to a picture that is why it is very easy to make still picture out of lines of a poem. Each group visualize its own line of poem in a form of a group of sculptures. Since two groups have got one line, the same poem is visualized in two different ways. By the sound of a clap everybody stays silent and empathize with their own role, for example they are thinking about being ice-cold sand and they will never forget the poem titled *Négysoros* from János Pilinszky" (this is a quotation from an essay of Boglárka Gruchmann, a student learning Hungarian Literature and Grammar).

This method can be also carried out in fields, e.g. imitating a plant or animal: who/what am I from the forest?

10.6 Building a sculpture

(See 9.27)

10.7 Data sheet

Source**:**

http://janus.ttk.pte.hu/tamop/tananyagok/koop_tech_oj/ii__a_kooperatv_tanuls_mdszerei_grafikai_szervezk.html

The duration of the method:

- a part of a lesson
- a whole lesson
- a lesson between lessons
- lessons and/or periods between lesson
- lessons following one another
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- pair
- group
- among groups
- a whole class

The description of the method:

This method is good for revision and systematizing.

A data sheet can be made about objects, plants, animals and a person. (This method can be used as a preparation of field activity, e.g. we write on a piece of paper or a card some data of a plant or animal and the students have to find them in the field according to this paper or card.)

For example, if we use data sheet for processing a narrative, then the members of the group can make it about the characters of the text.

The students get only the names of the characters and they cannot read the text yet. They can collect data about the age, sex, occupation, address, hobby etc. of the characters. The filling of this data sheet is left to their imagination. Then two members of the group will change their places with two members of another group and they share the content of their data sheets with one another. What is this good for? It improves their imagination and arouse their interest for the text.

10.8 Pass the motion!

Source**:**

http://fejlesztok.hu/images/modszerek/kooperativ_technikak.pdf

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

This method develops groups.

The group is standing in a circle. A member of the group is showing a random motion (it can be a motion of a plant or an animal as well) that the others have to imitate. The game is going on, until everybody has imitated the motion.

10.9 Same – different

(See 9.28)

10.10 Visiting a gallery

(See 9.29)

10.11 Find your place!

Source**:**

http://kemeny-eger.sulinet.hu/public/doks/kooperativ_tanulas.pdf

https://www.scoop.it/t/mentselftelvoidua/p/4083815129/2017/08/28/kagan-cooperative-learning-ebook-free-download

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- individual

The description of the method:

This method develops thinking.

In the room (or in the field) pre-identified locations or corners should be designated. Every student gets a card, on which they can read a word that is in connection with the designated corners. The students find their place and stand there. (This game can be made more colourful with hiding the cards that the children have to find.)

10.12 Imitating motions

(See 9.30)

10.13 Rainmaker

Sources**:**

Tappancs 173.sz.XIII. évfolyam 9. sz. 3. old. Pedagóguskiadás

http://www.nyeomszsz.org/orszavak/pdf/DemenyDramaval3resz%5B1%5D.pdf

The duration of the method:

- a part of a lesson
- lessons and/or periods between lesson
- regular or constant method during lessons
- one occasion out lessons
- a method with a defined lenght outside lessons
- regular or constant method outside lessons

The possible work forms of the method:

- group
- a whole class

The description of the method:

This method is for developing groups.

This exercise helps tuning up and also assists processing woes.

We stand in a circle and ask the children to imitate us. The teacher standing in the middle of the circle, shows the different motions. The children imitate this, until we show another motion. This motions could be for example:

- rubbing the palms,

- snapping with the thumb and the big finger alternately on the left and the right hand,
- beating the thights rhytmically,
- jumping up in the air, stamping wtih the feet,
- snapping,
- rubbing the palms.

The game improves the attention, the sense of rhytm and also creates a good atmosphere.

LESSON PLANS

We are all familiar with the phrase *We only have one planet, so it's time to start caring!* But, unfortunately, there is a low proportion of people who are actually aware of it. That's why it is important that even young children have knowledge of nature, but it is essential that this knowledge should base on experiential learning.

This handbook provides teachers with the opportunity to develop environmental education themes built on the framework curriculum with elaborated thematic lesson plans.

We are aware that most of the teachers have *limited resources*, which can make their job quite a challenge and that most of the teachers do not know how to put environmental education into their subject. To do this, we tried to help and develop lessons that can be used for any subject. In every lesson, we planned the exact course of the lessons, the teaching methods used in the course, the purpose of the lesson, the didactic tasks. For the less experienced teachers, it can also be a useful resource.

The lesson plans have a general structure that is typical of any type of lessons.

1. Introduction: provides interest and motivation to the students. It focuses students' attention on the lesson and its purposes. It also convinces students that they will benefit from the lesson.
2. Objectives: write precise and delineated goals for what you want your students to be able to accomplish after the lesson is completed.
3. Procedures: it is the body of your lesson plan, the ways in which you will share information with students and the methods you will use to help them assume a measure of mastery of that material. The three stages (a motivational opening, the development of the lesson, and the closing), although instructional in nature, can also involve some formal or informal assessment periodically.
4. Closure, evaluation: is the time when you wrap up a lesson plan and help students organize the information in a meaningful context in their minds. This helps students better understand what they have learned and provides a way in which they can apply it to the world around them.

Each lesson plan includes aspects of environmental education based on experiential learning. By doing so, the lessons are colorful, interesting and useful.

The lesson plans can thus be used to improve students' environmental sensitivity and to understand the importance and potential of recognizing, mitigating and preventing local, regional and global environmental problems. As a result of awareness-raising, students need

to be aware that Earth is a fragile ecological system whose conservation is a shared responsibility of present and future generations.

11 Everyday aspects of life in a built environment

SCHOOL: Lendvai - 1st bilingual primary school		**Subject:** Hungarian language
Class: 3.-5.	**SCHEDULE**	**Year:** 2017/2018
Areas: - natural sciences - **social sciences** - arts - technique	**Preparing a Nine Men's Morris**	**Number of classes:**

Topic: Everyday aspects of life in a built environment – Recycled materials
Topic of the class: Tasks that help in understanding the text: Preparing a Nine Men's Morris
Objective of the class: • developing the skills of accepting and creating the non-artistic texts, • recognise they can collect information from the text and can learn from it, • by reading the text loudly and mutely they are improving their reading technique and the capacity of understanding reading, • practising the individual task-solving and context telling, • developing the text-making capacities, • preparing a game from waste.
Type of class: class with new information
Subject's correlation: Technique, mathematics

Development of key competences:
• communicating in one's mother tongue
• communicating in a foreign language
• mathematical, writing-reading and natural-science-related information
• digital competences
• learning how to learn
• social and citizenship-related competences
• spirit of initiative and entrepreneurial competences, including the following:
  o creative thinking
  o risk assumption
  o capability to plan and realise projects (from the idea to the action)
  o critical way of thinking
  o problem-solving skills
• cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - individual	- game - explanation - discussion - description - work with printed text	- work-sheet - cardboard of approx A3 - 2 kinds of plastic caps - pencil - ruler

WORKING PROCESS

	Teacher's activity	Student's activity
Introduction **5 minutes** **1. Motivation:** **3 minutes**	**Conversation** The teacher is bringing some games for the class activity. He asks the children what games they know and how they can be procured. Who likes to play games? What games do you know? Where do you procure the games? **Motivation** Children always liked to play with games. What do you think - in the old times when it was not possible to buy so many games in the shops – how the children could get their games? **Brainstorming** We are drawing a cloud onto the board and we put the word "game" in it. It will be surrounded by the key-words listed by the students. We are looking for the answer that we ourselves can create our own games. How could we create these games?	The students are answering the questions. They are listing the games they know. They are telling with whom and how they are playing. They are telling where they are procuring the games, from whom they are getting them or where they are buying the games. The children are telling their opinions how the children used to get their games in the past. Answering the questions.

Discussion **1. Objective:** **2 minutes**	Today you are going to read about the preparation and steps of an old game that can be played in pairs. I am sure many of you already know the game but please read the text carefully and solve the tasks.	The students are reading carefully the text and are solving the tasks.
2. Task of understanding the text: **25 minutes**	The students are working on their own. The teacher is watching them. *The student finishing with his task earlier can try his new knowledge with the nine men's morris.	
Finishing **1. Evaluation:** **10 minutes**	**Checking:** In the last part of the class we are checking the tasks frontally. As for the homework prepare the board required for the game based on the picture. Instead of caps you can use old buttons or some other small items. The main thing is that you require 9 pieces of identical colours for each.	Every student is checking his own task-sheet.

SCHOOL: Zrínyi Miklós-Bolyai János Primary School		**School subject:** Technology
CLASS:5	**LESSON PLAN**	**School year:** 2017/2018
Field of Science: - Natural Sciences - Social Sciences - Arts - Technology or I.T.	**Garbage in our environment**	**Lesson number:**

Main topic: Everyday aspects of life in a built environment – Environmental protection
The topic of the lesson: Garbage in our environment
The goals of the lesson: • Increasing environmental sensitivity • Shaping environmental-conscious thinking and behaviour • Raising the awareness of the importance of selective garbage collection • Incorporating the learned knowledge in everyday life • Didactic task: Teaching, learning, applying and fixing new knowledge during the lesson. • Educational task: Cooperation within the group, listening to one another's opinion, recognizing cause and effect relationships
Lesson type: a lesson of processing and applying new knowledge
Subject correlation: Science, Art, Foreign language
Developing key competences: • **Communication in mother tongue** • Natural Scientific competence • **Efficient and independent learning** • **Social and civic competence** • Initiative and venturesome competence **Developing transversal competences:** • **Acquiring independent learning** • Social competences • **Cooperative activity** • **Critical thinking and reflection** • **Digital competence**

Teaching forms	Teaching methods	Teaching devices
- frontal - individual - group	- explanation - discussion - demonstration - mosaic learning - practical work - the method of opinion line	- puzzle (magic square) - ppt - text - garbage - garbage bags - bins - rubber gloves - disks of opinions

WORKING PROCESS

The process of the lesson

	Teacher's activities	Pupils' activities
1 Designation of the purpose of the lesson, organizing work at the beginning of the lesson **5 min.**	(S)he describes the topic and the purpose of the lesson. (S)he helps with forming groups of 3 or 4 and controls the preparation of the necessary devices.	They form groups of 3 or 4 and prepare the necessary devices.
2 Motivation: Puzzle The solution of the puzzle is the motto of the lesson: *Junk is a problem but garbage can be valuable.* **3 min.**	Handing out the exercise sheet which contains the puzzle, discussing the solution.	They solve the puzzle and define the solution individually and discuss the meaning of the solution together.
3 Recalling the pupils' previous knowledge in connection with the topic: with the help of a ppt	(S)he presents a ppt which helps clear up the difference between the concepts of garbage and junk and other key terms like illegal landfill, selective garbage collection, recycled garbage. (S)he controls the cooperative opinions.	They listen and formulate cooperative opinions in connection with the slides.

Brainstorming: How can garbage be made out of junk and what can we do with the unnecessary things, have you got some home experiences in connection with this? **8 min.**		
4 Mosaic learning: Getting familiar with the concept of ecological footprint **8 min.**	(S)he hands out parts of a text depending on the numbers of group members because within a group everyone gets a different part of the same text about ecological footprint. (S)he controls the common discussion.	They read the text parts and share their acquired knowledge with one another. Finally – with the teacher's control – they sump up the knowledge acquired in the group together.
5 Applying what has been learned: Modeling reality: sorting out garbage in the suitable bins. **8 min.**	(S)he walks around in the classroom, helps and controls the work of the groups.	They sort out the unsorted garbage in the suitable bins.
6 Summing up the topic of the lesson: Discussing the acquired knowledge about selective garbage collection, recycling and ecological footprint. **6 min.**	Controlling discussion.	They join the discussion.
7 Evaluation with **the method of opinion line** What do you think: was the lesson interesting?	The teacher writes the three questions that help evaluation and draws the three evaluating scales on the board.	The groups briefly discuss their answers to the questions then put their disks on the scales.

Do you find your work efficient both individually and within your group? Did you learn new things that you can use in your life? **5 min.**		

Notes: In case of groups of 3 text parts 3 and 4 of the text about ecological footprint can be contracted. The text mentioned at the sources is in Hungarian but teachers can choose freely another relevant text or article in another language which is about the concept of ecological footprint.
Homework for the pupils:
Attachments: • puzzle (magic square) • ppt • text (ecological footprint)

8 Organizing work at the end of the lesson: Tidying up the classroom, packing up devices **2 min.**	(S)he controls and helps tidy up the classroom and pack up devices.	They tidy up the classroom and pack up devices.

SCHOOL: Scoala Gimnaziala "Szentivani Mihaly"		**School subject:** Civic Education
CLASS: 4.	**LESSON PLAN**	**School year:** 2017/2018
Field of Science: Man and Society - Natural Sciences - Social Sciences - Arts	**Our home**	**Lesson number:**

Topic: Everyday aspects of life in a built environment – The local community
Topic of the class: Human communities
Objective of the class: • Recognition of people's affiliation (local, national,European) • recognise they can collect information about people's affiliation • practising the individual task-solving and context telling (Find the settlements belonging to the village and be able to showthem, to identify River Nyarad and Mountain Bekecs, mark on the map Maros County and Galesti, recognize and list the higher buildings they can see from thehillside, give a free opinion on the usefulness/harmfulness of the bear • Identification of the essential elements of community affiliation
Type of class: mixed/ combined
Subject's correlation: Technique, Natural science
Development of key competences: • communicating in one's mother tongue • social and citizenship-related competences • spirit of initiative and entrepreneurial competences, including the following: o creative thinking o capability to plan and realise projects (from the idea to the action) o critical way of thinking o problem-solving skills • cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - individual	- conversation - explanation - discussion - evluation	- work-sheet - empty map - pencil

Working process

Stages	Learning Content	Procedure (teacher's activity)	Students' activity	Techniques	Evaluation
Introduction (warm-up)	Preparation for hiking	- Children, today, we			

	Hiking	observe our home village, Nyárádgálfalva from the hillside. We go out through the garden of the school to the hillside next to the cemetery. From there you will see the village with its magnificent buildings. Have you ever been there? - I think we should choose a tour guide who guides us during the walk. Let's form two columns. As you come down the hillside, you take a look at the landscape.	Students are preparing for the walk. -Yes. Students choose a tour guide who lives nearby and knows the neighborhood best. They are going to the planned destination.	Conversation	
Topic processing	Geographic observation	-What do we see? - What is the shape of the village like? -Which are the surrounding villages that you can see from here? -These villages are administratively belonging to our village and	Some students list what they see in the distance. -It is rather long. Some students list what they see in the distance. -It is rather long. Students list the 5 villages in the distance. Students are responding.	Observation, conversation	

		there is another village that we should mention. Who knows which village am I speaking about? "We also have a river that passes through us, and everybody knows the name. Which river is it? - There is also a mountain nearby with a height of 1078 m. Who can	- Nyárád. - Bekecs Mountain. Nyárádszereda.		Whole Class
	Mark the place on the empty map Game Building observation	show us and tell its name? - You can see from here the nearest town, when you look to the left. Can you recognize it? What is its name? Has everyone of you been there? -Who can tell me the name of the county we live in? - What is our country name? - I've also brought you an empty map that we are now examining and marking where our village is located. - Now we are going to play a game: Let's	-We live in Maros County. -Romania. The students find on the empty map the county and the village where they live. - My address is: ..... I live in ..... (country) ..... (country) ..... (the village's name), ... street, ... number. This is repeated by several students.	demonstration Conversation, observation	individual individual

	Maize fields observation Conversation on bears	pretend that you are lost and you have to explain to a stranger where you live. This is very important, everyone should know it. Tell your address. You can also add street name and house number! -What kind of buildings can we see? -Where do people live, I mean us? -What do most people do? -Where do the farmers work? -What do your parents produce? -Do you see maize fields? -Show me where you see it. "What could have happened ?, it seems as if they were ruined. Do you know what the reason is? -Unfortunately, it was the bear, indeed. Do you think the bear is our friend or our enemy?	- Schools, churches, cultural homes, blocks of flats. People live in houses. -Most people work in agriculture. -They work on the field. -They produce corn, wheat, barley and vegetables. -Yes. The students show the maize fields. -The bear has ruined it. Students relate stories about bears.		Whole class

		-The bear has done a lot of damage in the area lately, and even many times in the village. Have you heard such stories? Bears do a lot of damage to the man's work, indeed, and they could be very dangerous, because they can attack us if one gets into the road. What do you advise for the farmers or for hiking people?	Students list their recommendations: what one should or shouldn't do when they see bears nearby.		
Follow-up	Singing along	-Our trip ends here. We are going to sing along back to our school...as you know, there are many songs about our village.	Students are singing on the way back to school. (Songs: Bekecs alatt Nyárád tere, Zavaros a Nyárád)	Singing	Whole class

12 Healthy lifestyle

SCHOOL: Lendvai - 1st bilingual primary school		**Subject:** Natural sciences
Class: 3.-5.	**SCHEDULE** **Motion**	**Year:** 2017/2018
Areas: - natural sciences - social sciences - arts - technique		**Number of classes:**

Topic: Healthy lifestyles

Topic of the class: Motion

Objectives of the class:

- examining the motion-relationships between the animals and humans,
- stating the similarity and difference between the animal and human motions,
- learning that every living creature is made of cells and it is moving,
- learning that we move aided by our skeleton and joints.

Type of class: introductory class

Subject's correlation: Hungarian language,

Development of key competences:

- communicating in one's mother tongue
- communicating in a foreign language
- mathematical, writing-reading and natural-science-related information
- digital competences
- learning how to learn
- social and citizenship-related competences
- spirit of initiative and entrepreneurial competences, including the following:
  - creative thinking
  - risk assumption
  - capability to plan and realise projects (from the idea to the action)
  - critical way of thinking
  - problem-solving skills
- cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - individual	- explanation - discussion	- manual - workbook

- in group - in pairs	- presentation - text analysis - problem solving - experimental learning	- task-sheet - interactive board - laptop, computer and projector

WORKING PROCESS

	Teacher's activity	Student's activity
1. Introduction: **Motivation** **5 minutes**	**Motion therapy** We are beginning the today's class with motion. Stand up and repeat what I am doing.	Cooperating during the exercise.
4 minutes	**Walking exercises:** 1. Walking on heels. 2. Walking on external soles. 3. Walking in squatting, with vertical body. 4. Frog-jumping (knees in straddle, hands beside each other, hands and feet touch the ground alternately). 5. Rabbit jumping. 6. Spider walking (opposite hand-foot touching the ground together). 7. Crab walking (opposite hand-foot touching the ground together). 8. Indian jumping (opposite hand-foot).	Cooperating during the game.
Goal-setting **1 minute**	**Zoo** Everybody chooses a card. The cards show animals. Every animal features twice. The task is finding your pair. How are you looking for it? With the motions. Move as the animal in question. Today we are going to talk about the motion of animals and humans.	Listening.

2. Discussion: **Discussing the syllabus** **30 minutes** **Discussion in foursomes**	**Searching for knowledge** I am asking the children how they presented the animals' motion? What did they do? (with motions, by moving) Thus it means that we humans are moving too. **Video on the motion**. https://www.youtube.com/watch?v=u7bZtffveIY **Situation solving / discussion/ideas:** - What would happen to our bodies if we had to lie in bed for a week because of a virus? - Why do we have aching joints after an active PE class? - Why are we lacking air when running? - Why does the motion need healthy nutrition? **Mosaic learning** We are dividing the big groups into foursomes, we are dividing the tackled bibliography into 4 parts. Every member of the cooperating groups is going to process different text units. The experts of the topic are sharing the new information. The groups are matching their thoughts about the topic.	Cooperating in the conversation and discuss their thoughts Watching the film. Answering the questions. They are divided into groups and prepare cluster figures for the given topic. The topics are presented during the next class.

	Topics – Preparing the cluster figure: - Doing sport - Our joints - Breathing - Healthy nutrition	
3. Finishing: **Self-evaluation** **5 minutes**	***Solution of smart-box tasks:** http://www.okosdoboz.hu/feladatsor?id=885&select_osztaly_search=osszes-osztaly&select_tantargy_search=egeszsegneveles&select_temakor_search=sport http://www.okosdoboz.hu/feladatsor?id=916&select_osztaly_search=osszes-osztaly&select_tantargy_search=egeszsegneveles&select_temakor_search=sport **Relaxation/breathing exercise**	They are solving Internet-based tasks in connection with the topic. Participating in the relaxation.
Remarks:		
Homework:		
Attachments: Text for the mosaic learning		

SCHOOL: Zrínyi Miklós-Bolyai János Primary School		**Subject:** Hungarian Language and Literature
Classes:3-4	**LESSON PLAN** **Healthy life – Spiritual health**	**School year:** 2017/2018
Field of Science: - Natural Sciences - Social Sciences - Arts - Technology		**Lesson number:**

Main topic: Healthy lifestyle – spiritual health

The topic of the lesson: The functioning of our soul, stress management techniques

The goals of the lesson:

- Expanding knowledge in the topic of spiritual health
- Getting familiar with the concept of stress, ways of handling it, overcoming anxiety
- Building a community, shaping the skill of cooperation
- Independent learning with the help of cooperative technique
- Getting familiar with and applying exercises helping tuning up
- Developing self-evaluation
- Motivating by applying a ICT device

Lesson type: a lesson of processing new knowledge

Subject correlation: Art, Music

Developing key competences:

- **Communication in mother tongue**
- **Efficient and independent learning**
- Social and civic competence
- Initiative and venturesome competence
- **Aesthetic and artistic awareness and ability of expression**

Developing transversal competences:

- **Acquiring independent learning**
- Social competences
- **Cooperative activity**
- **Critical thinking and reflection**
- **Digital competence**

Teaching forms	Teaching methods	Teaching devices

- frontal - individual - group - pair	- explanation - discussion - demonstration - practical work - watching a film - associative cluster diagram - backpack-method - three go, one stays - word spinning in pairs - collage cube method	- foolscap - pencils (grey) - a short film (Internet) - associative cluster diagram - flashcards - magnets - board - colour pages - an empty paper cube - colour felt pens - pieces of white paper - glues - a projected text - music (Internet)

WORKING PROCESS

The process of the lesson

	Teacher's activities	Pupils' activities
1 Tuning up to the lesson: *backpack-method* **2 min.**	(S)he describes the essence of backpack-method (a simple introductory stress relieving method)	Everyone writes with a pencil on a foolscap what negative things have happened to them today. Then they fold the foolscap as small as they can and with every folding, the negative things are getting smaller and smaller. Finally, they put the foolscap in their pocket.

2 Motivating: Watching and discussing a short film **3min.**	(S)he presents a short film then controls the short discussion in connection with it highlighting the meaning of the colours in the film.	They listen then formulate cooperative opinions about what they have seen.
3 Introducing the concept of mental imbalance, explanation of its causes: Making an associative cluster diagram with the teacher's help **5min.**	(S)he controls the creation of the associative cluster diagram, writes the central term (mental imbalance) on the board.	They go out to the board and put their flashcards on it with the help of magnets around the central term while explaining the concept on their flashcard with their own words. (long-lasting mental problem, chronic illness, sleep disorder, loneliness, aimlessness, depression, alcoholism, anxiety)
4 Getting familiar with the concept of anxiety: Group work – in case of groups of 4: *three go, one stays* method (in case of groups of 3: two go, one stays) **12min.**	(S)he makes the pupils pull colour pages and the colours mean the colour of their group. Then (s)he hands out the text parts and the questions of the given groups.	The groups read their text part and underline the answers to their questions. Then one person stays at the table who will talk about the answers of his/her own group to the newcomers while the others go to different groups to tell the answers of their group to the pupils of other groups.
5 A solution to anxiety: A common interpretation of the projected text **5 min.**	(S)he controls the discussion of the projected text with the help of his/her questions.	They read the projected text silently then they discuss it.

6 Discussing individual stress management techniques in pairs then demonstrating the result: *wordspinning in pairs* about the expressions of „joy" and „liberation", demonstrating the result with the help of *collage cube* method. Listening to relaxing music during the work. **13 min.**	(S)he walks around, helps, controls. (S)he turns on the music which is on quietly up to the end of the lesson.	In pairs the pupils collect concepts about the terms "joy" and "liberation". With common consent they choose two of these concepts, write them using the colour of their group on a piece of white paper and glue this paper on any side of an empty paper cube.
7 Summing up at the end of the lesson: Common discussion about: - the concept of mental imbalance - the concept of anxiety - the methods of solution **3 min.**	(S)he controls the discussion, gives the paper cube around. (S)he presents the music to the pupils what they have been listening to.	They discuss the concepts of the lesson and study the cube formulating cooperative opinions about it.
8 The evaluation of the lesson: - How did you feel in the lesson? - Are you satisfied with your work in the lesson? - Would you change anything? **2 min.**	(S)he controls the common evaluation of the lesson with his/her questions.	They can take remarks freely to the evaluating questions asked by the teacher.

Notes: In group work if there are less than 6 groups, the text parts can be contracted – according to the numbers of the groups. The texts and the film are in Hungarian but the teacher can choose freely other texts and film about anxiety and its solutions in another language.
Homework for the pupils:
Attachments: • Text parts (see *Sources*) • A short film: Számít, hogy vagy! https://www.youtube.com/watch?v=yylfkkT6trw • Background music to relax: https://www.youtube.com/watch?v=s7Rw_SFsUrw

SCHOOL: Scoala Gimnaziala "Szentivani Mihaly"		**Subject:** English lesson
Class: 3.-5.	**SCHEDULE** **Eat healthy!**	**Year:** 2017/2018
Areas: - communication and language - natural sciences - social sciences - arts		**Number of classes:**

Topic: Healthy lifestyles

Topic of the class: FOOD/ HEALTY EATING

Objectives of the class:

- examining the difference about foods,
- learning that why is important to eat vegetables and fruits

Type of class: revising and developing the acquired knowledge and skills

Subject's correlation: Hungarian language,

Development of key competences:

- communicating in one's mother tongue
- communicating in a foreign language (vocabulary: food, nutrition, healthyeating)

- digital competences
- learning how to learn
- social and citizenship-related competences
- spirit of initiative and entrepreneurial competences, including the following:
  - creative thinking
  - capability to plan and realise projects (from the idea to the action)
  - critical way of thinking
  - problem-solving skills
- cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools

- frontal - individual - in group - in pairs	- explanation - discussion - presentation - text analysis - problem solving - experimental learning	- Flashcards (food) - Activity sheet, - fruits and skewers, - 4 trays, - laptop, computer and projector

Video: Healthy Eating: An introduction for children aged 5-11

https://www.youtube.com/watch?v=mMHVEFWNLMc

https://www.youtube.com/watch?time_continue=5&v=tFWhBL55FFA

Show younger children why eating their fruit and veg is good for them

https://www.youtube.com/watch?v=kteZneJm1EI

Activity sheet, fruits and skewers, 4 trays, laptop and video projector

Type of lesson: revising and developing the acquired knowledge and skills

Introduction: This lesson consists of a series of activities to help students review food vocabulary and learn about the importance of healthy eating.

Procedure:

Activity1: -warmup

Aim: get the attention, involve students quickly to introduce the subject of the lesson

Memory game (students sit in circle)

One person starts the game by saying, "I'm going for a picnic and I'm going to bring with me " Fill in the blank with different foods. The next person then repeats the first line and adds another item.

Play continues around the group with each person repeating the items mentioned and adding their own at the end. Each player must begin with the phrase "I'm going for a picnic.." and must list all items in the correct order.

It's also fun to change the opening line. Instead for picnic you can go to the market, grandma's house, or wherever you choose.

Interaction: T- SS., SS-T

Timing: 5 min

Aim: to be able to speak about their favourite food, likes and dislikes, eating habits

Activity 2:

Find someone who...

Students use a checklist as they walk around the room trying to find a person who has a certain characteristic. When students find "someone who LIKES BROCCOLI" that person is asked to sign up the checklist of paper. The goal is to meet and talk to as many students as possible and find at least one person for each characteristic.

Important: a person's name can appear only once. Thus, if Maria likes broccoli and she can cook, too, Maria's signature appear on the checklist only once.

Timing: 10 min.

CONCLUSIONS: We do all have different eating habits, different tastes. But have you ever aked why we eat?

Activity 3 :

Aim: to enlarge vocabulary: nutrients, balanced diet, minerals

SS. watch and listen to a video on healthy eating paying attention to the prepared material: Healthy Eating: An introduction for children aged 5-11

https://www.youtube.com/watch?v=mMHVEFWNLMc (2.5 min)

SS resolve the crossword **(see annex no 2)**

They have to put in the right order the bold letters to get a new word: ***nutrients***

Timing:10 min

Then SS watch a new video: Show younger children why eating their fruit and veg is good for them https://www.youtube.com/watch?v=kteZneJm1EI (3.15min)

TRUE/ FALSE exercise:

1. Fruits and vegetables contain some very important nutrients that our bodyneeds.
2. We need a great amount of vitamins andminerals.
3. We should eat a wild variety of differentfoods.
4. Vitamin A helps to keep our visionhealthy.
5. Vitamins protect us and make usstrong.
6. Fiber doesn't help our digestivesystem.
7. We should eat at least 8 portions of fruits and vegetables aday.
8. A great tip: try to eat as many differen colours aspossible.

(Answer key: 1 T, 2 F, 3 T, 4 T, 5 T, 6 F, 7 F, 8T)

Timing: 10 min

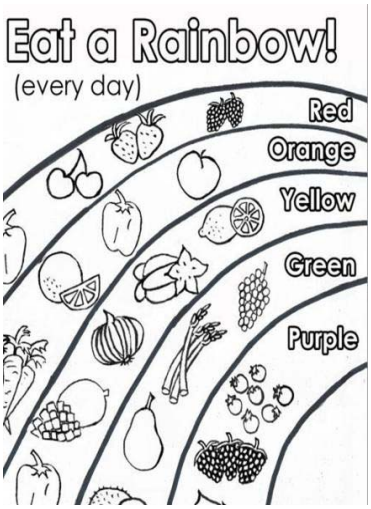
Activity 4:

EAT A RAINBOW ACTIVITY

Aim: to learn about a wide variety of fruits developing healthy eating habits Students are divided into 3 groups. They sit at three different tables. They change places when they finished the activity.

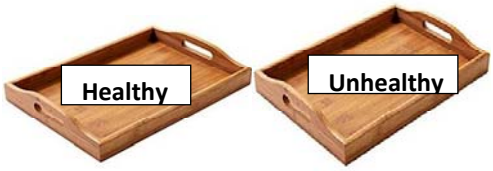
Table 6: Tasks for the groups

the art group	MUSIC GROUP	MasterChef JUNIOR

With this coloring page students are encouraged to eat a wide variety of fruits and vegetables in an array of colors  	SS learn one of these songs (laptop and headphones) https://www.youtube.com/watch?v=iK2k3e4thSQ I can eat a rainbow https://www.youtube.com/watch?v=kdJurCWLn2U Eat a Rainbow Song Preschool Fun Learning Music https://www.youtube.com/watch?v=CkP-sewWCeE Eat a Rainbow rap https://www.youtube.com/watch?v=0YxD2tsvCWQ Hokey Pokey (Fruit and Veggie) - Kids Dance Songs - Children's Songs by The Learning Station	Rainbow fruit skewer: these vitamin- packed fruit skewers are a simple, colourful and fun way to get kids to eat fruit. Take 1 wooden skewer and thread the following fruit onto each – 1 raspberry, 1 hulled strawberry, 1 tangerine segment, 1 cube of peeled mango, 1 chunk of peeled pineapple, 1 chunk of peeled kiwi, 1 green and 1 red grape, and finish off with 2 blueberries. 

Interaction: GW,SS-T **Timing: 30 min**

Activity 5



A Race for Health

SS are divided into two teams. Each team has to line up in front of the blackboard with food flashcards placed on it. On the other side of the room each team has two trays: one for healthy food and one for junk food. Teacher describe one of the foods and the student who recognizes it first, gets the card, runs with it and will drop it in the correct tray. Student return to the back of the line and the team member who's next in line, does the same. The team who placed the most food in the correct trays wins.

(see annex 3)

Interaction: T-SS, SS-T

Timing: 10 min

Activity 6: assigning the homework

Fun with cooking: Be a professional chef! Invent a new recipe using the ingredients from the healthy tray. You can illustrate too.

Interaction: T-SS

Timing: 5 min.

13 Biodiversity

SCHOOL: Lendvai - 1st bilingual primary school		**Subject:** Fine arts
Class: 3.-5.	**SCHEDULE** **Bee panels**	**Year:** 2017/2018
Areas: - natural sciences - social sciences - arts - technique		**Number of classes:**

Topic: Biodiversity - Bees

Material of the class: Bee panels

Objective of the class:

- getting to know the bees and their habitat,
- development of visual and aesthetic capacities,
- development of creative thinking and capacity to create,
- proper utilisation of artistic items and tools,
- independence during creation,
- listening concentration, development of accuracy of perception,
- development of skills and capacities,
- participation in the conversation and work of the learning group,
- self-knowledge, development of self-reflexion capacity.

Type of class: acquiring new information

Correlation with the subject: natural sciences, Hungarian and Slovenian languages

Development of key competences:

- communicating in one's mother tongue
- communicating in a foreign language
- mathematical, writing-reading and natural-science-related information
- digital competences
- learning how to learn
- social and citizenship-related competences
- spirit of initiative and entrepreneurial competences, including the following:
  - creative thinking
  - risk assumption
  - capability to plan and realise projects (from the idea to the action)
  - critical way of thinking
  - problem-solving skills
- cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - individual - in group	- explanation - discussion - presentation - formative perception - work in practice - opinion discs	- computer, projector and screen, - glue, - pencil, tempera, acryl paint, - veneer sheets or wooden sheet, - alcoholic felt-tip pen, - small or big stones - 2-3 brushes of various size - opinion discs, envelopes

WORKING PROCESS

	Teacher's activity	**Student's activity**
1. Introduction **Motivation** **4 minutes** **Setting the objectives** **1 minute**	**Getting tuned** The teacher is showing a picture of a beehive. He asks the students whether they recognize the picture and  whether they have encountered such beehive. Why is the beehive colourful? In order to help the bees in their orienteering every beehive is of different colour or above the entrance there is another mark. With the colours and shapes the bees can differentiate their "flats". It is similar to the number of the house. Today you are going to build a colourful beehive.	They are studying the beehive in the picture. They are cooperating in the discussion. They are sharing their experience and opinions They are listening.
2. Discussion **Task/creation** **35 minutes** **Requirements**	**Creation of bee-panels –painted wooden sheets** (the beekeepers are placing it onto the beehive) Every student gets a wooden sheet. This will be the drawing sheet. It is required to put colourful motifs onto the wooden sheet which is connected to nature. What might have they	The students are listening to the teacher's instructions then they are answering the questions. They are listing some possible motifs.

	painted? During work the following requirements need to be considered: - originality - considering the motif - from the whole to the parts - using the painting tools - colourful piece 	First they are drawing in pencil then paint with tempera. In the end they are using alcoholic felt-tip pen for the figures.
3. Finishing **5 minutes**	**Opinion discs** We are preparing small discs that contain key sentences. We are defining the wording of the discs together, e.g.: I am against this thought, I am accepting it but I have a comment, I agree partly only, I may add something, I think similarly, etc.What was the motif of today? Did everybody consider the motif? Where did you have difficulties?	The students are exposing their pieces then with the opinion discs they are analysing each-other's work.
Remarks:		
Homework:		
Attachments:		

SCHOOL: Zrínyi Miklós-Bolyai János Primary School		**Subject:** Technology
Class: 4	**LESSON PLAN** **The protection of the forest, recycling leaves**	**School year:** 2017/2018
Field of Science: - Natural Sciences - Social Sciences - Arts - Technology		**Lesson number:**

Main topic: Biodiversity

The topic of the lesson: The protection of the forest, recycling leaves

The goals of the lesson:

- Deepening conscious environmental protection through an experiential way
- Motivating with a drama game using ICT device
- Getting familiar with the term of composting
- Connecting the concepts of forest and recycling
- Making a piece of work by a tutorial video

Lesson type:

- a lesson of processing new knowledge

- a systematizing lesson

- a practical lesson

Subject correlation: Science, Art, P.E., mother tongue, Ethics

Developing key competences:

- **Communication in mother tongue**
- **Natural Scientific competence**
- **Efficient and independent learning**
- Social and civic competence
- **Initiative and venturesome competence**
- **Aesthetic and artistic awareness and ability of expression**

Developing transversal competences:

- **Acquiring independent learning**
- Social competences
- **Cooperative activity**
- **Critical thinking and reflection**

• **Digital competence**		
Teaching forms	**Teaching methods**	**Teaching devices**
- frontal - individual - group - pair (according to choice)	- explanation - discussion - demonstration - drama game - idea map - visiting a gallery - practical work	- big wrapping paper (one per each group) - felt pens (2 or 3 per each group) - texts (about the concepts of „protected species" or „composting"): one per each group - paper and a pencil (to take notes) - magnets <u>For making the owl</u>: - scissors - cello tapes - paper glue or other glue - colour (blue/green and red) and white paper - small transparent plastic bags - smaller, oval leaves - black felt pens

WORKING PROCESS

The process of the lesson

	Teacher's activities	**Pupils' activities**
1 Organizing work: Checking the devices **3 min.**	(S)he makes the pupils check the necessary devices.	They check the devices which are on their tables.

2 Motivating, tuning up: Acting out the stages of the storm in the forest with the help of a short *drama game*. **2 min.**	(S)he describes the task and tells what is happening.	They carry out the task (imitate what the trees do with movements, making noise as the storm is getting more and more intense).
3 Designation of the purpose of the lesson **1 min.**	(S)he describes the goals of the lesson (the importance of the protection of the forests, recycling the fallen leaves).	They listen.
4 Systematizing the existing knowledge, introducing new terms: Making an *idea map* in groups of 3 or 4 on big wrapping paper about the importance of the forest (central idea: „Forest is important because…") + a member of each group gets a text part about the concepts of "composting" and "protected species") **10 min.**	(S)he describes the tasks, helps organize the groups of 3 or 4 and dividing the tasks within the groups.	They make groups of 3 or 4, divide the tasks within their groups and carry them out.
5 Discussing the existing and the new knowledge and connecting them: **5 min.**	The teacher fixes the sheets of wrapping paper on the board with magnets, controls the verbal comparison. (S)he helps connect the new terms to the forest and the purpose of the lesson.	They compare the idea maps. The responsible group members – completing each other – describe the two new terms aloud.

6 Verbal puzzle: Riddle about the owl. Owl is a protected species. **1 min.**	Describing the verbal riddle: „Lehet füles, lehet macska, Hogyha repül, nincsen hangja. Jelképe a bölcsességnek, Nagyfejű – mondja a verébnek.” Connecting the new concept (“protected species”) to the owl.	They listen and find out the solution.
7 Practical activity: Watching a *tutorial video* noting down the work phases, making the piece of work **15 min.**	(S)he describes the task (calling the attention to the compostability of the used leaves), presents the tutorial video, walks around controlling the process of making the piece of work. She starts music during the process of making the piece of work.	They watch the video, take notes about the work phases then make the piece of work. The making of the piece of work can happen individually, in pairs or in groups.
8 Examining and evaluating the pieces of work: With the method of *visitng a gallery*. **6 min.**	(S)he makes the pupils put their pieces of work on a separate table. (S)he stops the music. (S)he controls the evaluating discussion.	They examine one another’s piece of work then - in a form of a common discussion – they evaluate what they have seen.
9 Evaluating the lesson: - Did you like the lesson? - Did you learn new things? - Can this new knowledge be useful? **2 perc**	(S)he controls the evaluation of the lesson with his/her questions.	They can freely express their opinion and remarks about the lesson.
Notes: The teacher can choose any other riddle about owl in his/her mother tongue. (S)he can also freely		

choose other texts about the two concepts in another language.
Homework for the pupils: Possible homework: if a pair/group or an individual works slower, they can complete their piece of work according to the noted work phases in the afternoon at school (in case of pairs/groups) or at home (in case of an individual). The pieces of work can be evaluated in an almost-ready condition as well.
Attachments: text parts about the following concepts: • protected species • composting

SCHOOL: Scoala Gimnaziala "Szentivani Mihaly"

Topic/theme: The bear	
Curricular areas: Language and communication, Mathematics and Natural Sciences, Man and Society, Arts, Technologies, Physical Education, Sport and Health Subjects: Hungarian, Science, Play and move/ Music and move, Arts	
The structure of the project:	
	Aims: **Through complex action and by playful activities to develop environmental awareness, knowing the importance of the nature and animal protection behaviour.**
Objectives	To help students to acquire as much knowledge as possible about the lifestyles and habitats of the bears, and their endangeredness. To give the opportunity to a comprehensive application of the educational content that appears in the activities
Expected outcomes	Positive changes in the students' behaviour and attitude towards environment and animals.
Age group	9-11 years old
Time/**Period**: 1 day	
Resources: Techniques, methods: lecturing, collaborative discussion, explanation,demonstrating,observing, research, constructivist teaching methods, evaluation- feedback. Interactions **:** CL (entire class),IW (individual work), PW (pair work), GW (grop work)	
Evaluation: oral, self,awards	

Lesson plan

Curricular area: Language and communication

Subject: Hungarian Language and Communication – integrated learning activity Related subjects: Maths (code-writing and torpedo game), Natural Science

Topic: Mészöly Miklós – The Sad Bear

Aims: discovering the interaction between man and his environment, combining literary texts with everyday, realistic situations, emotions, motivations, developing nature- friendly behaviour

Competencies:

- ✓ Global comprehension of non-literary and literary texts in everyday speech situations
- ✓ Recalling expressions, phrases (proverbs, speeches, hostesses)
- ✓ Clear and expressive communication

Objectives:

- ➢ Developing imagination gaining literary experience by developing speech perception, speech comprehension, and speech production through native language games
- ➢ Developing the necessary subcompetences for language and communication competence: eg. attention, problem-solving thinking, memory, speech comprehension, vocabulary development, reading, spelling
- ➢ Developing creativity
- ➢ Developing social relationships (co-operation) during group work.
- ➢ Deepening their sense of responsibility, the protection of animals and respect for nature
- ➢ Developing moral judgments by learning the moral lessons of the tale

Type of the lesson: mixed/ combined

Teaching techniques and methods: discussion, explanation, instructions, presentation, illustration, observation, constructivist teaching methods, evaluation

Interactions: GW, PW, CL

Materials: cards, pictures, colored pencils / pencils, torpedo table, prediction table, exit card, reward bookmark

Evaluation– recognition and prasing (awards)

STAGES/ **Timing**	**Activity** **The sad bear- Mészöly Miklós** **(Educational content and procedure)**	**Techniques/Interactions**
Introduction Warm-up (3 min) **Raising attention**	Students take their places I brought you a secret message. It's a code writing. Dear children! Today we are going to learn about...21 9 6 39 10 30 27 19... More precisely ....3 2 22 1 33 24 31... .... 21 9 6 39 10 30 27 19... The first five students who solve these and find the two words will be officially named cave guard. (The digits stand for different letters: they indicate the letter's place in the alphabet) Decoding: about the bear, about the sad bear	CL/IW Code writing **Problematization** **What do you predict..?**

(5 min)	What do you think, what can be the reason that a bear should be sad? (discussing various reasons) I found a little poem, which author, Csukás István, reveals to you why may a bear be said.	

Breathing exercises (5 min)	Csukás István: Bear Tale The bear is humming: growling, my pussy is dull, That's why I grow. He was trudging to a tailor But the tailor works for money. The bear has no money He spent it to honey. Poor bear, what will happen to you If the big cold comes? Let's read together the first verse (stanza) softly, then loudly, slowly, then quickly and vowelically	
The announcement	What do you think, in real life, people can be responsible for the bears 'sadness'? Please, stand up if you can tell 3/2/1 reason. Unfortunately, humans occupies their living space when they cut forests, pick forest fruits, build houses everywhere, or chase them from their place of residence with the loud noise of the chainsaws. Mészöly Miklós has just written a tale for you. Its protagonist felt that his cave was tight. Today we will learn about this tale and what we can do to avoid to make bears feeling sad in	

of the objectives and topic **Topicprocessing-while reading** **(10 min)**	reality. See if his mood/ approach has changed, and if so, why. Mészöly Miklós: The sad bear (annex no.1)	**Model reading** **Interrupted reading**
Fixing the knowledge **(20 min)**	When the teacher comes to the part that the bear breaks the goat's horn, he stops and gives the students a prediction table: What do you think is going to happen? What are the evidence for it? What really happened … What was the bear really like? Clap if you hear a proper attribution. stupid, sad, rough, sorry, cheeky, sensitive, pessimistic, good hearted… How has he changed his mood? What can we do to prevent bears from entering our homes, and not to feel their home tight? Could you formulate a simple call for this? For	**Giving opinions reasoning** **Group forming**

Evaluation	example: All the bears, big and small Ask you: do not disturb their home! The bear is a very popular figure of the tales, cartoons and movies. I have brought you some of the famous teddy bear figures in puzzle pieces and your job is to find the missing parts. (Annex no2) This is how the groups are formed.(Baloo, Winnie the Pooh, stb). Depending on how many groups we want to form, the same number of pieces we cut the images And now, let us cheer up our sad bear. Let us start to explore some cave's miracles! As you know, 7 is a magic number in the world of tales. Today, as in the tales, you have to find 7 miracles, that is, we have hidden the questions of seven different types of tasks on the board. Each cave is guarded by a guard. There are more teams than guards / caves. (for example: 5 guards/ 6 groups) So the teams should always watch out which guards are actually free and immediately run there. You're trying to shoot: for ex. 2-C . If you find a question there, try to answer it … if the guard finds it right, you get a pip ….if your answer is wrong, you get an X. You can go back to the same question in a next round and try again to find the right solution.If no hit, you pull a line. The goal: to solve 7 of the 30 given tasks correctly, but at least 1 correct solution for	**The games rules**

	each type of task. Are you ready? Each team is given a torpedo table (anex no. 3) Each guard is given a sheet with the tasks and the solutions/answers (anex no. 4) After the first team has the 7 right answers, the game is over. We discuss the right answers and we announce the winner team. For award: bookmarks (anex no. 5) **Exit card** What I've learned today What surprised me today What I've realized today Today I..... Or playing cube: there are unfinished sentences on the cube's sides: I liked this class, because... Today my team..... I would have been happier, if …	
Summarizing, reflection **(5 min)** **Follow-up**	**Homework:** To finish the prediction teble (what really happened) A message from the bear with code writing (it can be a rhyming short poem).	

14 Environmental education from a global aspect

SCHOOL: Lendvai - 1st bilingual primary school		**Subject:** Mathematics
Class: 3.-5.	**SCHEDULE**	**Year:** 2017/2018
Areas: - **natural sciences** - social sciences - arts - technique	**Litre and decilitre**	**Number of classes:**

Topic: Environmental education from a global aspect – World Water day

Material of the class: Litre and decilitre

Objectives of the class:

- measurement of quantities, oral and written expressions,
- monitoring the relationships between quantities (litre, decilitre),
- helping the children in observing more consciously to the utilisation of electricity and water,
- forming and improving the children's environment-related attitude,
- learning about the possibilities of water utilisation, forming the thrifty consumption habits,
- forming the positive approach to the protection of water as well as feeling responsible.

Type of the class: introductory class

Subject's correlation: Slovenian language, Hungarian language, knowing about the environment

Development of key competences:

- communicating in one's mother tongue
- communicating in a foreign language
- mathematical, writing-reading and natural-science-related information
- digital competences
- learning how to learn
- social and citizenship-related competences
- spirit of initiative and entrepreneurial competences, including the following:
  - creative thinking
  - risk assumption
  - capability to plan and realise projects (from the idea to the action)
  - critical way of thinking
  - problem-solving skills
- cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - in groups	- explanation - discussion - text analysis - experimenting - graphical presentations - problem solving - experimental learning - cooperative learning	- plastic bottles, box for curds, plastic cups, small and big glasses, tasks, bucket, sticker, felt-tip pen, cups, glasses of 1 dl and 2 dl, plastic bottle of 1 l

WORKING PROCESS

	Teacher's activity	Student's activity
Group forming **Introduction/Motivation** **4 minutes**	**Getting tuned** Water-related riddles. It has no magic stick, But makes the landscape disappear. When it sets you don't know where your nose is. What is it? ***(fog)*** Running without legs, swallowing everything without a throat, has a bed but it is not sleeping. What is it? ***(river)*** Falling from the sky, but has no wings, It is all flakes but not a pillow, And when it covers with a white blanket you can make a man. What is it? ***(snow)***	The students are listening to the riddles and try to find out the solutions. The students are forming groups: 1. group: fog / mist 2. group: river 3. group: snow

	The students are divided into 3 heterogeneous groups.	
Discussion **1. Objectives:** **1 minute** **2. Experiment** **10 minutes** **3. Group work** **25 minutes**	Today we are going to learn about volume. **Adventurous path of water** We are selecting 3 students to perform the experiment. „Place a box into the washbasin. Wash your hands as you usually do. let all the water used for washing remain in the box. Pour the used water into the measuring vessel then measure and record the quantity. Repeat the operation until the water in the box runs out. Add up the recorded quantities. Watch the water in the box. What is it like? Is it potable? What can one do with it? Open the tap. What is the water flowing from there like? Is it potable?" The quantity of the used water will be probably high. We are drawing the attention of the students that we have to care for the potable water since it is rather scarce on the planet. **Task solving in groups**	The students are carrying out the experiment. Others are watching and answering the questions. We are solving the task (attachment).

	In the class-room we are preparing there stations. Every group will work on a station.	
Finish **1. Evaluation:** **5 minutes**	At the end of the work there is evaluation. What were the difficulties? What was likable with the stations?	Every group presents its own station and the results obtained there.

Remarks:
Homework: /
Attachments: Description of the stations, tasks

SCHOOL: Zrínyi Miklós-Bolyai János Primary School		**Subject:** Ethics
Class: 5	**LESSON PLAN**	**School year:** 2017/2018
Field of Science: - Natural Sciences - Social Sciences - Arts - Technology	**Art and recycling**	**Lesson number:**

Main topic: Environmental education from a global aspect

The topic of the lesson: Art and recycling

The goals of the lesson:

- The lasting and the momentary art
- Getting to know the purpose of art
- The importance of the presence of aesthetics in people's lives
- Recognizing the joy of creation
- The differences and similarities of a creator and an artist
- Shaping and developing the artistic view

Lesson type:

- a lesson of processing new knowledge
- a practical lesson

Subject correlation: Art, History, Hungarian Language and Literature, Geography

Developing key competences:

- **Communication in mother tongue**
- Efficient and independent learning
- Social and civic competence
- **Initiative and venturesome competence**
- **Aesthetic and artistic awareness and ability of expression**

Developing transversal competences:

- Acquiring independent learning
- **Social competences**
- **Cooperative activity**
- **Critical thinking and reflection**
- **Digital competence**

Teaching forms	Teaching methods	Teaching devices
- frontal - group	- explanation - discussion - demonstration - group discussion - practical work - twenty questions	- 2 ppts and the devices necessary to present them - some everyday garbage - wrapping paper (one per each group) - felt pens (3 or 4 per each group) - board - magnets for the collage: - cardboard sheets (one per each group) - newspapers - scissors - paper glue - paint - painting devices

WORKING PROCESS

The process of the lesson

	Teacher's activities	Pupils' activities
1 Tuning up, preparation: Watching a ppt together: - What differences can you see between the works of art on the slides? - What makes an artist? - Can you become an artist? **5 min.**	Presenting a ppt (ppt 1), controlling the discussion with questions	Discussing the slides, cooperative opinions

2 Presenting a topic Collecting lasting and momentary works of art in groups of 3 or 4, with the method of *group discussion*, They write their ideas on wrapping paper in two columns (in 3 minutes), then they have a discussion under the teacher's control: - Can it be a work of art that exists only momentarily or for a short time? - What is a work of art and what is not? **7 min.**	(S)he helps form groups of 3 or 4. (S)he explains the essence of the task, hands out the wrapping paper and the felt pens. (S)he puts the ideas of the groups on the board with magnets and discusses the results with the pupils with the help of controlling questions.	They form groups of 3 or 4, discuss and write down their ideas. They analyze their own and the others' ideas.
3 Recycling and art: - What do you think of these works of art, why can they be artistic? - What does recycling mean to you? - What would you use the chosen things for? - Can they be works of art? **5 min.**	Presenting a ppt (ppt 2), controlling the discussion with questions. Talking about the garbage the teacher has brought.	Discussing the slides, cooperative opinions. Discussing the garbage the teacher has brought from the point of view of the possibilities of artistic use

4 Practical work: The concept of collage Making a collage **15 min.**	(S)he discusses the concept of collage with the pupils. **Collage:** a *work of art which is fit together from the pieces of paper, photos, cloth, wood, metal or other materials.* (S)he help check the groups' equipment. (S)he explains the essence of the task. (S)he walks around, helps and controls.	The groups check the necessary equipment. They make the collage according to the teacher's instructions.
5 Evaluation of the works of art: with the help of the *twenty questions* method **7 min.**	(S)he describes the method of the evaluation (twenty questions). (S)he puts the collages on a separate table and numbers them. If necessary, (s)he controls the pupils' evaluation.	They choose one pupil from each group who sorts out one of the collages and with the help of the twenty questions method makes the others find out which work of art (s)he is thinking about. (The others' questions can refer to the physical appearance of the work of art but impressions or emotions it can evoke as well.)
6 Evaluation of the lesson: - Did you feel good in the lesson? - Did you like the works of art on the slides? - Are you satisfied with the creation that you have made together with the others? **4 min.**	(S)he controls the evaluation of the lesson with the help of questions.	They evaluate the lesson with a common discussion.

7 Organizing work at the end of the lesson, tidying up **2 min.**	(S)he controls the tidying up.	They tidy up in the classroom.

Notes: The equipment needed for making a collage – in order to save time – can be prepared before the lesson and – when the pupils are divided into groups and they start working with the group discussion method – can be handed out to the groups.
Homework for the pupils: Possible homework: look for works of art created by the nature in your environment and take photos of them.
Attachments: • 2 ppts

School: Scoala Gimnaziala „Szentivani Mihaly”

Lesson plan

The birds and Trees

SCHOOL: Scoala Gimnaziala „Szentivani Mihaly”		**Subject:** interdisciplinary activity: Hungarian Language, Mathematics, Science, Play and move/ Music and move
Class: 3.-5.		**Year:** 2017/2018
Areas: - Language and Communication, - Mathematics and Natural Sciences, - Arts, - Technologies,	**SCHEDULE** **The birds and trees**	**Number of classes:**

Topic: Environmental education from a global point of view

Theme: International Day of the Birds and Trees

Objective of the class:

- recognizing the impact of humanity on the environment
- development of the environmental education,
- educating environmentally conscious thinking and lifestyle,
- exploring the interaction between man and environment
- independence during creation,
- listening concentration, development of accuracy of perception,
- development of skills and capacities,
- participation in the conversation and work of the learning group,
- self-knowledge, development of self-reflexion capacity.

Type of class: acquiring new information

Correlation with the subject: natural sciences, Hungarian and Slovenian languages

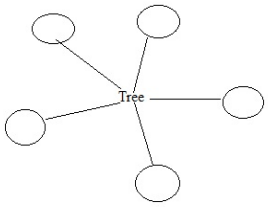
Development of key competences:

- communicating in one's mother tongue
- mathematical, writing-reading and natural-science-related information
- digital competences
- learning how to learn
- social and citizenship-related competences
- spirit of initiative and entrepreneurial competences, including the following:
  - creative thinking
  - capability to plan and realise projects (from the idea to the action)
  - critical way of thinking
  - problem-solving skills
- cultural awareness and capacity to get expressed

Teaching forms	Teaching methods	Tools
- frontal - individual - in group	- explanation - instruction - discussion - presentation - debate, gallery visit - simulation-role-playing - formative perception - didactic games	- computer, projector and screen, - literary texts ,folk songs collections,tree bark textures - pictures / flashcards, the book: „Az Élet Fája" (Tree of Life), - paper bird craft - color paper, pencils - fake money, seeds, paper acorns

Classroom Arrangement: The classroom is arranged so that the students have space to move. The tables are placed on both sides with the auxiliary materials that the team needs. On the right side there will be five tables for the Birds team: on the first table journals, books, on the second and third tables natural science encyclopedia, Wonderful Animal World or the Tree of Knowledge series, birds flashcards, on the fourth table speeches, proverbs, books containing literary texts, collections of works of fine art on the fifth table, folk song collection. On the left, at the tables of the Foresters' team, there will also placed the teaching aids. Also, the students can use a computer for searching more information.

Sequences/ stages	CONTENT (Educational content and procedure)	Techniques/ Interactions	Timing
Organization **Introduction**	Students take their places.		**Total: 45**

Warm up	Riddle: It receives a letter in spring, but answers only in autumn, sending back not one, not even two, but many hundreds. (tree)	**CL**	**minutes** **5 min**
		PPT	
	Do you know what day is today? Do you know what is the significance of today?	**presentation**	
The announcement of the objectives and topic	Today we celebrate The International Day of the Birds and Trees. (I will show a ppt presentation about the significance of this day, some interest data about this theme / see annex 1)	**Brainstorming**	**10 min**
	Today, we are going to do various activities and play in order to increase our knowledge on this topic and to get ideas on how to protect our immediateenvironment!		
	Brainstorming:  	**Conversation**	
Relaxing	Here you can see The Tree of the Life! (teaching material: leafy tree painted on a cardboard) What do you think why it has this name? Who could be the inhabitants of the tree? Why do we need trees? What kind of objects / things can be made from wood? What kind of trees		

	do you recognize? Etc Since you answered the questions correctly, the tree's crown opens with the following inscription: Welcome! Nature, including plants and animals, welcomes guests and people. Would you like to go for a trip? Then come on! Sing a song: Somvirág, somvirág, aranysárga a világ, Kakukkfű, kakukkszó, kirándulni volna jó, Fűzfasípot faragni, fűzfalóval szaladni, Árkon-bokron által, háton hátizsákkal, Menni-mendegélni, este hazatérni. We will take an imaginary walk in the woods. The interesting part is that we would be the living trees of the story. (See Annex 2) (students are listening to the story with closed eyes) Reflection on the tale : How did you feel .....? (when the spring arrived, when the sun was shining, when you bloomed, when you were touched by the children, when they admired you, when the bikers arrived, when you could not speak, when you did not know how to stop them, when the storm came, after the storm, etc. How do you feel now? Let's call a bird	**Problematization** **Conversation**	**10 min** **5 min** **5 min**

	to visit us! Song: Tilili- tülülü, csiri-cserere, Lombpalotába gyere be! Tilili-tülülü, csere-csiriri, Hogyha bejöttél, ne menj soha ki! The little bird arrived! (paper bird craft) Conversation about the birds: What kind of birds do you know? What do birds eat? Where do they live? Why are they useful? Which is your favorite bird? Etc.	**CL** **GW**	**5 min** **5 min** **10 min** **Total:** **90 min**
Brake Raising attention	Let us make the Tree of Life a really home for our bird!		**5 min**
Team work	We form teams: cardboard circles are pulled by each child from a basket, and according to their color two teams are formed: the green circles are the Foresters, the yellow circles are the Birds.		
Acquisition of knowledge, data collection	There is a symbol on each of the circles of the given colour, so there will be more micro teams within the Foresters and Birds group: Architects, Queries, Cookies, Linguists, Artists. (Annex 3)	**Picture-gallery**	
Presenting the data collection	Each team writes the results of its work on egg or leaf-shaped paper, which is placed on the tree or in the bird's nest.		**5 min**
Brake	Teams take their seats around the right table. Each team gets their job and works accordingly. (Annex 4)		**20 min**

	Each team will present the results of their work.. Songs: we sing folk songs about birds. I see a letter in the beak of our bird. It has brought some tasks for you! Task 1: Add the 'mirror image' of the number to the middle of each acorn (for example: 3215+ 5123): 3215, 2013.8101. I put the acorns on the board with a magnet 2. There are non-migratory birds flashcards placed on board (black roaches, pigeons, woodcocks, roses, horns, red bears. There is one operation on each bird's feet. Every bird has a letter in its mouth. They have to resolve the operations correctly, sort them in ascending order and get the name of a non-migratory bird (jay). 2538+4159= 6697. 7416+94=7510 634+9086= 9720 2317-409= 1908 5413-1247=4166 6725-1907=4818 I show the next task which is a math-word-problem (with the video projector), two students read it and a student at the board solves: data, question, solution, answer.		**60 min** **20 min** **Total: 40 min** **5 min** **10 min** **10 min** **15 min**
Mathematic tasks Solving simple addition and			

subtraction **Didactic game**	The pupils of our school collected different fruits for the birds: 2322 acorns, 119 nuts and some hazelnuts: as much as walnuts and acorns altogether. How many harvests have been collected altogether? Since you did such a great job, the award will be a game (we will play) Each student pulls a note from my magic box with simple operations. There will be four solutions: 10,20,30,40. Thus we form four groups. Each group gets fake money for games and wrapped seeds at different prices. I select each seller per group, the rest are customers. They have to buy seeds for the birds. Everyone has to count: the seller and the customers, too. The operations are written in their notebook. We discuss in the groups: how much money left after ones bought the pumpkin seeds? etc.		

Used literature

2. Environmental education from multidisciplinary approach

UNESCO: What is ESD; Available online:
http://en.unesco.org/themes/education-sustainable-development/what-is-esd
Accessed February 2018

KMK-BMZ Project group: Curriculum Framework for education for sustainable development. 2nd updated and extended edition, 2016, Jörg-Robert Schreiber and Hannes Siege (eds, Result of the joint project of the Standing Conference of the German Ministers of Education and Culture (KMK) and the German Federal Ministry of Economic Cooperation and Development (BMZ), Cornelsen.

UNESCO - Education for Sustainable Development (ED/PEQ/ESD), Division for the Promotion of Quality Education: UN Decade of Education for Sustainable Development 2005 – 2014, ED/2005/PEQ/ESD/3, 2005, Available online: http://unesdoc.unesco.org/images/0014/001416/141629e.pdf,
Accessed February 2018

Robottom I.: Environmental Education in changing times, in B Moon, S. Brown, & M. Ben-Peretz (Eds.), Routledge international companion to education, 2000, London: Routledge, pp. 502-512).

Lukman R, Lozano R, Vamberger T, Krajnc M: Addressing the attitudinal gap towards improving the environment:a case study from a primary school in Slovenia, Journal of Cleaner Production, 2013, 48: 93–100.

Marentič Požarnik B, Milekšič V, Plut D, Šorgo A, Pavšer N, Pukl V: Učni načrt- Izbirni predmet : program osnovnošolskega izobraževanja - Okoljska vzgoja, Ministrstvo za šolstvo, znanost in šport, Zavod RS za šolstvo, 2004

Ferbar J, Vodopivec I, Cvetrežnik D, Glažar S, Hostnik I, Kralj M, Novak M, Velikonja A: Učni načrt – naravoslovje in tehnika, Področna kurikularna komisija za OŠ, Nacionalni kurikularni svet, Predmetna kurikularna komisija za naravoslovje in tehniko, 1998

3. Biodiversity educatin – local/regional natural habitats and native species of Hungary, Slovenia and Romania

3.2 Hungary

http://www.mme.hu/2017-ev-madara-tengelic

http://www.azevfaja.hu/nyitooldal

http://mttmuzeum.blog.hu/2016/12/16/a_2017_ev_rovara_a_nagy_szarvasbogar

http://www.haltanitarsasag.hu/azevhala_hu.php

http://www.gombazo.hu/faj.php?f=vilagito_tolcsergomba

http://evvadviraga.nhmus.hu/node/61

Figure 1: The European goldfinch: https://www.haziallat.hu/madar/diszmadarak/europai-tengelic-carduelis-carduelis/4428/

Figure 2: The fruit of the crab apple tree: http://www.turistamagazin.hu/a-vadalmafa-lesz-a-kozeppontban-2017-ben.html

Figure 3: *Lucanus cervus*: https://en.wikipedia.org/wiki/Lucanus_cervus

Figure 4: Hazel dormouse: https://www.youtube.com/watch?v=VsTUmEJ6PDw

Figure 5: Two giant catfish: https://sokszinuvidek.24.hu/mozaik/2017/01/01/a-harcsa-lett-az-ev-hala-2017-ben/

Figure 6: *Omphalotus olearius*: http://www.gombaportal.hu/modulok/gomba/egygomba.php?gid=31&nev=vil%C3%A1g%C3%ADt%C3%B3_t%C3%B6lcs%C3%A9rgomba

Figure 7: Snowdrop: http://ecolounge.hu/vadon/ezert-lett-vedett-noveny-a-hovirag

Figure 8: Moor frog: https://hu.wikipedia.org/wiki/Mocs%C3%A1ri_b%C3%A9ka

3.3 Romania

https://www.eea.europa.eu/publications

https://www.inaturalist.org/taxa/147154-Ursus-arctos-arctos

https://www.researchgate.net/publication/255062379_Physiology_of_the_European_brown_bear_Ursus_arctos_arctos

http://www.imperialtransilvania.com/2017/05/01/read-more/argomenti/places-of-interest-1/articolo/the-bison-reserve-in-hateg-a-unique-tourist-attraction.html

http://www.mmediu.ro/app/webroot/uploads/files/2015-12-22_Virgin_forest_Romania_Summary.PDF

https://whc.unesco.org/en/list/588

http://www.ddbra.ro/en/danube-delta-biosphere-reserve/danube-delta https://www.carpathia.org/en/natura-2000-sites/

http://www.editurasilvica.ro/carti/donita1/integral.pdf

http://www.fundatia-adept.org/?content=rural_culture

https://www.euromeat.ro/en/turcana/

http://journals.usamvcluj.ro/index.php/veterinary/article/view/4158

https://blogs.scientificamerican.com/tetrapod-zoology/the-turcana-and-other-valachians/

http://www.cunoastelumea.ro/rezervatia-zau-de-campie-patria-bujorilor-de-stepa-este-un-loc-unic-in-romania-si-in-europa-care-este-povestea-minunatelor-flori/

https://www.facebook.com/JourneytoTransylvania/posts/1724902761058297:0

https://en.wikipedia.org/wiki/Fire_salamander

https://en.wikipedia.org/wiki/Lesser_spotted_eagle

https://www.arkive.org/lesser-spotted-eagle/aquila-pomarina/

https://animalcorner.co.uk/animals/eurasian-wolf/

https://www.activewild.com/eurasian-wolf-facts-for-kids/

Figure 9: Eurasian brown bear (*Ursus arctos arctos*): https://en.wikipedia.org/wiki/Eurasian_brown_bear

Figure 10: European bison: https://en.wikipedia.org/wiki/European_bison

Figure 11: Turkana sheep: https://hu.pinterest.com/pin/447967494159859586/

Figure 12: Fritillaria meleagris: https://www.farmergracy.co.uk/products/fritillaria-meleagris-bulbs-uk

Figure 13: Paeonia tenuifolia: https://en.wikipedia.org/wiki/Paeonia_tenuifolia

Figure 14: Fire salamander: https://en.wikipedia.org/wiki/Fire_salamander

Figure 15: Lesser spotted eagle (*Aquila pomarina*): https://en.wikipedia.org/wiki/Lesser_spotted_eagle

Figure 16: Eurasian wolf: https://en.wikipedia.org/wiki/Eurasian_wolf

3.4 Slovenia

CBD on Biological diversity: Slovenia - Country Profile. Available on: https://www.cbd.int/countries/profile/default.shtml?country=si#facts,

Accessed: 9. January 2018

UKOM - Republic of Slovenia Goverment communication office: INTERNATIONAL YEAR OF BIODIVERSITY.

Available on: http://www.ukom.gov.si/en/media_room/background_information/international_year_of_biodiversity/international_year_of_biodiversity/

Accessed: 9. January 2018

List of deepest caves,

Available on: https://en.wikipedia.org/wiki/List_of_deepest_caves#cite_note-Speologilor-3

Accessed: 9. January 2018

10 Deepest Caves in the World,

Available on: http://www.conservationinstitute.org/10-deepest-caves-in-the-world/

Accessed: 9. January 2018

UNESCO The Škocjan Caves - World Heritage

Available on: http://www.park-skocjanske-jame.si/en/information/certifications/#a_unesco

Accessed: 9. January 2018

Škocjan Caves

Available on: https://www.slovenia.info/en/places-to-go/attractions/unesco-world-heritage

Accessed: 9. January 2018

UNESCO's global geoparks in Slovenia

Available on: https://www.slovenia.info/en/places-to-go/attractions/unesco-world-heritage

Accessed: 9. January 2018

Slovenia - Country Profile

Available on: https://www.cbd.int/countries/profile/default.shtml?country=si#facts

Accessed: 9. January 2018

Slovenian animal species

Available on: https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia

Accessed: January 2018

Distinctive Animals in Slovenia

Available on: https://www.myguideslovenia.com/travel-articles/distinctive-animals-in-slovenia

Accessed: 9. January 2018

Vivarium Proteus

Available on: https://www.postojnska-jama.eu/en/come-and-visit-us/vivarium-proteus/

Accessed: 9. January 2018

Carniolan honey bee

Available on: https://en.wikipedia.org/wiki/Carniolan_honey_bee

Accessed: 9. January 2018

The Carniolan bee

Available on: http://www.czs.si/wp/about/the-carniolan-bee/

Accessed: 9. January 2018

A unique – and endangered – species lives in the Soča River

Available on: http://www.rtvslo.si/news-in-english/slovenia-revealed/a-unique-and-endangered-species-lives-in-the-soca-river/334577

Accessed: 9. January 2018

Brown Bear

Available on: http://www.slovenia.si/visit/trails/brown-bear/

Accessed: 9th January 2018

Alpine ibex

Available on: http://www.slovenia-hunting.com/language/en/alpine-ibex/

Accessed: 9th January 2018

Alpine ibex

Available on: https://en.wikipedia.org/wiki/Alpine_ibex

Accessed: 9th January 2018

The golden eagle still soars above Slovenia

Available on: http://www.rtvslo.si/news-in-english/slovenia-revealed/the-golden-eagle-still-soars-above-slovenia/347054

Accessed: 9th January 2018

Krškopolje Pig – the only indigenous pig breed in Slovenia

Available on: http://www.rtvslo.si/news-in-english/krskopolje-pig-the-only-indigenous-pig-breed-in-slovenia/348351

Accessed: 9th January 2018

KRŠKOPOLJE PIG - Slovenian indigenious pig breed

Available on: https://fundus-agricultura.wiki/wp-content/uploads/krskopolje_pig.pdf

Accessed: 9th January 2018

Karst Shepherd

Available on: https://en.wikipedia.org/wiki/Karst_Shepherd

Accessed: 9th January 2018

Climate Change Post: Slovenia - Biodiversity Slovenia

Available online: https://www.climatechangepost.com/slovenia/biodiversity/

Accessed: 13th may 2018

Hlad B and Skoberne P (editors): Biological and Landscape, Diversity in Slovenia: An overview, Ministry of The Environment And Spatial Planning, Environmental Agency of The Republic of Slovenia, Ljubljana, 2001

Institute of the Republic of Slovenia for Nature Conservation (RSNC): Biodiversity in Slovenia, Available on line: http://chm.zrsvn.si/fol127270

Accessed: May 2018

Slovenia.si: Nature and biodiversity,

Available on line: http://www.slovenia.si/slovenia/country/nature-and-biodiversity/

Accessed: May 2018

4. Basic principles of sustainability

4.1 Sustainable learning

4.2 Sustainable consumption

4.3 Sustainable future planning

http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/

https://www.clubofrome.org/report/the-limits-to-growth/

http://www.un-documents.net/our-common-future.pdf

https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf

https://sustainabledevelopment.un.org/?menu=1300

http://www.iscvt.org/impact/definition-sustainable-community)

https://www.transitiontowntotnes.org/

http://www.un.org/sustainabledevelopment/sustainable-development-goals/

https://www.un.org/pga/wp-content/uploads/sites/3/2015/08/120815_outcome-document-of-Summit-for-adoption-of-the-post-2015-development-agenda.pdf

http://greencred.me

http://www.covenantofmayors.eu

http://www.iclei.org

https://transitionnetwork.org

http://en.focuseco.ro/2018/01/23/1036/ (Publication: Hajdu Zoltán: Változó élettereink)

http://en.focuseco.ro/wp-content/uploads/2018/01/webre.png (Publication Focus Eco Center: Spațiile verzi din perspectiva Obiectivelor de Dezvoltare Durabilă)

http://en.focuseco.ro/2015/08/09/consumer-sociaty-in-times-of-climate-change/ (Publication Focus Eco Center: Fogyasztói Társadalom a Klimaváltozás idején)

http://focuseco.ro/kiadvanyok/a-termeszet-leckei (Publication Focus Eco Center : A Természet Leckéi)

4.4 Sustainable ethics

World Commission on Environment and Development (WCED): Our Common Future (also known as the Brundtland Report), Oxford University Press, 1987, http://www.un-documents.net/our-common-future.pdf

Kibert C J, Thiele L, Peterson A, Monroe M: The Ethics of Sustainability, 2012,

Available online:
http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.1559&rep=rep1&type=pdf

Accessed: January 2018

Dawn C: Week 1 Ethical Behavior and Theory in Accounting, Jul 14, 2015;
https://www.slideshare.net/DawnChurch/week-1-ethical-behavior-and-theory-in-accounting

Accessed: 3. February 2018

Keeley F "Seeing the Light: KANTIAN ETHICS (ch. 2.4)"; 2012;
http://slideplayer.com/slide/3438142/

Accessed: 3rd February 2018

Wandolo C: Deontological Ethics, Dec 30, 2016,
https://www.slideshare.net/ChristineWandolo/deontological-ethics-by-christine-wandolo

Accessed: 3rd February 2018

Aquinas Rs: Lesson 4 key terms – teleological deontological; https://www.slideshare.net/aquinas_rs/lesson-4-key-terms-teleological-deontological; Sep 14, 2012;

Accessed: 3rd February 2018

Verrunggen R: Law and Ethics: Ethics Section; School of Computing, Dublin city University, 4/15/2017, http://slideplayer.com/slide/4373075/

Accessed: 3rd February 2018

MMM — Munson Mission Musings - Thoughts and Articles on Christian Missions Today - The Unethical Church. Part I; April 10, 2012, https://munsonmissions.org/2012/04/10/the-unethical-church-part-i/

Accessed: 3rd February 2018

Bryant L: Chapter 2: Introduction to Ethics; http://slideplayer.com/slide/6818197/; 2016

Accessed: 3rd February 2018

Clements G, Lecturer in Business; Intro presentation on business ethics; Nov 13, 2014; https://www.slideshare.net/grahamclements3/intro-presenation-on-business-ethics

Accessed: 3rd February 2018

Kavita P: Sustainable models; Mar 8, 2017; https://www.slideshare.net/Sunrisekavita/sustainable-models

Accessed: 3rd February 2018

Norton B: Searching for Sustainability: Interdisciplinary Essays in the Philosophy of Conservation Biology, 2002, Cambridge: Cambridge University Press.

Minteer B: The Landscape of Reform: Civic Pragmatism and Environmental Thought in America, 2006, Cambridge: MIT Press

Environmental ethics; 16, 2011;

Available on line :https://www.slideshare.net/sweetncool40/environmental-ethics-8325458

Accessed: 3rd February 2018

Newham College University Centre Stratford Newham: Lecture 9 ethical decision making; Nov 22, 2014; https://www.slideshare.net/kevins299/lecture-9-ethical-decision-making

Accessed: 4rd February 2018

FPSP: Ethical problem-solving and decision-making

Available online: https://www.mheducation.co.uk/he/chapters/0077099451.pdf; 2002

Accessed: May 2018

DuBois J M: Solving Ethical Problems – Analyzing Ethics Cases and justifying decisions, Chapter 3 in Ethics in Mental Health research, 2008, New York: Oxford;

Available online: https://philonew.files.wordpress.com/2015/12/solvingsthicalproblems.pdf

Accessed May 2018

Perera N: Ethical decision-making; Dec 2013;

Available on line: https://www.slideshare.net/tresdsdsd/04-ethical-decision-making

Accessed: 4rd February 2018

UCLA Extension Global Sustainability Certificate: Sustainability Ethics, 25th June, 2010;

Available on line: https://www.slideshare.net/uclaextensionppp/sustainability-ethics-course

Accessed: 4rd February 2018

Belyakov A: Ethical issues in Sustainability, Ph.D., ISSP-CSP, Secretariat of the Convention on Biological Diversity (United Nations Environment Programme); 21st Feb 2012; Available on line: https://www.slideshare.net/alex_belyakov/alexander-belyakov-ethical-and-philosophical-perspectives-and-their-relevance-to-sustainability

Accessed: 4rd February 2018

Dahl A L: Ethics in Sustainability Education, in Thoresen V W, Didham R J., Klein J and Doyle D (eds), Responsible Living: Concepts, Education and Future Perspectives, 2015, Heidelberg and Switzerland: Springer, pp. 27-40, DOI 10.1007/978-3-319-15305-6_3

IEF - International Environment Forum –(A Bahá'í inspired organization for environment and sustainability): Meaning, Values and Spirituality in Children and Youth, scientific symposium, Centre for Social Paediatrics at the Cantonal Hospital of Winterthur, Switzerland, and Club of Rome, 5-6 December 2013

Available on line: http://iefworld.org/node/657,

Accessed: 12th January 2018

Ashraf I, Mohd A A, Zadeh M N M S, Karnal N D R I: Environmental Ethics and Integrating Sustainability into Management Education: SMS; March-August 2011, Vol. IV, No.1

Doherty B. Doyle T: Beyond borders: Transnational politics, social movements and modern Environmentalisms, Environ. Politics, 2006, 15, pp. 697–712.

King, A: From sage on the stage to guide on the side, Coll. Teach, 1993, 41, pp. 30–35.

Antepohl W, Herzig S: Problem-based learning versus lecture-based learning in a course of basic pharmacology: a controlled, randomized study, Medical education, 1999, 3, pp. 106–113. doi:10.1046/j.1365-2923.1999.00289.x.

Spencer J A, Jordan R K: Learner-centred approach in medical education, British Medical Journal, 1999, 318, pp. 1280–1283. doi:10.1136/bmj.318.7193.1280. PMC 1115656 Freely accessible. PMID 10231266.

Holistic Education, Inc., 2003,

Available online: http://www.holistic-education.net/

Accessed May 2018

Kelly M: 10 Ways to Make Education Relevant, March 08, 2017,

Available online: https://www.thoughtco.com/ways-to-make-education-relevant-8084

Accessed: May 2018

Ravi V: Environmental education; 2016, Lulu publication NC, United States

5.Principles of inquiry based, experiential education and learning

http://www.kettealapitvany.hu/tapasztalat-elmeny/tapasztalati-tanulas/

http://www.borosandras.hu/oldalak/taptanreszlet.html

https://hu.wikipedia.org/wiki/%C3%89lm%C3%A9nypedag%C3%B3gia

http://www.osztalyfonok.hu/print.php?id=734#foldes

http://ideateam.hu/modszertan/tapasztalati-tanulas.php

6.-7.-8.-9. A Methodological Aid

https://tka.hu/tudastar_kereso

Spencer Kagan: *Cooperative learning – Teachers' handbook*

Andrea Óhidy: *The characteristics of an effective lesson (Az eredményes tanítási óra jellemzői)*

Learning based on cooperation – programme package (Az együttműködésen alapuló tanulás – programcsomag)

10.Everyday aspects of life in a built environment

Hungary

1. http://www.kamaszpanasz.hu/hirek/zoldovezet/5931/okologiai-labnyom

2. slide 1: junk: http://explorerworld.hu/2013/04/12/nem-bantja-a-szemet/

3. slide 2: garbage: http://recity.hu/muveszeti-alkotasok-hulladekbol/

4. slide 3: illegal landfill: http://www.infohodmezovasarhely.hu/hirek/olvas/illegalis-szemetlerako-lett-a-szegfu-utca-2016-05-10-163907

5. slide 4: selective garbage collection: http://www.tisztajovo.hu/kornyezetvedelem/2013/05/01/pecs-es-a-szelektiv-hulladekgyujtes

6. slide 5: recycled garbage: http://oko-piac-ter.net/kreativ_ujrahasznositas_otthon_1_resz/

11. Healthy lifestyle

Hungary

1. http://www.okosdoboz.hu/feladatsor?id=803&select_osztaly_search=osszes-osztaly&select_tantargy_search=egeszsegneveles&select_temakor_search=az-emberi-test

2. http://www.okosdoboz.hu/feladatsor?id=885&select_osztaly_search=osszes-osztaly&select_tantargy_search=egeszsegneveles&select_temakor_search=sport

3. http://www.okosdoboz.hu/feladatsor?id=916&select_osztaly_search=osszes-osztaly&select_tantargy_search=egeszsegneveles&select_temakor_search=sport

4. https://www.youtube.com/watch?v=u7bZtffveIY

5. Lelkünk működése/ Müller Péter/, extracts from the Internet about the causes and symptoms of anxiety, the ways of its solution.

6. www.pedagogusvilag.hu Pedagóguskiadás p. 3

7. The attachment of the magazine Tudorka year XIX issue 7

12. Biodiversity

Hungary

1.https://www.google.si/search?biw=1536&bih=759&tbm=isch&sa=1&q=otroške+panjske+končnice+slike&oq=otroške+panjske+končnice+slike&gs_l=psy-ab.3...61327.64293.0.65260.8.8.0.0.0.0.83.617.8.8.0....0...1.1

2.https://www.google.si/search?q=%C4%8Debelnjaki&tbm=isch&tbo=u&source=univ&sa=X&ved=0ahUKEwjz6eiYjoDYAhVC3KQKHQB8D34QsAQIJg&biw=1536&bih=759#imgrc=EDttWK_qOh3plM

3. The concept of protected species: https://hu.wikipedia.org/wiki/V%C3%A9dett_faj

4. The concept of composting: https://hu.wikipedia.org/wiki/Komposzt%C3%A1l%C3%A1s

5. Tutorial video: https://youtu.be/K3AYzWjfCpY

6. Music during making the piece of work and the exhibition: (The noises of the forest) https://www.youtube.com/watch?v=KEDlXpKwQqU

13. Environmental education from a global aspect

Hungary

1. http://slike.planet-lepote.com/xinha/slike/razno/voda_plastenka.jpg

2.https://trgovina.mercator.si/market/img/cache/products/5249/product_medium_image/00496708.jpg

3.http://www.partybox.si/image/cache/data/artikli/plasti%C4%8Dni%20kozarci/plasti%C4%8Dni-kozarci-500ml-600x600.jpg

4. slide 1: A Greek amphora: http://members.iif.hu/visontay/ponticulus/rovatok/hidverok/epigrammak-01.html

5. slide 2: Coffee art : http://www.thefrisky.com/2014-11-04/this-insanely-realistic-cat-latte-art-gives-hip-baristas-a-run-for-their-money/

6. slide 3: Notre Dame, Paris: http://uk.france.fr/en/discover/notre-dame-paris-cathedral

7. slide 4: Land art: https://land8.com/10-top-examples-of-land-art-from-around-the-world/

8. slide 5:A cover plate of Galgoc: http://vilagbiztonsag.hu/keptar/displayimage.php?pid=407

9. slide 6: Gugger Petter: A paper picture: http://hillcountryhouse.blogspot.hu/2010/08/artist-gugger-petter.html

10. slide 7: László Paál: A road to the forest of Fontainebleau: https://hu.wikipedia.org/wiki/Pa%C3%A11_L%C3%A1szl%C3%B3_(fest%C5%91)

11. slide 8: A fashionable bag – Garbage art: http://recity.hu/kiegeszitok-hulladekbol/

12. slide 9: Taj Mahal, India: https://en.wikipedia.org/wiki/Taj_Mahal

13. slide 10: Sand picture: http://hvg.hu/tudomany/3IZNQB_Elkepeszto_Uncharted_2_homokkepek_video

14. slide 1: Marcel Duchamp: The big bicycle wheel: https://sciart.eu/hu/2014-08-28-1008/998/lazadok-diszkret-baja-dada-es-szurrealizmus

15. slide 2: Pablo Picasso: Bullhead: http://hulladekboltermek.hu/cikk/1436/235492/20140902_szemet_a_muzeumban_1.htm