Framework curriculum for the optional subject of Sustainability
for grades 9-10, secondary schools
in Hungary

Sustainable development is a process that uses the current resources of the immediate and wider environment to safeguard, rather than diminish, the opportunities, living space and quality of life of future generations. This framework is designed in the spirit of strong sustainability, according to which all human activities are fundamentally determined by the Earth's carrying capacity. Since the environment, society and the economy are interconnected, problems should not be considered in isolation, but in the context of these interconnections, and sustainable solutions sought.

On 18 November 2010, the Council of the European Union adopted a Council Conclusion on Education for Sustainable Development[1] . It states that the most important role of education for sustainable development is to equip individuals and groups with the knowledge, skills and attitudes needed to understand and deal with the challenges and complexities of modern day life, whilst taking due account of the environmental, social, cultural and economic implications, as well as to assume their global responsibilities. The Council called on member states to take appropriate measures to promote the further development and use of education for sustainable development, so that it is integrated into education systems at all levels. The *National Framework Strategy on Sustainable Development* adopted in Hungary in 2013 aims to integrate the values and practices of sustainable development into learning and education. The UN's *Transforming our World: the 2030 Agenda for Sustainable Development,* adopted in 2015, includes sustainable development goals for all countries and all sectors up to 2030 to ensure a sustainable future. Goal 4 relates to quality education, its sub-goal 4.7 aims to ensure that all learners acquire the knowledge and skills necessary to promote sustainable development.

This framework curriculum sets out the learning outcomes, the competency focuses, and the knowledge elements required to achieve these competencies to be developed in a one-year, one-lesson-per-week subject in the 9th or 10th grade to prepare students for sustainable development. It also identifies the links that can be made with other subject content.

Sustainability is a priority area for development in the *National Curriculum.* The curriculum states that the next generation must learn to use resources consciously, sparingly and responsibly, with due regard for their renewable capacity. Institutions must also be involved in this learning process, as school settings are an appropriate means of enabling pupils to exercise their civic duties and rights in relation to the environment, learn about the

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[1] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:327:0011:0014:EN:PDF

economic and social processes that bring about change and crises, and learn about, preserve and enhance the values and diversity of their immediate and wider environment.

The processing of the learning material is based on students' prior experiences, everyday knowledge, and the related subject content they have learned. This curriculum provides a framework for developing a reflective and exploratory approach. In this framework, learning outcomes are to be achieved by flexibly adapting the content of the curriculum to local specificities, the place of application, the pupils' immediate and wider environment, and their prior knowledge and interests.

The Sustainability subject develops the key competencies set out in the National Curriculum in the following ways:

Learning competencies: sustainable development is itself a continuous learning process - the study of the interrelationships between nature, economy, society and the individual, often based on everyday experience. Students practice research methods while acquiring a research attitude and learning criteria of credibility.

Communication competencies: Identifying, understanding, and finding solutions in groups to complex problems resulting in unsustainable processes, using the methods of argumentation and debate, develops both oral and written expression skills. It encourages students to learn to summarise their opinions, support them with arguments, consider and discuss the arguments of others and seek solutions together.

Digital competencies: The exploration of global processes and problems relies on multiple data from different parts of the world, but the processing of local, national or regional data, and the making of forecasts, is increasingly possible with the development of computer models. The search for information, the verification of its reliability, and the interpretation of processes contribute to and motivate the development of digital competencies. The acquisition of competencies related to sustainable development requires continuous self-reflection and research. It inspires research work, evaluation and demonstration of research results by exploiting the potential of the internet and multimedia modelling. Digital literacy has a key role to play in understanding natural processes (e.g. climate models), monitoring environmental problems and values, and communication between people, which are also key areas for sustainable development.

Mathematical, thinking competencies: systems thinking, looking for correlations, analogical, associative, and analytical thinking are developed when examining areas such as climate change, healthy eating, or ecological footprint. Most problems lie at the interface of many disciplines, the identification and analysis of their common set and interrelationships require a logical mathematical approach, the ability to collect, analyse and prioritise data, and to interpret global and local statistical data. Systems thinking is an important element of engineering, science and ecological thinking: recognising and understanding interrelationships, analysing complex systems, considering the relationship of parts of systems to each other and to the whole, and dealing with uncertainty. Another important

element of engineering, science and ecological thinking is foresight: understanding and evaluating multiple future outcomes (possible, probable, and desirable); creating one's own visions of the future; applying the precautionary principle; estimating the consequences of actions; managing risks and coping with change. Reflection and problem-solving are essential elements of engineering, science and ecological thinking: examining and reflecting on routines, routines, accepted positions, formulating questions, reflecting on one's own values, perceptions and behaviour; formulating opinions and arguments in terms of sustainability objectives.

Personal and interpersonal competencies: small group cooperative techniques and collaboration are desirable ways of working on the learning material. This develops the key competence itself. Collaboration and knowledge sharing are part of the personal and peer competencies defined in the National Curriculum. Collaboration implies the ability to listen to others, decentralise and change perspectives. Taking part in the studies and discussions of sustainability issues, learning from others; seeking to understand the needs, perspectives and actions of others (empathy) belong to these competencies as well. Listening patiently to the arguments of others, formulating arguments supported by facts and seeking to resolve conflicts by consensus contributes to forming the culture of debate. The creative contribution to group problem-solving and the exchange of ideas and the debate method is an appropriate way to develop the competencies needed to promote sustainable development, exercise citizenship rights and learn non-violent communication.

Competencies for creativity, creative work, self-expression and cultural consciousness: The curriculum also covers topics related to the home and the built environment. The experiences with nature, the closer and wider built environment and the emotional elements of attachment to the home provide a way of recording and expressing experiences in writing, digitally, on photo-video or other means. Creativity is essential to solving sustainability problems, but environmental problems are themselves products of human creativity, which is why metacognition and self-reflection are key to exploring all creative solutions, bearing in mind the precautionary principle as set out by the EU. Metacognition, self-reflection in this context is the ability to reflect on our own role in the local community and in (global) society; to constantly assess and maintain our motivation to act; to deal with our feelings and control our desires.

Employability, innovation and entrepreneurship competencies: Understanding the economic aspects and causes of phenomena and processes is also a key issue for sustainable development. The analysis of trends can be linked to issues of career development, career guidance, anticipating future and present worker competences, and preparing for sustainable production and services. Project work, complex understanding of problems, is useful for starting up your own business or NGO, or for carrying out public service tasks responsibly. The ability to think strategically is an essential element of sustainability: responsible forward thinking, goal setting, simple problem identification, problem analysis, solution design, solution, evaluation and correction.

9th (10th) grade

The aim of the subject, which can be taken in grade 9 or 10, is primary to establish and develop a positive environmental attitude and to strengthen the understanding of sustainability rather than transfer lexical knowledge. This includes understanding the links between sustainable development and individual responsibility, supporting students to feel ownership of everyday problem-solving tasks within their own capabilities, and integrating this approach into their behaviour and thinking. They should follow the values of sustainability and organise their own lives in such a way that they contribute, individually and collectively, to the achievement of the SDGs.

The following sub-competences are necessary for attitudes, behaviours and lifestyles that support sustainable development (in line with the one-hour-per-week framework of the one-year subject):

SKILLS, ABILITIES	KNOWLEDGE	ATTITUDE
The student discovers the link between his/her own consumption and lifestyle habits and natural and environmental problems; can identify and give examples of what can be changed.	*Concepts*: sustainable development and sustainability; ecosystem services.	The student is committed to moving towards sustainable development and preserving environmental values; committed to building just, peaceful, cooperative communities and societies. He/she feels and assumes responsibility for the protection of his/her own activities and the natural environment and for cooperation with his/her social environment.
S/he creates a simple resource plan, that is realistic and matches her/his priorities, the time needed for activities and the sustainable use of available resources.	*Concepts*: vision; aspects of time management (complexity, prioritisation, measurement). *Processes*: how to plan for the future.	
The student designs and implements a programme of work - based on specified criteria - to achieve sustainability. Analyses, evaluates and presents the results of the work.	*Concepts*: work programme and project; the difference between needs and wants. *Processes*: the steps of work programme planning.	
By analysing a concrete problem, s/he recognises the interdependent relationships between the natural and built environment, individual behaviour and the socio-economic space around her/him; analyses, evaluates and recommends decisions that promote sustainability.	*Skills*: identifying the characteristics of systems, their elements and the relationships between them. *Processes*: a way of analysing interdependencies.	

The themes of the subject are closely related to the students' everyday experiences, while they are used as a starting point to highlight problems that affect their immediate natural, social, economic and environment or the planet as a whole. The learning method is primarily experiential and analytical, reflective thinking based on cause and effect, reasoning, debate,

collaboration and co-creation. Achieving the objectives and mastering the subject matter can be facilitated through a practice-oriented approach, experiential learning tools, and by stimulating curiosity and motivation.

The provides an opportunity to integrate the knowledge previously acquired in different subjects. It is therefore useful to build on the knowledge acquired at primary school or later by highlighting the links between them. The learning objectives cover cognitive, social-emotional and behavioural areas.

The teaching of the subject should aim at developing a responsible and enquiring approach, collecting and analysing data, comparing facts and opinions, and practising the methods of argument and debate. The subject requires practice-oriented, experiential and active learning. Methods should focus on exercises, games and projects that promote systems thinking and responsibility.

In order to increase efficiency, we recommend t work on the content that requires more in-depth study, and the exercises that require more time, in blocks of 2-2 hours or even in the framework of a thematic day. The framework curriculum can also be used to support the preparation for sustainability as a non-curricular topic – outside the classroom – in the afternoon.

The basic number of lessons in the subject chosen in grade 9 or 10: 34 hours.

Overview table of topics:

Topic name	Proposed number of hours
The meaning and goals of sustainable development	2 hours
Self-sustaining nature	5 hours
Consumption, fashion, recreation	6 hours
Staying healthy in an environmentally conscious way	6 hours
Room, building, settlement	6 hours
Leisure, mobility, transport	5 hours
Vision-building	4 hours
Total number of hours:	34 hours

TOPIC: Meaning and goals of sustainable development
RECOMMENDED NUMBER OF HOURS: 2 hours

LEARNING OUTCOMES
The learning of this topic contributes to the learner's ability, by the end of the education and training phase:
− learn about the approaches and knowledge elements needed to achieve sustainable development;

- understand what it means to balance between the needs and environmental opportunities;
- recognises the links between natural resources and society and the importance of social and societal equity in achieving sustainable development.

As a result of learning this topic, the learner:

- can interpret the services of an ecosystem;
- can consider environmental or social, economic decisions and their consequences through examples;
- is able to discover the systematic relationships between nature and the way of life in his/her own environment.

DEVELOPMENT TASKS AND KNOWLEDGE

- illustrate with examples the link between unsustainable and sustainable production and consumption patterns and environmental problems;
- understanding important ecological problems (e.g. climate change, waste production, biodiversity loss, pollution),
- linking ecological problems to each other and to specific social and economic phenomena;
- identify elements and problems related to sustainability in their own and their family's lifestyle.

CONCEPTS

- sustainable development goals
- resource constraints

PROPOSED ACTIVITIES

- resource analysis (e.g. interpretation of the Sustainable Development Goals adopted by the UN in 2015),
- creating a web of notions on the environment and sustainability,
- problem-solving based on own experience.

TOPIC: **Self-sustaining nature**
RECOMMENDED NUMBER OF HOURS: **5 hours**

LEARNING OUTCOMES

The learning of this topic contributes to the learner's ability, by the end of the education and training phase:

- identifies with environmental awareness and responsible living for nature;
- recognises that biodiversity conservation is a key element for the survival of humanity;
- learn about ways to preserve local values through ecotourism;
- recognise the negative environmental impacts of tourism and know how to manage them.

As a result of learning this topic, the learner:

- can illustrate the links between her/his lifestyle and the use of natural resources;
- can use some internet and mobile applications to learn about nature;
- knows that we use natural resources in all aspects of life;
- know about national protected areas, plant and animal species (especially those that occur in the immediate vicinity);
- is familiar with some ecotourism opportunities in Hungary and the Carpathian Basin;
- can argue for the importance of diversity in some complex ecosystems (e.g. forest, grassland) and the prevention of loss;
- knows some technological solutions based on processes and phenomena found in nature.

DEVELOPMENT TASKS AND KNOWLEDGE
- argue for the importance of protecting nature and enhancing biodiversity;
- promoting a life without microplastics;
- respect for nature and life;
- monitoring of the rules (e.g. nature walks, minimum disturbance of habitats during nature activities);
- treating biodiversity as a value;
- participate in community activities for the preservation of nature (e.g. tree planting, spring cleaning, bird feeding, community gardening).

CONCEPTS
- biodiversity
- native species
- invasive species
- ecosystems' services
- ecotourism

PROPOSED ACTIVITIES
- modelling the self-sustaining ecosystem;
- drawing up an action plan for the sustainability of own environment;
- Identify the links and contradictions between the services provided by some ecosystems in an area and the use of these services;
- planning an ecotourism activity;
- planning and organising in a small group a biodiversity conservation project (e.g. planting a tree, tending a school garden, keeping small animals in class, building a hornet hive) or an ecotourism tour, excursion or project in the school or in the place of residence (e.g. integrated into a class excursion);
- compiling nature conservation tasks.

TOPIC: Consumption, fashion, recreation
RECOMMENDED NUMBER OF HOURS: 6 hours

LEARNING OUTCOMES

The learning of this topic contributes to the learner's ability, by the end of the education and training phase:

− recognise the messages of consumer society and their consequences;
− distinguish needs from wants;
− understand the need and possible consequences of changing consumer behaviour (e.g. reducing the negative impact of consumer behaviour on the environment);
− recognises the role of social responsibility;
− the ability to carry out research (e.g. collecting national and international examples, good and bad practices).

As a result of learning this topic, the learner:

− can identify waste-reducing behaviours;
− knows the eco-labels of responsibly produced products and examines their content;
− understands the waste burden and global social and environmental threats of fast-changing fashion, especially clothing production and digital devices;
− knows the characteristics of the waste generated by the production and depreciation of digital devices;
− can list responsibly produced products.

DEVELOPMENT TASKS AND KNOWLEDGE

− separating needs from wants;
− prioritise the levels of waste prevention, reduction and management and collect examples of each option;
− alternatives to waste-free living.
− understanding the essence of a circular economy;
− personal commitments to protect the environment after careful consideration of their own limits and options;
− support for waste reduction activities;
− conscious consumption and shopping habits;
− working to reduce the environmental impact of individual consumption (e.g. organising a waste-free event).

CONCEPTS

− waste
− waste pyramid
− waste reduction
− whole life path
− fair trade
− circular economy

PROPOSED ACTIVITIES
- gathering concrete options against overconsumption;
- rethinking the wardrobe for sustainability;
- understanding the impact and purpose of advertising;
- to introduce the concept of the life cycle by analysing a selected object;
- sharing and expanding individual environmental habits;
- alternatives to waste-free living.

TOPIC: **Staying healthy in an environmentally conscious way**
RECOMMENDED NUMBER OF HOURS: **6 hours**

LEARNING OUTCOMES
The learning of this topic contributes to the learner's ability, by the end of the education and training phase:
- is capable of representing a complex approach that combines healthy lifestyles and lifestyles with sustainable development and environmental protection;
- understands the role of changing individual eating habits in relation to healthy lifestyles and environmental pressures;
- recognise the environmental impacts of food production.

As a result of learning this topic, the learner:
- understands the nature of health (biological, emotional, social, spiritual, mental dimensions);
- can routinely apply basic hygiene rules;
- knows that health is more than the absence of disease;
- knows the characteristics of good quality and adequate quantities of food with minimum environmental impact;
- knows the local economic stimulus of local food, the benefits of short supply chains and how to avoid risks;
- knows the positive effects of spending time outdoors, the relationship between stress and the contact with natural environment.

DEVELOPMENT TASKS AND KNOWLEDGE
- reasoning about aspects and possible ways of maintaining health, and waste reduction solutions linked to food consumption;
- arguing against health risks;
- a description of the causal relationship between a healthy environment and human health and each environmental element;
- planning a way to achieve a personal goal, taking into account one's own circumstances and those of the environment (e.g. lifestyle, nutrition, exercise, clothing, contact with nature);
- recognising the importance of protecting their own health and the environment;

- recognising the interaction between individual health and environmental awareness;
- distinguishing between needs and wants, reducing and optimising needs;
- favouring environmentally friendly food produced locally and/or transported more locally;
- a commitment to reducing food waste and recycling leftovers (conscious purchasing, composting, donating).

CONCEPTS
- components of health status
- food waste reduction
- composting
- the links between the state of the environment and health
- food-production-nutrition-health nexus

PROPOSED ACTIVITIES
- review and analyse your own health;
- garden design by habitat planning;
- to identify the presence of food produced with a significant environmental impact in their environment (e.g. palm oil in the food consumed by the family);
- preparing a healthy diet for the family;
- calculate the water footprint.

TOPIC: Room, building, settlement

RECOMMENDED NUMBER OF HOURS: 6 hours

LEARNING OUTCOMES

The learning of this topic contributes to the learner's ability, by the end of the education and training phase:
- understands the essence of an energy-saving approach and the lifestyle based on it;
- knows energy saving methods that can be applied in households and communities;
- know the potential of renewable and clean energy sources and their use,
- understands the possibilities and systems of environmental problem management;
- recognises the need for correct machine use, maintenance and ongoing care;
- understands the importance of building in harmony with the landscape and using natural local materials.

As a result of learning this topic, the learner:
- knows the main characteristics of a sustainable building: energy use, materials used, traditional and natural building materials and thermal insulation alternatives.
- knows examples of sustainable architecture from nature (e.g. ventilation systems for termite mounds to regulate temperature, insulation of bird nests);
- knows the process of urbanisation, its advantages and disadvantages, individual and community examples of how to take advantages and overcome the disadvantages;

- can distinguish and define the concepts of energy saving and energy efficiency;
- is able to design a community space (e.g. community park, house, schoolyard, municipal nature trail) with peers, preferably based on examples from nature, taking into account sustainability aspects;
- is familiar with environmental NGOs in and around his/her community.

DEVELOPMENT TASKS AND KNOWLEDGE
- examining the relationship between insulation and energy use;
- comparing the energy and water requirements of different products and services;
- mapping the school and its surroundings (immediate living environment, private room, flat) from an environmental and health point of view, and making suggestions for changes;
- contacting the relevant authorities for each environmental problem (local representative, municipality, national park management) or finding your own solution;
- integrating energy saving and efficiency into everyday life;
- reducing greenhouse gas emissions from domestic energy supply (role of wind, geothermal, biomass, nuclear, hydro, solar);
- learning about and supporting the work of environmental NGOs.

CONCEPTS
- the opportunities and importance of water and energy saving
- steps and significance of preparing an environmental map

PROPOSED ACTIVITIES
- calculating the cost of solar panels and the return on investment;
- collecting some building ideas from the animal world;
- drawing up a greening plan for the own environment;
- producing a water saving kit;
- designing a sustainable school or eco-community building.

TOPIC: Leisure, mobility, transport
RECOMMENDED NUMBER OF HOURS: 5 hours

LEARNING OUTCOMES
The learning of this topic contributes to the learner's ability, by the end of the education and training phase:
- knows the main environmental problems caused by transport: air pollution and environmental noise pollution;
- can map the domestic environmental impact of vehicle-related waste (production, operational and end-of-life waste);
- understand the advantages and disadvantages of different traditional and alternative transport modes;
- know how to calculate the direct and additional prices of goods and products.

As a result of learning this topic, the learner:

- knows that the environmental pressures and energy requirements of different vehicles differ;
- can compare cycling, walking, using public transport and car;
- knows about other pollutants in the air from transport and their effects, in addition to CO_2 ;
- knows how to calculate food kilometres;
- knows the possible side effects of transporting food from abroad (e.g. introduction of invasive plant and animal species, presence of previously unknown micro-organisms);
- knows the environmental impact of road transport and the possibilities to reduce traffic;
- understands the relationship between population trends, economic development, consumption and environmental pressures and their interactions.

DEVELOPMENT TASKS AND KNOWLEDGE

- explaining and justifying the disadvantages of cheap flights, comparing the advantages of flying with the disadvantages of environmental pollution;
- interpreting the carbon footprint;
- estimates related to the concept of food kilometres;
- estimates of the environmental impact of garments;
- the benefits of choosing local and locally produced foods and products;
- promoting environmentally friendly transport solutions.

CONCEPTS

- carbon footprint
- food kilometre

PROPOSED ACTIVITIES

- collect data on the carbon footprint of the class and interpret it;
- calculating students' and their family's carbon footprint,
- planning the use and maintenance of alternative means of transport;
- calculate the distance travelled by a food or its ingredients, or by a garment, and visualise it on a map;
- organising a trial week/month for the use of a lower emission mode of transport, and understanding the stagnation of overall emissions despite the use of increasingly "clean" means of transport.
- advertising to promote the electric car;
- create a social media campaign for the local municipality;
- exploring the potential of local c production.

TOPIC: **Vision-building**
RECOMMENDED NUMBER OF HOURS: **4 hours**

LEARNING OUTCOMES

The learning of this topic contributes to the learner's ability, by the end of the education and training phase:
– experiences the value of peer learning in knowledge-creating and sharing;
– recognises the advantages and disadvantages of globalisation and universalism in the world;
– understands the impact of the use of tangible and intangible resources on the environment, the economy and society;
– recognises the future-building role of the knowledge society in sustainable development.

As a result of learning this topic, the learner:
– is able to analyse data, data series and draw forward-looking conclusions from them;
– can plan a vision with their peers in a chosen area - for example, family, work, environment, digital device use, deforestation rates, waste production, climate change.

DEVELOPMENT TASKS AND KNOWLEDGE
– identifying sustainability problems at the local level and the cause-and-effect links between them,
– formulating proposals, individually or in groups, to solve sustainability problems at local level;
– examining and evaluating the facts and possible solutions from multiple perspectives;
– the appropriate use of digital tools.

CONCEPTS
– sustainable vision
– professions and the environment
– social responsibility
– volunteering

PROPOSED ACTIVITIES
– reflection on working from home (collecting positives and negatives);
– gathering the main challenges of the future;
– a web of ideas on the factors of climate change;
– depicting the past, present and future of a neighbourhood;
– collecting sustainability investment ideas.