YOUrALPS project

ALPINE SCHOOL MODEL

Educating Youth for the Alps

Alpine school

YOUrALPS project
Alpine School Model,
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Project Pilot Sites

Gymnasium Berchtesgaden, Germany,Berchtesgaden National Park, Germany
Volksschule und Neu Mittelschule Reichnitz, Austria
Nature Park Geschriebenstein, Austria
All nature park schools and kindergarden of Nature Park Rosalia – Kogelberg, Austria
Nature Park Rosalia – Kogelberg, Draßburg, Austria
Collège Andrè Corbè, Samoen France
Natural Reserve Sixt- Passy, France
Lycée Reinach Chambéry France
Parc Naturel Regional du Massif des Bauges, France
Parc Naturel Regional de Chartreuse, France
Parc National de la Vanoise, France
Parc National des Ecrins, France
Istituto di Istruzione Superiore Olivelli-Putelli, Darfo (BS), Italia
Parco Regionale dell'Adamello, Italia
Azienda Bergamasca Formazione/CFP, Clusone (BG), Italia
Parco Regionale delle Orobie Bergamasche, Italia
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Istituto di Istruzione Superiore Alberti, Bormio, Italia
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YOUrALPS
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Indice

1. Alpine School Model principles framework

1) Alpine School Model goals

YOUrALPS project main goal is to foster sustainable development-oriented education measures both in formal and non-formal education systems to raise awareness among youth on what attitudes, knowledge and skills for their professional and private life are required in order to promote the needed change in the world.
Alpine School Model (ASM) is designed for schools and non-formal educational organization in order they should share key elements focused on alpine area specificities and enhancing their collaboration.
Alpine School Model is intended to be a practical, simple to use, synthetical tool finalized to:

- Focus on alpine SD values, aims and specific issues, on pedagogical indications such are SD competences and innovative methods,
- Capacity building occasion to exchange contents in a specific network (recommendations, suggestions, examples, best practices),
- Enhancing stable relations between schools and non- formal education's organizations,
- Valorizing MoE subjects within specific certification procedures.

Alpine School Model targets are learners, educators, officers and school/organization staffs.
Alpine School Model is ultimately intended to engage different target groups in improving some important competences under the light of the Education for Sustainable Development (ESD):
during the month of December 2018 and will last until the end of June 2019.

- For learners, awareness and commitment with alpine Sustainable Development (SD) values and alpine key SD issues; decision making and action competences on alpine sustainable development perspectives; enjoyment of alpine natural and cultural heritage; experiencing outdoor activities,
- For educators, adopting innovative educational facilities to foster ESD issues and requirements, in interconnecting several elements basis of pedagogical work; motivate students to tackle alpine key SD issues at a level where they can see tangible results, soliciting them to realize that they really can make a difference; Involving school staffs, local stakeholders and the whole local communities in educational tasks,
- For school and non-formal education organizations officers and managers, to enhance awareness on regulations related to the different aspects of sustainable development and its practical significance related to different roles of responsibility, knowledge and skills related to the management of sustainability issues and methods of education Information about possible solution and resources for the education for sustainable development tasks.

What Alpine School Model is not

Alpine School Model provides all elements needed in a pedagogical perspective and is integrated with other project outcomes such all project YOUrALPS researches, but it isn't an handbook, not providing any instructions or tight arrangements.
ASM it isn't expressly target group-oriented since all elements have then to be adapted to learners age and needs.

2) Alps as educational opportunity and resource

Alpine area is the result of an intense geological and geomorphological, ecological but also cultural process that across the eras and the century of history shaped our European continent, favoring the manifestation of high biodiversity of landscapes, species endemism and sensitive environments and several cultural manifestations.

Mountain peaks and glaciers, wide biodiverse extensions of woods and moorland, pastures and plains, peatland and streams, rivers and lowland valleys, tiny villages and small cities. Within small distances different exciting environments alternate and follow each other, performing awesome sight, offering surprise and new perspectives for youth experiences.

Plunge into Alpine nature can provide a multitude of opportunities to promote educational processes: alpine locations offer the chance to enhance acquired knowledge and offer to individuals the opportunity to learn about themselves.
The Alps with their challenging, wild environments and a rich, long-lasting cultural heritage, can be perceived as powerful spaces inciting the curiosity to explore it: "Trees want to be climbed, berries want to be eaten, mushrooms want to be picked and animal tracks want to be identified and followed, unknown flowers, ferns and mosses want to be identified, bushes are alluring hiding places, insects want to be studied at close range, animals assumed to be there want to be found, sounds want to be investigated and strange smells identified and the sudden outburst of color in the autumn wants to be explained[1]".

Challenging mountain outdoor in a variety of ecosystems and cultural landscapes can provide the chance for personal evolution and growth.
The Alps may play also a crucial role as innovative labs for sustainable development practices based on innovative land-use models and sustainable exploitation of natural resources/services coupled to more attractive living opportunities. The Alps are suitable to become strategic areas for new economic and social models because of their intrinsic potential, able to exploit a territory-specific approach and specific instruments.
To preserve natural and cultural heritage and, at the same time, to promote economic competitiveness and societal attractiveness, it is necessary "...fostering green skills with further development of training and academic programs" as stated by the Alpine Convention's- Sixth Report on the State of the Alps[2].

3) Alpine School Model background paradigms

Education for the Sustainable Development (ESD)

Debates leaded at international level highlighted ordinary education limits in the training experiences of Education for Sustainable Development (ESD). Ordinary education difficultly provides an adequate understanding of the causes of un-sustainability, nor attractive solutions and it isn't enough connected to the real world.
Education for the Sustainable Development (ESD) empowers learners in becoming change makers, capable to make informed decisions, to perform responsible actions, to access to lifelong learning, to participate in economic and socio-political debates and building processes. ESD addresses learning contents and outcomes, pedagogy and the learning environment, integrating and engaging with all the issues related to the Sustainable Development within the school curricula, shaping a learner-centered and interactive teaching setting, promoting SD-oriented competences, fostering inter- and trans-disciplinary approach, linking formal and non-formal education[3].
According to the scientific literature and the related international debate, Education for Sustainable Development is recognized as being based on:

- an integral part of quality education,
- a holistic vision of the integral human development,
- a competence-oriented approach,

1 - Becker, P., INTO THE WOODS (2011): Some Remarks on the Cultural and Biographical Significance of Woods and Wilderness in Youth Work in Into the Woods: About the significance of wood and wilderness for youth work in Europe – EOE Conference
2 - Permanent Secretariat of the Alpine Convention (2017): Greening the economy in the alpine region - Report on the state of the Alps- Report on the state of the Alps in ALPINE CONVENTION Alpine Signals – Special Edition 6
3 - Adapted from "Education for Sustainable Development Goals: Learning objectives", Unesco 2017
4- Adapted from "Education for Sustainable Development Goals: Learning objectives", Unesco 2017

- training for living and acting in complex situations
- a motivation for changing lifestyles and behaviors[4].

Mountain oriented Education (MoE)

According to YOUrALPS researches, (ESD) and environmental education (EE) form the basis for mountain-oriented education (MoE).

MoE emphasizes the interrelations between mountain regions and society and MoE enables youth to face and shape the present and future grand challenges in that it strengthens capacity, competencies and resilience among them on the basis of the rich alpine cultural and natural heritage.

MoE is not to be understood in competition with ESD or Environmental Education but rather as an approach to valorize the regional ESD learning potential in mountain regions, following the principles of education for sustainable development (ESD) (UNESCO 2014; UNESCO 2017), "ESD empowers learners to take informed decisions and responsible actions for environmental integrity, economic viability and a just society, for present and future generations, while respecting cultural diversity. It is about lifelong learning, and is an integral part of quality education. ESD is holistic and transformational education which addresses learning content and outcomes, pedagogy and the learning environment. It achieves its purpose by transforming society."

YOUrALPS researches showed that already existing structures in the formal education such as system flexibility or cross-curricular teaching can be used in each of the five EU alpine countries Austria, France, Germany, Italy and Slovenia, and new structures need to be created.
The status quo of MoE is different throughout the alpine territory. Establishing MoE in the public school's system will be a complex process, which can be regarded as a transition itself. Since school systems and political structures are massively diverse even throughout the Alps, it is only possible to give general recommendations and highlight directions in which the national actors should steer in order to advance the formalization of MoE.

Outdoor learning theories and experiences

ASM backgrounds benefits of course of all Environmental Educational and Outdoor Learning traditions, experiences and reflections, in promoting the direct experience through skilled teaching, interpretation or facilitation, learning through what they do, through what they encounter and through what they discover, developing learning skills of inquiry, experiment, feedback, reflection, review and cooperative learning. Examples of this are the networks of European Outdoor Education and Real Education.

Non-formal education and learning

"Education that is institutionalized, intentional and planned by an education provider. The defining characteristic of non-formal education is that it is an addition, alternative and/or a complement to formal education within the process of the lifelong learning of individuals. It is often provided to guarantee the right of access to education for all. It caters for people of all ages, but does not necessarily apply a continuous pathway-structure; it may be short in duration and/or low intensity, and it is typically provided in the form of short courses, workshops or seminars. Non-formal education mostly leads to qualifications that are not recognized as formal qualifications by the relevant national educational authorities or to no qualifications at all. Non-formal education can cover programmes contributing to adult and youth literacy and education for out-of-school children, as well as programmes on life skills, work skills, and social or cultural development" (UIS-UNESCO 2012; quoted in UIS-UNESCO 2017).
"Learning which is embedded in planned activities not explicitly designated as learning (in terms of learning objectives, learning time or learning support). Non-formal learning is intentional from the learner's point of view" (CEDEFOP 2008).

Comments (CEDEFOP 2008):

- non-formal learning outcomes may be validated and lead to certification;
- non-formal learning is sometimes described as semi-structured learning."

4) Alpine School Model theoretical pedagogical framework

MoE follows the learning theory of moderate constructivism and conceptual change that can be seen as the current leading paradigm in learning research. Learning is particularly effective when learning situations are interlinked with learners' lifeworld perceptions (Duit 1995). According to the psychological perspective of constructivism, individuals form much of what they learn and understand based on their prior learning, knowledge and social interaction (Brooks & Brooks 1999). In a moderate constructivist understanding, learning is seen as a process that is individually constructed, self-determined, social, and situated (Widodo 2004). Combined with the conceptual change theory (Vosniadou et al. 2008), moderate constructivist learning settings ("learning pathways") attempt to use a deepened understanding of processes that lead to conceptual changes among the participating individuals. "Conceptual change [is] learning where the pre-instructional conceptual structures of the learners have to be fundamentally restructured in order to allow understanding of the intended knowledge, [e.g.] the acquisition of science concepts" (Duit & Treagust 2003). Results of thorough literature research reveal that higher self-determination in learning processes lead to more successful learning. Therefore, education has to provoke thought and stimulate interest instead of being directed unquestionably against "right" values and normative, pre-set goals because a teacher who is trying to change student attitudes and behaviours might have negative effects, especially on adolescents (Olsson & Gericke 2015).

Active participation doesn't exclude direct instructions or lectures automatically, e.g. if they serve for providing a certain common knowledge base or are more efficient than other forms of knowledge transfer; every instruction should be led by the guiding principles of effectivity and careful deliberation. "Results from a meta-analyses comparing the effectiveness of classroom vs non-traditional settings (e.g., nature camps and field studies) suggest that classroom based programs more effectively influenced behavior" (Duerden & Witt 2010).

5) Alpine context drivers for Educational Sustainable Development purposes

All the educational effort should focus on specific drivers at the alpine regional scale, in order to set modern and innovative solutions for strengthening the future of communities. Sustainable Development Key issues suggested in SDGs of UNESCO Agenda 2030 were prioritize and deepen for the alpine context, highlighting their interconnections and mutual dependence, through the identification of three main strategic pillars underpinning relevant themes and associated values and linked to international and UE strategic issues as underlined in several documents on sustainable development focused on the specificities of Alpine areas.

Pillar 1 – Environmental

Nature protection

Alpine systems, due to their topography, have many sites with a specific microclimate and this is one of the reasons for the high alpine biodiversity, that make the alpine area as one hotspot for habitat and species diversity. Biodiversity conservation in its comprehensive meaning, including the diversity of species, of ecosystems and habitats, should be one of the more critical and founding issues for ASM. Fostering biodiversity requires actions in enhancing:

- ecological connectivity within the development of a strategically planned natural and semi-natural areas networks, within land and water spaces, inside and outside protected areas, functionally interconnected with Natura 2000 sites,
- species preservation and wild population conservation, especially for endemic ones and of critical species

such are large carnivores and wild ungulates, alpine endemic flora and invertebrate taxa, according to priorities indicated by scientific research and monitoring activities outcomes,
- ecosystem and degraded habitats preservation and restoration and effective management of ecosystem services such are supporting services (nutrient cycling, soil formation, primary production), provisioning functions services like freshwater and energy reserves, and finally regulating functions such are climate, flood, disease regulation and water purification.

Cultural and agro-managed landscape conservation

The Alps are strongly characterized by cultural landscapes as the product of traditional human activities in natural resources exploitation which are present also at high altitudes, is traditionally marked by the great biodiversity and characterized by the coexistence of both natural and rural landscape. Those landscapes are the result of traditional skills and expertise in natural, agricultural and forestry management. In order to keep high levels of biodiversity and species richness, traditional and sustainable agriculture and farming practices must be promoted and supported in alpine areas in order to keep cultural and ecosystem services provided by mountain ecosystems. Farming and forestry have always been central to the Alpine economy and way of life. Not only do they provide food and wood for local consumption and export but play a vital role for local populations and maintaining a landscape that protects against soil erosion, floods and avalanches.

Climate change Adaptation and Mitigation

Climate change and its foreseeable effects on the environment, biodiversity and on the living conditions of its inhabitants is impacting more on alpine territories where is manifesting an exceptionally high-temperature increase twice the average warming rate of the northern hemisphere. This is likely to have a significant impact on the Alpine environment, which is sensitive, biologically rich and shows strongly localized biodiversity in small areas, for this reason, some impacts are already being clearly observed, such as distribution shifts in plant species, changes in the hydrological cycle, permafrost thawing, and glacier retreats. Promoting carbon-neutral economy and lifestyle through mitigations and adaptation actions will help driving sustainable development generating added economic value, innovation and boosting employment.

The Alps are among the areas most vulnerable to climate change in Europe and they also have a function as an early warning system for natural hazard. Natural hazards play an outstanding role as the primary source of vulnerability with the increasing exposure of settlements and infrastructure for the improvement of floods, debris-flow, mass movements, avalanches, forest fires. Cost-effective ways of natural hazards management are based on the availability of natural oriented solutions, e.g. the hydrological processes across the whole catchment to increase water retention capacities, reconnecting the river with their floodplain and restoring natural flows, wetlands and agricultural storages in order to slow down floods, increasing sustainable drainage with permeable surfaces.
Important measures to pursue in reducing GHG emissions:
- implementing renewable energy and energy efficiency in buildings and productive sites, energy saving constructions, in keeping sustainably, securely and affordably management demand, these include smart energy-efficiency networks and voluntary schemes for enterprises,
- improving incentives for low-carbon transport modes and encouraging the introduction of low-carbon vehicles and alternative fuels in public transport throughout the Alpine territory, contrasting noise and air pollution, and promoting a more accessible and interconnected network of public transport and infrastructure with inter-modality and interoperability in passenger and freight transport solutions in particular supporting modal shift from road to rail and promoting Green Infrastructure solutions as complementary solutions to Grey infrastructures,
- promoting low-carbon in housing warming and air-conditioning solutions.

Beside mitigation activities, it would be necessary considering the adaptation policies, in order to valorize actual constraint due to climate change effects as opportunities of Alps sustainable development. The adaptation to average temperature increases conditions will enhance the role of alpine areas in winter tourism, extending huts and pastures structures and seasonal alpine lake landscapes, as much as the extension of farming and breeding activities to heights.

Natural resources exploitation and management

Human communities depend for their survival on natural resources (metals, minerals, fuels, water, land, timber, fertile soil, clean air and biodiversity), in order to keep health, well-being and quality of life. Natural resources sustainable exploitation has to be promoted in Alpine regions where productive cycles must concern limits of ecosystem's carrying capacity towards Circular local economy within management of resource stocks, inputs reduction, optimizing production processes and consumption patterns, minimizing waste and boosting recycling.

Following items have to be considered:

- Keeping the multifunctional role of mountain forests in mitigating the risks posed by natural hazards, with adaptive management solutions, sustainably maintaining forest wood and non-wood production
- protecting of soil as a scarce resource which in mountain area is renewable only during several generations and at high costs, in minimizing or even avoiding land take and loss of productive soils, reusing brow fields,
- promoting sustainable and integrated management of the water resources in river restoration and sediment management. The Alps providing much of Europe with freshwater for drinking, irrigation, industry and electricity generation, water management requires an integrated approach to ensure a fair and rational use of this resource and preventing potential conflicts in water-demand and supply management. Promote water saving in all areas by supporting an integrated approach of the resource.
- improving waste management reduction and waste recycling rates.

2. Socio-economic pillar

Social & economic transformations have weakened the competitiveness and social attractiveness of the alpine productive systems and have also led to a progressive abandonment of mountain territories affecting the peculiar relationship between human communities and mountain environment, harming their historical co-evolution and disrupting a long-lasting resilience capacity based on:

1. Management of complex ecological habitats and ecosystem services,
2. Mountain land protection from natural risks,
3. Traditional agriculture and forestry practices,
4. Original know-how, skills and expertise to tackle environmental challenges,
5. Social cohesion and cooperation capabilities.

Alps have been deprived of human and technological resources and have lost a traditional capacity of land transformation and spatial planning. In forwarding a vision of Alps future to underlying ASM values, alpine local communities should be supported in building innovative social and economic more sustainable features such are natural capital as well as quality of life and wellbeing-based economy, valorizing the perception that limited possibilities could be the opportunities of innovative development.

Green Economy is an instrument to achieve sustainable development referring to UN Sustainable Development Goals, but also other sustainable development goals have strong linkages to Green Economy. EU policies on Europe 2020 strategy still considers the concept of economic growth as a competitive factor, but it also introduces the issue of properly assessing well-being.

Sustainable and cohesive communities

Due to the steepness and height of the terrain only a small portion of the whole of the Alps' area is suitable for permanent settlement and the actual demographic situation is characterized by over-aging and the abandon of mountainous territories. An important challenge for Alps future could be building strong, cooperating and cohesive communities able to face intensive changes and impacts, contrasting natural instability risks, poverty, abandon, isolation through the promotion of ethical values such are endurance, solidarity, inclusion. Communities have to be efficiently connected internally and with external contests through the digitalization process and the accessibility to services which are provided by public authorities.

Finally, the evolution of the job market towards green jobs should offer new opportunities of economic well-being and trigger a more socially inclusive development. The promotion of regional sustainable products should be fostered in order to contribute to the well- being of residents while supporting regional producers and economies.

Towards a green alpine economy

One of the main challenges is about keeping sustainable mountains economies, safe and long-term resilient. In order to reach this goal, it is important to improve economic features characterized by several innovative elements:

- ecosystem services economic value assessment with different payment models and incorporation of external environmental costs, into the market prices, using innovative concepts and instruments,
- eco-innovation for technological and non-technological solutions
- youth involvement in the labor market, creating future-oriented jobs characterized by high level of sustainability (Green jobs), within a dual vocational training as a base of the economic system.

These conditions have to be reached through the different economic sectors:

- sustainable rural development with the promotion of employment and job opportunities by sustaining farmers in adopting multifunctional and sustainable agriculture schemes and sustainable farming practices especially in production and marketing of quality food products. Particular attention has to been paid to organic agriculture experiences in mountain traditional productions,
- Mountain forests provide services to local and wide regional communities and the design of compensation/payment schemes or other market-based instruments could help ensure a long-term provision of these vital services,
- For the industrial sector, the use of ICT can help to develop new market potential and to bridge physical distances along with the creation of new low-carbon and innovative clusters and smart specialization strategies in cooperation with competence center,
- The alpine tourism sector should transform into a sustainable, low-impact, eco-friendly tourism in respecting mountain areas carrying capacity in natural cycles and ecosystem services, in order to keep competitiveness in adapting to climate change challenges, helping in maintaining permanent populations in the mountain towns and villages, stimulating a growth that in turn attracts other business. New solutions would be provided in energy efficient buildings and structures, using low energy technologies in hotels and leisure complexes, and through sustainable mobility features in switching to public transport.

Cultural heritage preservation

Cultural heritage preservation must be one of the keys to institute and keep resilient socio-economic systems. Cultural heritage ranges from traditional knowledge in adapting to heights, handcraft expertise, to the conservation of historical vestiges, sites, markers, monuments, figurative arts (villages, buildings, churches, paintings) and typical architecture features.
Keeping the diversity of languages and dialects spoken in remote areas and gradually dying out as much as cultural practices related to food heritage, traditional knowledge on production techniques, consumption customs and rituals and the transmission of ancient wisdom are all elements of the identity awareness construction process.

3. Governance pillar

Transnational cooperation and policy- making

The Alpine area is composed of territories with contrasted demographic, social and economic trends and a great cultural and linguistic diversity. This diversity goes along with a great variety of governance systems and traditions. Both the common specificities of the Alpine area and its variety and diversity addressed to common challenges call for strengthened cooperation to achieve economic, social and territorial development and offer a wealth of opportunities for addressing problems solutions at the appropriate governance level. Alpine Convention provides a platform for the development of a joint framework for an Alpine mountain policy in order to set up common approaches, transnational instruments and regional cooperation beyond national borders. The EU Strategy for the Alpine Region (EUSALP) aims at further expand cooperation and coordination between the Alpine regions within strategic priorities such are competitiveness, prosperity and cohesion, accessibility and connectivity for all the inhabitants of the Alpine area in terms of transport systems and a better digital network and promotes common strategies against natural threats and common programs in the field of renewable energy and energy efficiency. EUSALP aims at providing significant inputs through its Action Groups relevant for the Alpine Convention thematic areas.

Participatory processes and local political perspectives

Bottom-up governance, through the promotion of participatory processes, involving various population target groups, allows to successfully identify and implement integrated solutions at different administrative levels. New participatory processes for young people should be promoted besides the Youth Parliament Alpine Convention which is a platform for cultural exchanges and networking among young people from different regions to discuss current topics regarding the Alpine region in a parliamentary simulation.

Participatory processes would be a way to profitably involve young people in order to foster self-determination, and action taking in a political refreshment perspective, both in institutional and civil societies contexts and in arising identity awareness towards the achievement of new societal values for alpine areas.

Funds and cooperation tools incentives

In order to promote UE policies application at the local level, would be useful fostering the access to several European funding programs, in order to boost competitiveness, social cohesion and development of the alpine area, especially by young people. Vocational schools should promote in their curricula competence, training bases in EU project designing and making.

2. Alpine School Model structure and elements

1) A pedagogical holistic model

In a pedagogical way, ASM aims at codifying what specific elements are needed for an efficient and comprehensive MoE practice, in line with ESD concerns and indications: an innovative and concrete approach useful to help students and youth, connecting with alpine territories and cultures and to plan their professional life, according to the green economy policies and advice.

In order to be effective in a pedagogical way, all elements in the model have to be coherently linked one to each other in a systemic framework. Educators will be enabled to check what elements would be more suitable and useful for their educational planning and then select them in an autonomous way in order to generate a creative and original MoE project. To suggest a vision of the whole model, synthesizing components consistency and their functional relation, Alpine School Model is based on a set of criteria aiming at strengthening the educational frame for alpine sustainable development in the schools and within their living territories and communities.
ASM foresees operational indications for schools in order to support the adoption of each criteria fulfillment. In the following table, a set of criteria and their description are presented with the related supporting documents and tools provided by the ASM, in the following chapters.

The ASM ten criteria correspond to steps of designing ASM friendly projects and activities which result from the achievement of all, or at least most, of the indicated conditions. A well-balanced project drives contents within the activation of the sphere of values, always keeping in mind that education must be fostered through mind, body and emotions, without avoiding any of those dimensions. Values respond to the question "why doing this?". If the motivation that pushes action is not clear, then consequent action will result weakened. But once answered to the previous question, and reached awareness on it, in order to keep learner's enthusiasm and interest high, it will be necessary to structure a strong scaffolding in planning the adequate knowledge and required skills and attitude. Topics and their translation in a project target, goals and implementation phase with the help and the collaboration between well-planned cross-curricular formal lessons and interdisciplinary recurring non-formal interventions, will be an important step to substantiate the start intentions. Always paying attention to learner' individual way to activate and integrate mind, body and emotions, learner-centered suggested methods will be useful in order to reach the required competencies. Outdoor educational techniques and approaches ensure the emotional involvement and physical performance of the project. Finally, attention to how to share best practices within a wider community of practitioners at a transnational level and to transfer acquired information, knowledge and skills in a real context will be suggested.

It is important to say that as much as ASM could be used in a very simple way as a Handbook to activate projects and activities in schools (also for city schools willing to approach regional alpine contexts) and, for example, used for day visit, project days and a spot or a long visit proposal, the preferable solution is represented by the track for continuative ASM related projects in School offer plan and most of all the possibility to structure a School curriculum within Alpine school Model: during the school year teachers and non-formal organizations collaborate in planning and implementation setting, within the school lesson alternate to visit/outdoor experiences, as shown in the diagram below.

In the following is provided a possible example, from one pilot site experience, on how school curriculum should be planned on the basis of specific alpine natural and cultural heritage (from ISC Damiani – Morbegno, Italia).

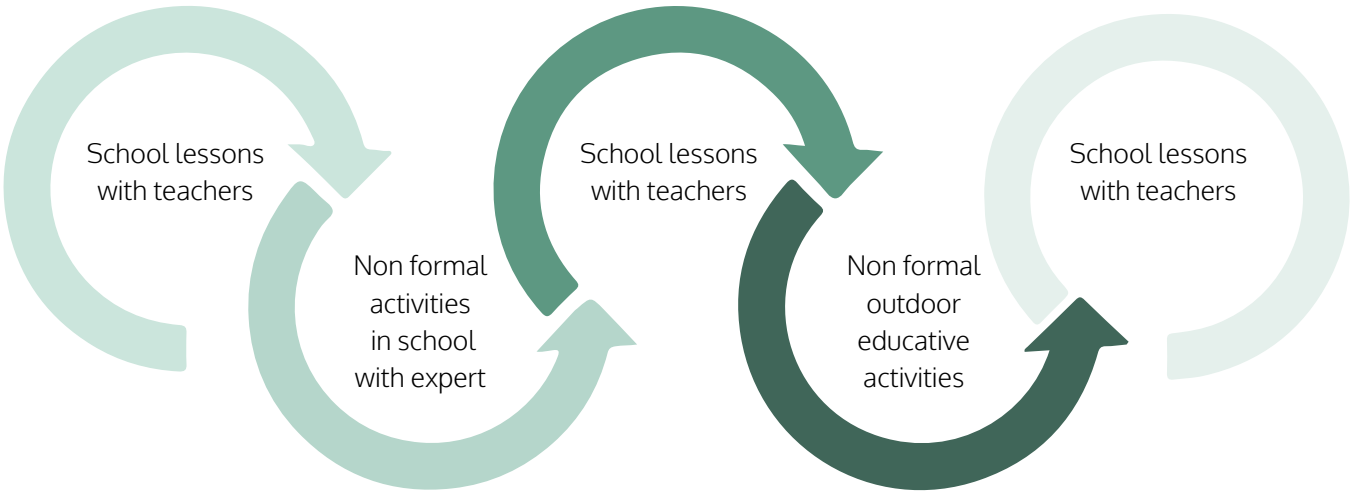
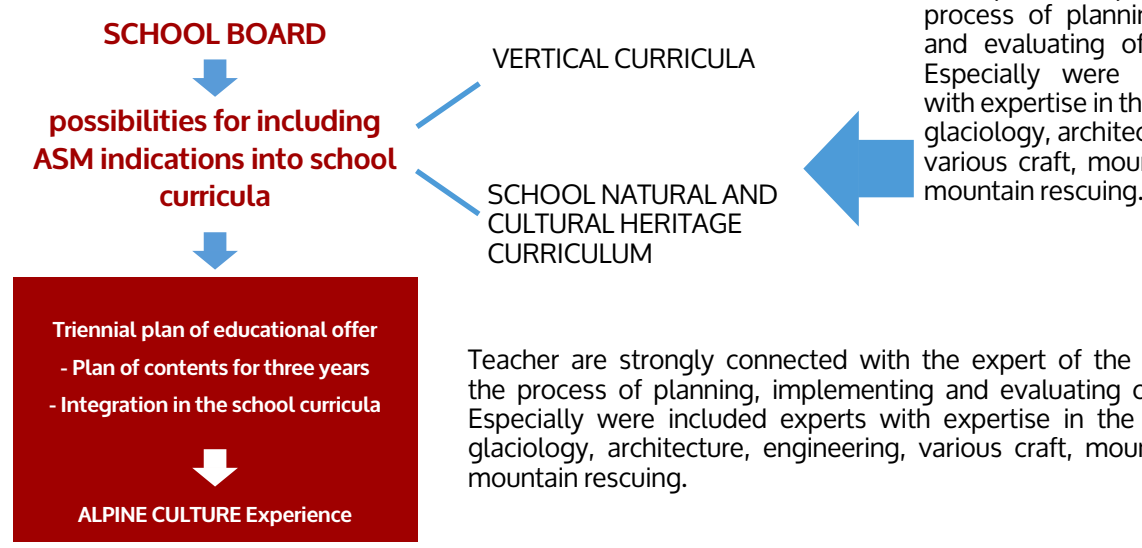


Figure 1 – The process of work in schools within the Alpine School Model Indications



Teacher are strongly connected with the expert of the protected area in the process of planning, implementing and evaluating of project actiona. Especially were included experts with expertise in the field of geology, glaciology, architecture, engineering, various craft, mountain guiding and mountain rescuing.

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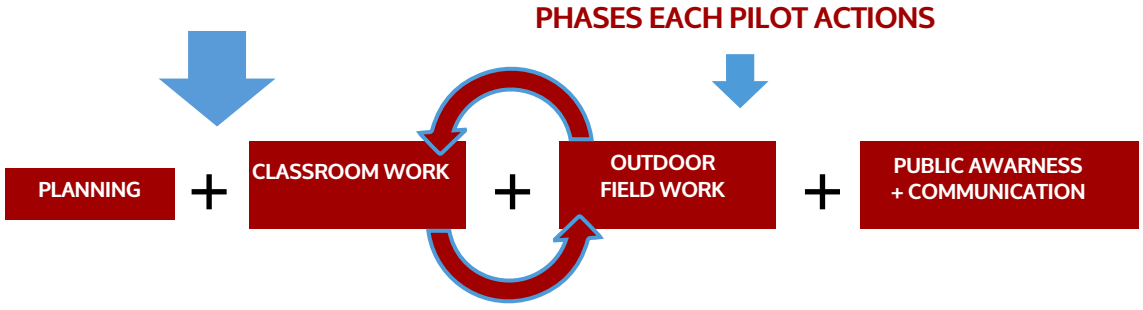


Figure 2 – Example of the application of the Alpine School Model in the school planning work flow

The ultimate grade of ASM application is a path for certifying organization within ASM requirements.
In the following diagram are presented the Alpine School Model indication as project building steps that will be presented and illustrated in the following chapters of the present document.

ASM INDICATIONS	PROJECT BUILDING STEPS	ASM SUPPORT
Integration between formal and non-formal education actions	Cooperation with several non-formal educational organizations are required in order to foster an interdisciplinary approach to alpine Key SD Issues, experiential and real-life linked learning and outdoor resources in learning settings Teachers and Non-formal educators plan and implement together educational interventions within same structured tools	Presentation of possible non-formal activities and related skills Unity of Learning Planning form
Setting project goals	Achieve information on local problems, and realistic ambitious goals to be fulfilled within the project	Prospect of SDGs Annex 1
Founding project interdisciplinarity enhancing alpine key SD related issues	To understand the multidimensional nature and causalities of sustainable development issues and the changes happening in the educational projects focus on local more critical key SD issues integrating Environmental, Socio-Economic and Cultural aspect with particular attention to Governance aspects	ASM key SD issues and sub-topics frame and description
Setting didactical contents within a cross-curricular perspective	Schools curricula are planned in a way to face alpine Key SD issues in a very interconnected way through all school subjects	ASM topics and school subjects
Dealing with SD critical values in the local mountain area	Learners have to become familiar with the significance of the SD values they want to carry on within their activities. Teachers and non-formal educators support learners in analyzing personal values to understand and be aware of values carried in alpine Key SD Issues activities and project. Sustainable MOE values should ultimately inspire in the official values of the whole school and non-formal organizations involved in the educational path and the values are then well communicated to the interest groups.	SD Values
Alpine - Sustainable Development competencies-oriented	Students gain Sustainable development- oriented skills and knowledge in order to enhance their attitude to live in mountain area Critical skills have to envisage physical mountain related competence and traditional knowledge to guarantee survival in alpine contexts,	ASM set of SD competencies
Setting learner-centered methodologies and outdoor learning	Learners are supported by teachers and non-formal educators in deepening personal relationship to the environment and meanings of overriding actions through learner-centered, ICT based and In teaching are used methods that activate	Strategies, technique, methodologies learner-centered methodologies
Outdoor learning activities	Dealing with outdoor learning experiences	
Transferability and different scales project	Project are shared with similar experiences in other similar geographical contexts at the transnational level, through twinning or digital tools contacts	MOE Best Practices ASM Toolkit
Governance	Schools and non-formal educative system provide to learner possibilities of participative and governance experiences in the ways suitable to their age starting to schools in the neighborhood or in the local community.	ASM governance activities examples

Set your ASM friendly project in 7 steps:

WHO

Formal and non-formal education

Establish stable and effective cooperation with local educational stakeholders

Schools and non-formal organizations should plan consistently

1

WHAT

Alpine Sustainable Development values

Activate the sphere of values

Support learners in assessing their starting values and in comparing them with the Alpine Sustainable Development values suggested in the Alpine School Model

3

2

WHAT

Alpine key Sustainable Development Issues

Analize your local context issues and set project goals

Ensure a thematical interdisciplinary structure based on alpine key Sustainable Development issues

4

WHAT

Alpine Sustainable Development competences

Evaluate what skills and knowledges are required in alpine contexts

Compare with Alpine Sustainable Development Competences suggested by the Alpine School Model

HOW

Cross-curricular perspective

Enhance thematical interconnections in your educational activity

Then, relate it to school subjects and disciplines

5

HOW

Take action!

Get in contact with other projects and educational activities developed within the Alpine School community

7

6

HOW

Methods and strategies

Adopt a learner-centered approach

Integrate outdoor learning activities and techniques

2) ASM first element: Integration between formal and non-formal education actions

ASM aim is at strengthening open and full cooperation among schools and a network of local non-formal subjects in planning and implementation of the ESD-MoE projects and activities.
Possible typologies of non-formal educational organization's implicated in the Alpine School Model activities should be first of all protected areas authorities, that should actively involve and steer the other non-formal education subjects, when and where needed, ensuring that learning experiences should be related to many different areas, from the self to the natural and technical world around us, and from the local to the global level of society.
Other possible actors could be Individual experts or organizations, with pedagogical-didactic expertise such are: scientific and research organizations, mountain rescue associations, museums, mountain guides, farmers, who have various subsidiary activities on their farms, local experts for natural and cultural heritage and representatives of local communities, national forestry office guards, companies and shops, that make/sell local products, souvenirs, tourist association, NGO and associations and finally or regional and local authorities and institutions.

In annex 4 are provided different examples of synergies between schools and non-formal organizations.
Schools institutions can lead the cooperation with non-formal organization or vice-versa are non-formal organizations (especially protected areas) which promote synergies with local schools and coordinate their collaborative experience.
The added value of experts as non-formal educators is a specialized expertise, the familiarity with a particular environment and practical experience that contribute to the interdisciplinary nature of pilot actions, improving organizational efforts and helping raise awareness on key SD issues.
Meetings aimed at organizing the project occur between schools and non-formal organizations in order to set up activities and define basic pedagogical – didactic goals and methods.
Alpine School Model encourages project designed and led by a multiplicity of actors and structured as a cycle of lessons, outdoor activities.

ASM indications can be also provided to structure one-day spot project or short visit of schools at parks, local companies, NGO headquarters, but they are not encouraged since in this way the learning cycle between different functional experiences and complementarity between schools and non-formal competence can be missed.
Non-formal organization should help schools in:

- creating connections with the real world and especially in setting project goals, starting for an accurate overview
- to foster the interdisciplinary nature of the sustainable development contents of the projects,
- experience and development of some skills not otherwise developable in the classroom or at school cognitive, physical, emotional.

Operatively...
Within ASM some suggestions are recommended for the success of the project:

- Non-formal organizations should prepare in advance, at the beginning of the school year, their proposals to be presented to formal education institutions: they're invited to ensure a clear and accessible offer, highlighting the technical contents they will provide during the project running time, referring to ASM pedagogical elements (alpine key SD issues, SD knowledge and skills, learner centered methods), that contribute to the effectiveness of the teaching process, on the basis of the form suggested in Annex 4,
- Non-formal organizations and teachers have joint planning meeting and they cooperate in filling the Unity of Learning form of the project (Annex 6),
- During the school year or during the whole ASM certification process duration time, schools implement the project activities, foreseeing at least two outdoor visits one of which in a protected area; experts are available to teachers for help as following scheme indicates,
- At the end of the school year or at the end of the certification process, schools and non-formal organizations meet to fill the Certification Reporting Form together, in order to evaluate if the original goals were reached.
- It is recommended that schools should create a network of local non-formal organizations with different role and competences in the project.

3) ASM second element: Setting project goals and issues within an interdisciplinary way

The multi-perspective of the project is a requirement to guarantee the complexity asked to a SD project framework. It is however recommended to schools and educational organization to foster the thematical perspective suggested by local context and local community actual situation, in order to strengthen the ability of learners to develop knowledge and skills of their familiar context and the capability to further intervene on it. Schools need to interact with public local authorities who are depositary of different institutional sector strategic plans to gain information about the status of local territory, its trends and the possible action that should be enhanced for the future. When this appears to be a difficult undertaking, several typologies of non-formal organization are often competent and available in supporting schools in focusing on local context, most critical issues and in setting realistic, current and ambitious goals for a sustainable development project.

Another help in the project building process is represented by the authoritatively and internationally recognized UNESCO 17 SDGs[5]. These are a possible working tool to get informed about the aims for a global sustainable development action plan and in drawing alpine school project goals:

Figure 4 – Icons of the UN – Agenda 2030 SDGs

Each of the SDGs are presented in the UNESCO websites within some technical documents which are finalized in the description of the issues and with indicators and target set to be reached until 2030. With the help of the provided materials and tools, each local issue can be related with several SDGs as shown in the figure below as an example, for the Air quality issue.

5 - https://sustainabledevelopment.un.org/sdgs

Figure 5 – Example of Air quality topic relation with the SDGs

Once project goals are defined, teachers and educators should develop their project thematical perspectives, linking them to alpine key SD issues, namely topics related to the sustainable development in an alpine local context.

School systems frequently divide contents in line with different subjects, decreasing the level of interdisciplinarity, fact that doesn't help students in the comprehension of SD issues complexity: non-formal educational organizations are usually more used in providing didactical opportunities voted to naturally booster interdisciplinary programs and this represents an important opportunity for the formal education system. An example to stress interdisciplinary approach in school' management issues is provided by the following diagram:

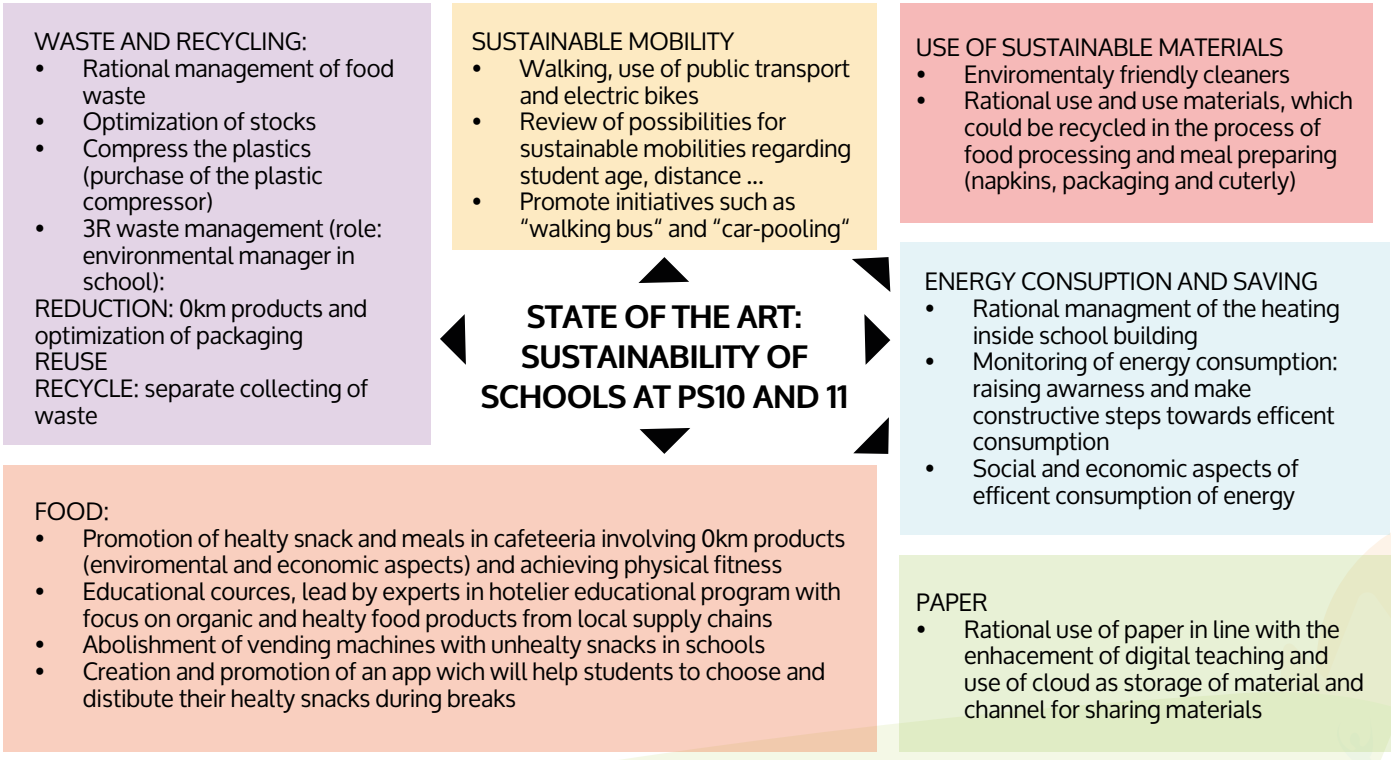


Figure 6 – Example of interdisciplinarity development

ASM aims at stimulating schools and educative organizations in building projects in order to deal with a strategical net of integrated issues related to alpine sustainable development.
In the figure below is provided a complete overview of all alpine key SD related issues within the three main pillars (environmental, socio-economic, governance), the underlying key alpine SD issues such are nature protection, agro-managed landscape conservation, climate change and the related topics and sub-topics.

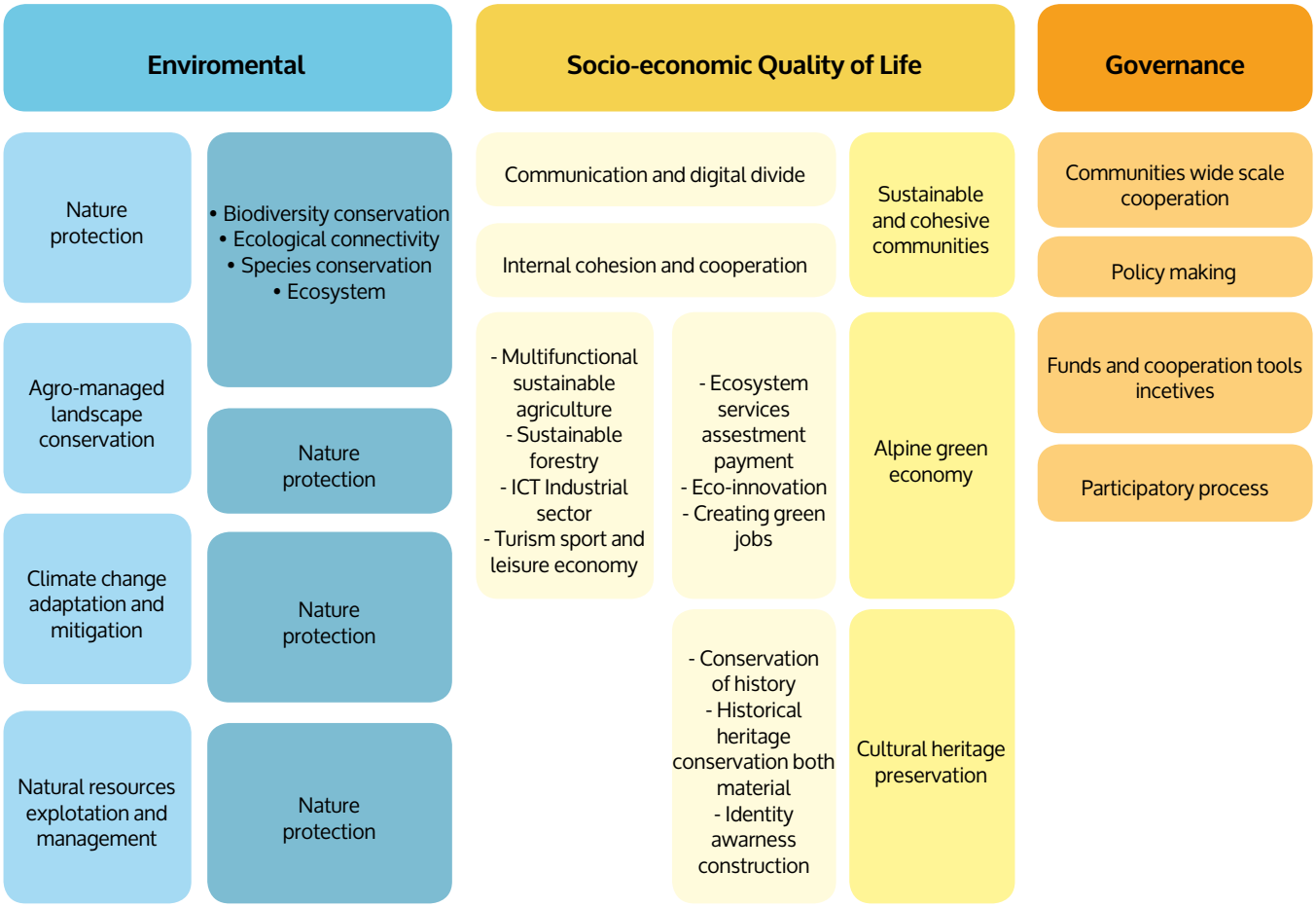


Figure 7 – Scheme of the alpine key SD related issues

Diagrams in the following are detailed for each of the three pillars in key SD alpine issues, in topics, subtopics, their relations and interconnections.
Schools and non-formal educational organizations are solicited in designing their ESD-MoE project, ensuring the representativeness of all three thematical pillars, providing emphasis to at least one of each of the suggested by key SD alpine issues, detailing them in topics and sub-topics.

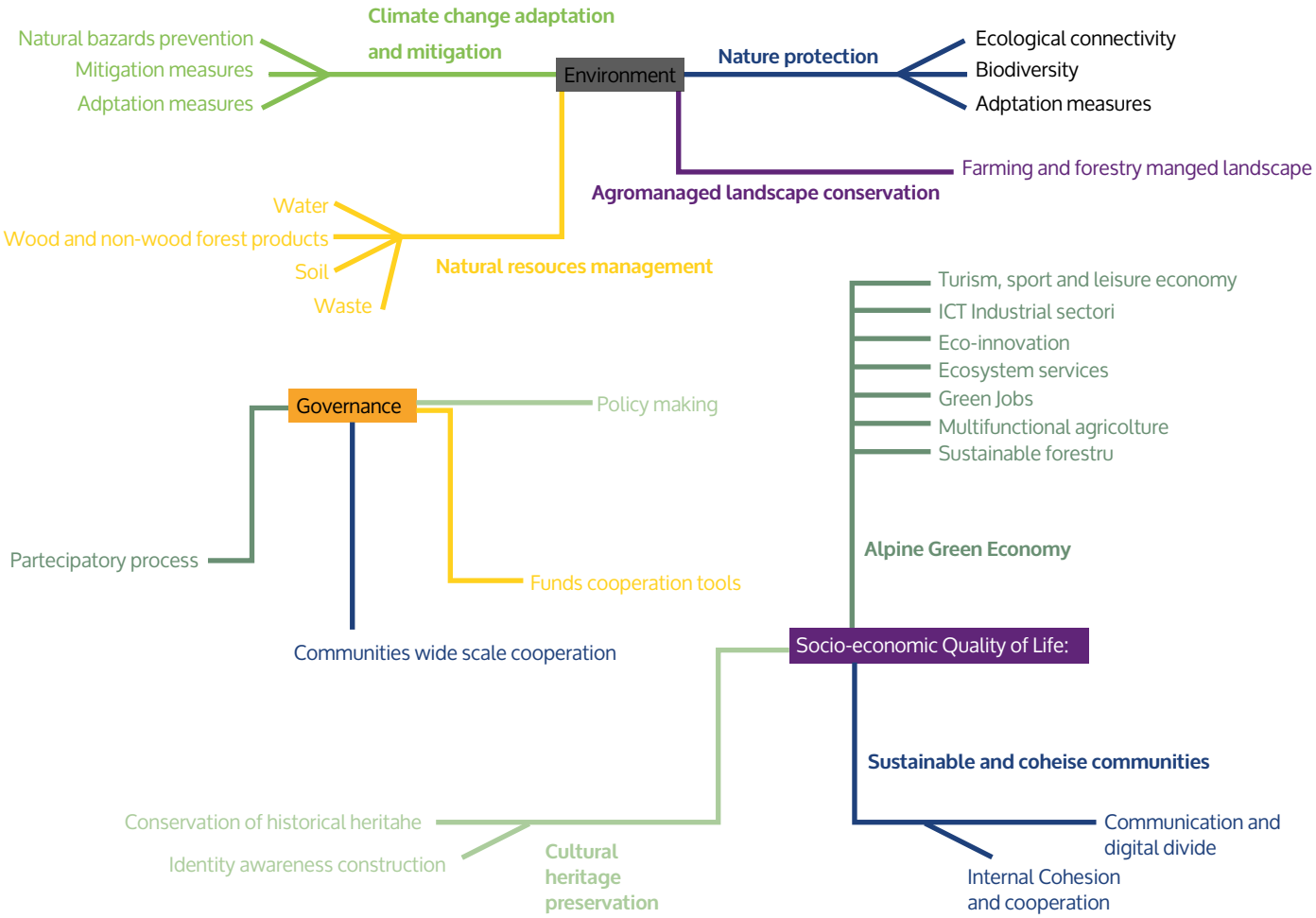


Figure 8 – Conceptual maps on details of the three pillars

Operatively...

Teachers and educators should work with school/class/ group of learners in the creation of educational local tailored project in:

- Setting project goals on the basis of the local action plans, on local community claims and with the help of group of experts from non- formal educational organizations,
- Reference of local most representative issues and project goals to Sustainable Development official international goals also with the help of Annex 1, and elect material and technical documents from international organization correlated to SGDs achieving a number of information.
- Adopt a precise definition and branching of each alpine key SD issue (environment, society, economy, governance) in sub-topics, showing their connection (Annex 1)
- Main school subject teaching activities could be accompanied by complementary secondary activities specifically planned in an inter-disciplinary way

4) ASM third element: Setting didactical contents within cross-curricular approach

Alpine SD key issues complexity and interconnectedness allow learners to increase the demand of required disciplinary knowledge: educators and teachers are called, within Alpine School Model indications, to pay specific attention in improving specific cross-curricular perspective in the formal education system plans.
School system is formally linked to rigid structure and constraints represented by regulations of normative and the school curricula and need to be supported and led to acknowledge and foster cross-curricular experiences.
In the following diagram is provided an example of cross-curricular approach suggested by one pilot site school activity of the project YOUrALPS:

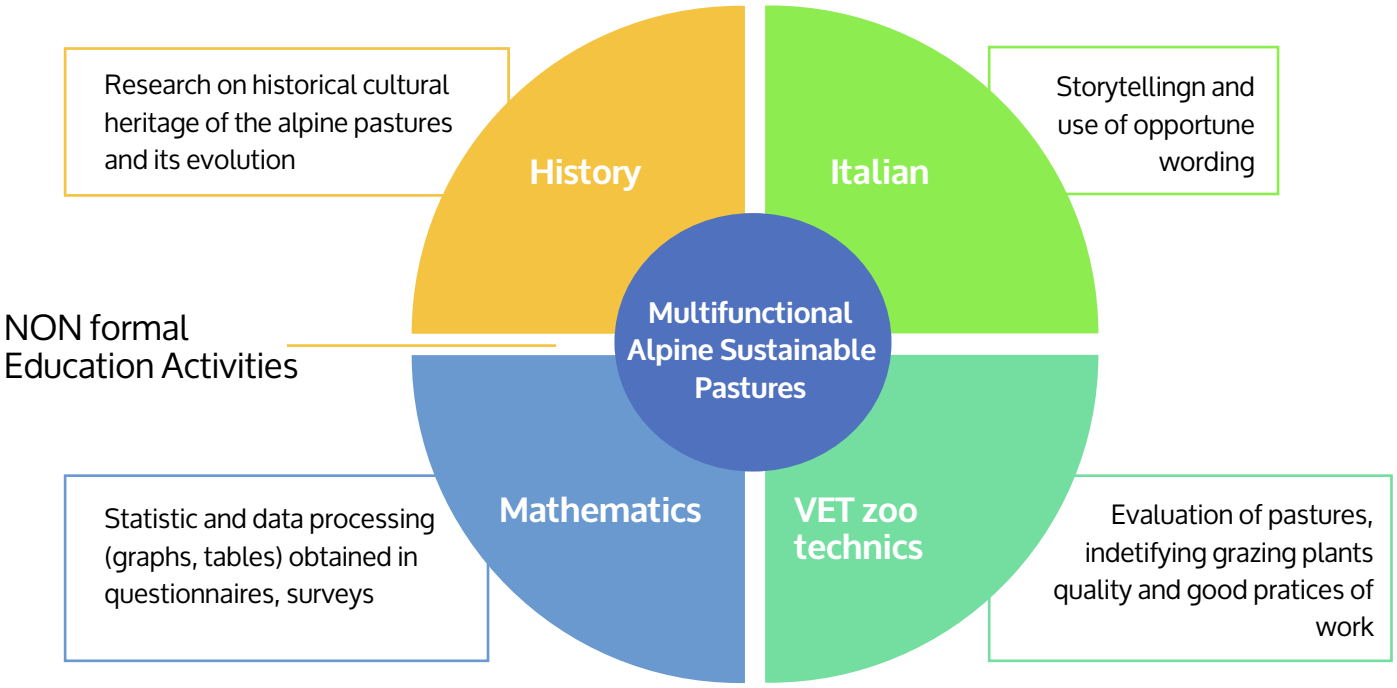


Figure 10 – Example of the cross-curricular development of the alpine key SD issues

Alpine School Model aim is at enhancing cross-curricular approach in the school activities, both in dealing with the alpine key SD issues viewed from different disciplinary perspectives (environment, society, governance), showing their multidimensional character and interconnections and relating the SD issues to basic knowledge of multiple learning areas and contents including those topics in the school basic subjects.

Operatively...
Teachers can find didactic categories for the alpine key SD issues translated in the different school subjects and disciplines in order to develop basic and complex knowledge and to understand how to deal with specific school grades: In Annex 2, relations between SD topics, formal learning areas and school subjects within the specific curricula are presented.
In the process of implementation of the cross-curricular approach, teachers and educators could be facing some problematic issues that need to be handled with precautions. In the following are some possible suggestions:

- School timetable should allow the availability of adequate space and time for combining the work of different subject teachers,
- Cooperation among teachers in schools and among teachers and non-formal educators in project design and planning should be fostered as a routine and school work style,
- Examples of good practices of cross-curricular approach should be disseminated in order to promote motivation among teachers and non-formal educators,

5) ASM fourth element: How to deal with values in educational activities?

Education means handling with human person's integrity and complexity (feelings, values, beliefs, visions, expectations). All these factors have to be accounted for an effective educational planning.
The first of ASM criteria attains at the clarification of possible sustainable development values underlying educational activities. Recognize the importance of values and which values we wish to support through educational work is the first important step acknowledged by the ASM.
This task goes far beyond the work of institutions that have simply goals to fulfill (e.g. the SDGs): hence, educational organizations have to enhance knowledge, skills and behavior in order to allow individuals and communities to be actors in the achievement of SDGs and to prepare and train towards SD goals and actions.
It is therefore important to broaden the common meaning of value as indicators of economic value, including in its cognitive elements, functional aspects and social and ethical values.
Values, in particular, represent our guiding principles, our broadest motivations, influencing the attitudes we hold and how we act (Holmes et al. 2011).
Values are the way to promote individual learning and the key to enhance a positive shift toward behaviors: understanding is just the first step and not enough to motivate meaningful positive changes in attitudes and behavior, as shown in the diagram below.

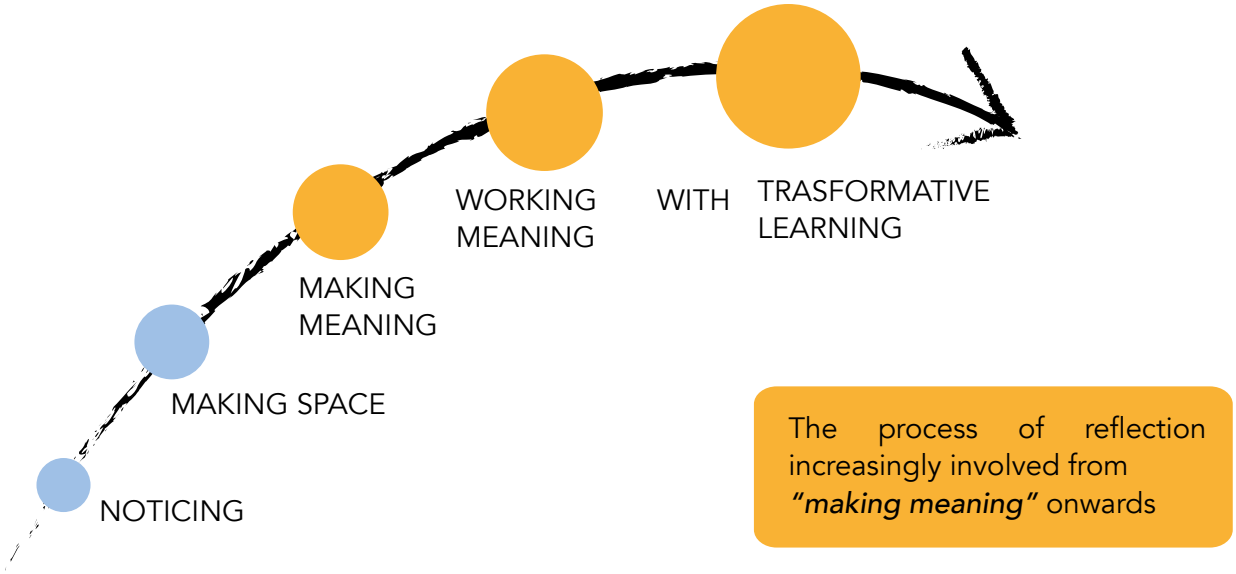


Figure 11 – Deep learning continuun (Modified from Moon, 2004)

Socio-psychologist researcher's team (Schwarz, 2011) who investigates how values are represented in the humankind and how they work, found that acquiring knowledge and understanding about sustainable development it isn't transformative and doesn't change the motivation and the final behavior of learners. Contrary, fostering the development of certain groups of values can lead to higher levels of positive environmental and social thinking and action.

In the following map, proposed by Schwarz in 2011, are overviewed main human values. It is important to highlight that relations between different values do exist: values contiguity in the diagram represents their logical closeness. Values underlying sustainable development purposes are the ones which support:

- Cohesive and cooperative communities: (Benevolence, security, conformity, Universalism, equality, helpful, self-discipline)
- Preservation of traditional heritage: (Tradition, wisdom, security)
- Protection of natural landscapes and cycles: (protection of nature, security)
- Sustainable economy, innovation and social-entrepreneurship: (achievement, power, universalism)

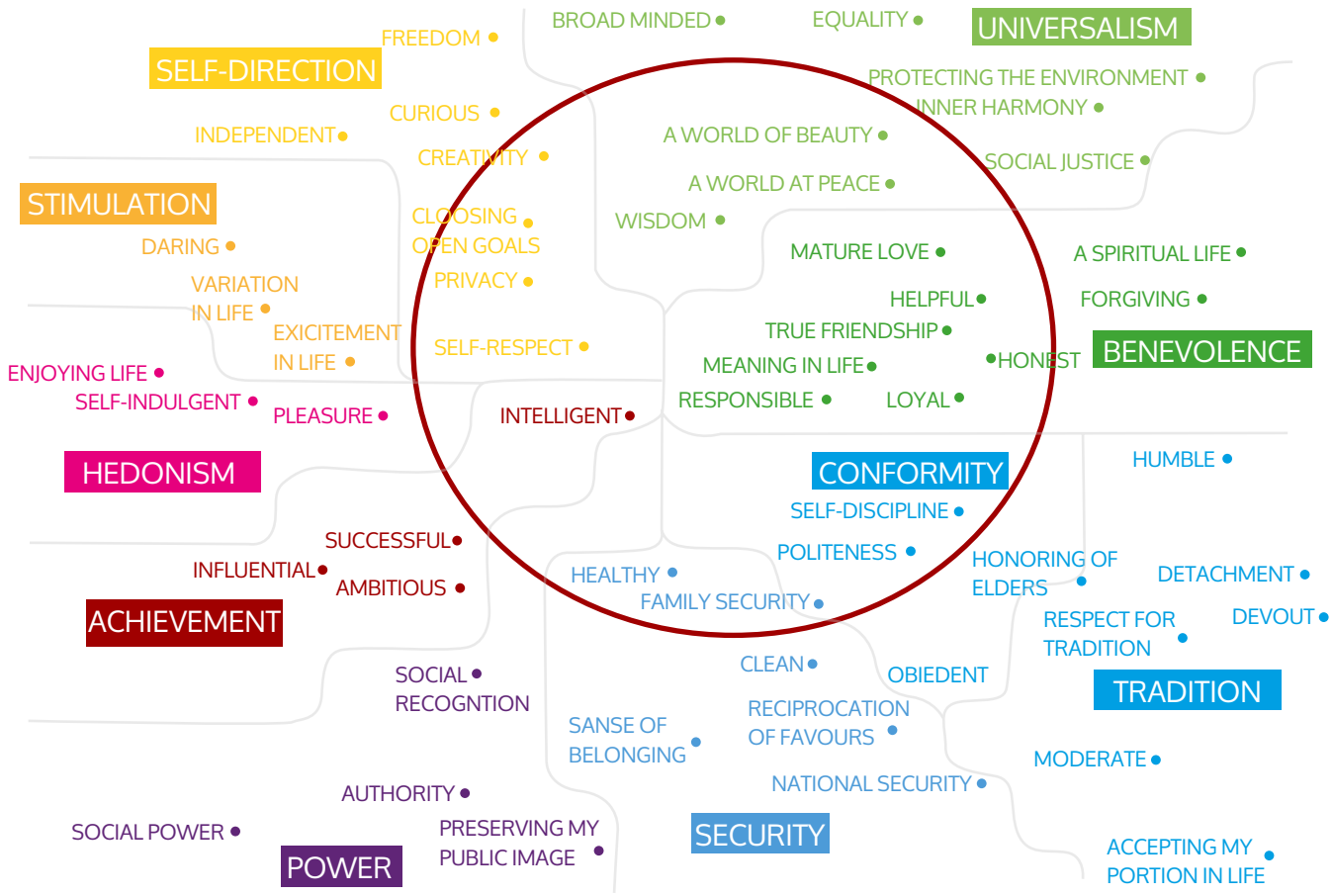


Figure 12 – Map of humankind values (Schwarz et al., 2011 – from Real World learning scheme)

Values and attitudes:

- Sense of identity and self-esteem
- Empathy
- Commitment to social justice and equity
- Value and respect for diversity
- Concern for the environment and commitment to sustainable development
- The belief that people can make a difference.

(Adapted from Oxfam, 1998, p. 3)

Operatively...

Teachers and educators should assist class/groups of learners in clarifying their starting values and how to undertake a process of sharing ultimate means and values for their ESD-MoE project. In the following are presented some suggestions in order to engage in this work.

The group of learners/ class has first to deconstruct their socialized values, challenging them to become actively conscious of values which have been inherited, chosen and/or socially embedded (UNECE 2010), the personal bias developing an ability to understand how background, culture and values interact to shape our knowledge and perceptions and those of others (UNESCO 2002).

When combined with critical reflective thinking skill this exercise provides a powerful tool for understanding and making decisions in relation to personal and collective responses for sustainability and seeing the links between lifestyles, consumption and sustainability (Balzaretti-Hyem 2002).

The reflection can proceed in evaluating opportunities for understanding cultural values and how these are challenged by globalization and modernization engages the learner in clarifying (and often reconstructing) a value-based thinking and acting which influence sustainable development (PCE 2004).

Finally, it would be helpful understanding the values held by others: providing a basis for exploring social identities as well as cultural diversity. It helps to identify often unconscious or unarticulated values which can promote or stifle dialogue or engagement towards sustainable development (Tilbury and Wortman 2004).

- it is suggested to outline the class/group of learner map of individual and shared values
- to a class/group of learners can be proposed a discussion on what values could be needed from our local community and context.

6) ASM fifth element: Setting competences and skills and their assessment

Our culture lost a natural way of thinking about the environment which surrounds us and the mountain area often are particularly affected by climate change and depopulation: the consequences of that loss are unsustainable practices. Youth equipped with knowledge and skills useful for alpine sustainable development will acknowledge of natural and cultural heritage values and preservation and will remedy this existing gap.

Therefor it is important to give to younger tools to understand their environment: knowledge and skills allow them to devise sustainable living way into their communities.

Students learn frequently about key sustainable issues as possible solutions and frequently react in line with SD competences, but not consciously. It is important that students become aware of SD contents and competences and internalize them: empowerment means that learners recognize and realize their own ability to act for positive change in a competent way.
ASM indications soliciting the acquisition of transversal SD competencies, skills and knowledges.
How to plan lessons and activities in articulating skills, knowledge and attitudes and integrating SD non-formal competences?
A wide debate raised at international level, mainly inside the academic institutions, is drawing attention on how to integrate, in the formal education planning, competencies provided by non-formal context and life experiences such are some of the SD competencies which refer to the UNESCO proposal.

Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.

Anticipatory competency: the abilities to understand and evaluate multiple futures possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.

Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.

Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.

Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.

Critical thinking competency: the ability to question norms, practices and opinions; to reflect on own one's values, perceptions and actions; and to take a position in the sustainability discourse.

Self-awareness competency: the ability to reflect on one's own role in the local community and (global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.

Integrated problem-solving competency: the overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development, integrating the abovementioned competences.

Table 2 – Sustainable development competences frame (from Learning objectives -Unesco 2017)

European key Competencies
Communicating in a mother tongue: the ability to express and interpret concepts, thoughts, feelings, facts and opinions both orally and in writing
Communicating in a foreign language: as above, but includes mediation skills and intercultural understanding
Mathematical, scientific and technological competence: sound mastery of numeracy, an understanding of the natural world and an the ability to apply knowledge and technology to perceived human needs
Digital competence: confident and critical use of information and communications technology for work, leisure and communication
Learning to learn: the ability to effectively manage one's own learning, either individually or in groups
Social and civic competences: the 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
The sense of initiative and entrepreneurship: the ability to turn ideas into action through creativity, innovation and risk-taking as well as the ability to plan and manage projects
Cultural awareness and expression: the 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

Table 3 - European framework "Key competences for lifelong learning" (EU 2006)

Curricula and formal teaching planning are limited by constraints and regulations set by the European framework of "Key competencies for lifelong learning" (2006) which entails the formal competences for the National Guidelines for school curricula. In the following table are outlined the European framework of "Key competencies for lifelong learning" (2006).

Operatively...
SD competencies can anyway be introduced in the lessons and activities planning according to SD knowledge, skills and attitudes schemes and connected to formal competencies, using the flexibility provided by your present national curricular planning, in using the enclosed schemes.
The Alpine School Model help schools and non-formal organizations in SD competences planning by offering operational support within the description of Sustainable Development competence, Splitting of SD competence in general and subject-related skills and knowledge.
An important indication highlighted by the Alpine School Model is at inviting in the same way non-formal organizations in planning and outlining learning settings for their activities on the basis of the same SD skills and knowledge suggested for the formal educational planning in schools.
In this way, schools and non-formal educational organizations will have a common language in sharing project planning goals and more easily evaluate project performances. To Non-formal organizations is asked to provide their project offers in respecting the same structure proposed to schools, in making explicit SD Competence.
In Annex 6 teachers and non-formal educators can find some tips for the evaluation of the acquired SD competences during the projects or the educational activities.

SD Competencies							
Competencies	Anticipatory	Normative	Strategic	Collaboration	Systems Thinking	Self Awareness	Integrated Problem - Solving
Knowledge → Learners know	• Information and data about plausible local area future multiple scenarios– possible, probable and desirable • Analysis approaches • Timescales relevant to the problem and possible solutions • how to evaluate possible impacts	• Concepts of justice, equity, social–ecological integrity, Ethics • UE, national and region al regulations • funds resources and opportunities for development	• concepts and methods for strategy building • viability, feasibility, efficiency, and efficacy of systemic interventions, and the potential of those interventions to produce unintended consequences	• how to use Communication tools • How to use participative and cooperative methods - functional values regulating social cohesion in local communities	• alpine key sustainability issues, their causes and consequences • actions, interests and mandates of key stakeholders in the problem constellation	• different role for Sustainable development in the local community and global society	• different problem-solving frameworks related to sustainability • inclusive and equitable solution options • ICT and Technologies to foster Sustainable Development
Skills → Learners are able to	create one's own visions for the future: • structure uncertain information about the future into plausible future multiple scenarios– possible, probable and desirable; • apply the precautionary principle • possibly previously evaluate the consequences of actions and how to prevent undesirable ones	• gradually recognize the meaning and applicate norms and values underlying actions, • negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interest uncertain knowledge and contradictions.	• use learner-centered methods for designing, implementing and adapting SD actions in the local communities, and to deal with risks and changes.	• collaborate with others and learn from others • understand and respect the needs, perspectives and actions of others (empathy); • understand diversity especially those related to cultural and social aspects	• recognize and understand relationships in complex systems • analyze how systems are embedded within different domains and different scales	• reflect on its own values and personal bias • be aware in its own role in the local community and society • evaluate and further motivate actions feelings and desires	• think about a problem critically • apply problem-solving approaches and develop viable, equitable solutions • facilitate collaborative and participatory approach and to deal with conflicts in a group; • adapt Physical skills to mountain performance requirements (sport and leisure)
Attitudes →	• Accept the responsibility of actions and choices done	• Be open to other opinions	• Be committed to integrity and ethics. • Be open to varying perspectives. • Be willing to act despite inconclusive or incomplete information	• Embrace diversity among cultures and social groups	• Think Global act Local	• Be active in the environment • Deal with one's feelings and desires	• Be open to varying perspectives

Table 4- Detail of the SD competences structure (knowledge, skills, attitude) – Adaptation of G.Silvius by FLA

7) ASM sixth element: Setting learning environments-strategies, methods and techniques

"...Connectivity has become increasingly important to all aspects of societal and individual life, with mobile technology playing a growing role. While schools were once the only place students could get access to ICT, today in a growing number of countries mobile devices and home Internet access have helped enable young people to be heavy ICT users. Most education systems have to better exploit this situation and its potential for learning by paying attention to the many innovative ways learners benefit from ICT for communication, learning and knowledge sharing."

The fourth of ASM criteria is oriented in soliciting the adoption of adequate methodologies and strategies that favor the acquisition of previously indicated SD Knowledge and skills.
Educational interventions, in order to integrally allow the acquisition of SD competences, need integration with physical, emotional and mental dimensions. This is how, within ASM indications, it is suggested to adopt, in the teaching and educational process, the employ of integrated methods and techniques under the utilization of a learner-centered and cooperative approaches and strategies.
In the following frames and examples of some approaches and methods are reminded.

Teaching methodologies should be learner-centered

A very important principle which underlies the ASM approach Is that education is for everyone, but the way we deliver education—and the way students receive it—is not the same for everyone. For this motivation ASM reflection is oriented to provide learner-centered strategies.
These approaches, using a variety of methods, reveal something new to the learners, raising the sense of curiosity and sensitivity: the motivation of learning comes from the curiosity of knowing about the world around. Methods suggested in the following provide a good chance to exercise with their surrounding reality, are flexible to meet in multiple ways the needs of learners, flexible and applicable to different contexts from school institutions to non-formal context included outdoor experiences.
Most of SD skills are very complex to be acquired and in this way they requires the use and application of different techniques and tools: today's students are digital natives and they can achieve learning goals by using new technologies and doing field experiences complementarily, this in according to UNESCO Education Strategy: UNESCO is committed in promoting the adoption of ICT in education solutions which will facilitate knowledge dissemination, more effective learning and the development of more efficient education services, as well as the reconceptualization of teaching and learning processes. The Organization is convinced that ICT-based solutions if driven by pedagogy, can make a major contribution to basic education for hard-to-reach, marginalized groups by increasing access and quality, reducing inequality (particularly with regard to girls and women) and promoting the creation, sharing and adaptation of good quality educational resources ...].
In the following boxes presentation of EBL, EAS, Flipped Classroom and Cooperative Learning are provided and, in Annex 3, tools for application of the above-mentioned methodologies are presented.

Operatively...
Teachers and non-formal educators should choose and implement suggested learner-centered methodologies and outdoor activities mixing cognitive, emotional and physical methods in order

Enquiry-Based Learning (EBL)
EAS

School should be the major environment forming a more resilient future society and the place where to implant ideas able to make the difference from the past, where we might have the chance to find solutions for the sustainability of future generations. It should take the role of social responsibility in the critical use of natural resources and promote accurate information on natural hazards. And all this can become an interesting research and discovery for students through an EAS, in Italian it means: "Episodi di Apprendimento Situato" (Episodes of Situated Learning). EAS have the potential to actively engage today's students and therefore can be successfully used to promote knowledge on fundamental issues that affect future generations. As such, the method is based on active learning strategies and relate to the three learning domains referred to as knowledge, skills, and attitudes. They are based on a flipped-up approach to learning that starts from research on a certain subject, acts on problem-solving abilities, encourages a classroom discussion engaging students in solving problems in a learning-by-doing framework, and ends with a reflective learning approach, where concepts are reworked and restructured. Research is done through digital media, which is more suitable to students. The execution time is short, maximum one month for single activity included in a project.

The first step, before the lesson, is to prepare the activity that with our kind of homework is going to give to the classroom: its aim is to make possible that EAS we're going to imagine the students could do. The teacher has to choose which students could manage information about what they're going to learn through the activity planned by the teacher for Step 2. After this, the teacher prepares the conceptual framework he's going to present to the classroom. Student, at home, do their homework and so they start to think about what it will be the object of their activity in the classroom. It could be interesting to realize this first step during a field trip and so doing teacher, involving the stakeholders, could create a real "situated learning", supporting environmental educational process via interconnected formal and non- formal education.

Step 2- Teacher starts the lesson presenting, in a few minutes, the conceptual framework to the students: a principle, an idea, some highlights emerged during the trip he/she considers could be useful for students better learn. After this he gives an input (a video, a problem, a text, etc.) to the classroom and, starting from this, asks students to make a challenging activity. Students are usually asked to build up a product: a movie, a storytelling, a text, a problem solution, etc. The teacher manages the activities and provides students with scaffolding.

Step 3 - After students have finished their activity, teacher asks to some of them to present his/her work to the classroom. Everyone can make observations and each of them is discussing with each of the other ones about results and possible solutions. While students discuss all together, teacher is observing them, assessing their performances and products. Finally he/she makes his/her lesson: individualizing misconceptions and defining the concepts that thanks to the EAS was possible to meet.

Flipped Classroom for classroom activities and more

The flipped classroom is a pedagogical model in which the typical lecture and homework elements of a course are reversed. Short video lectures are viewed by students at home before the class session, while in-class time is devoted to exercises, projects, or discussions. The video lecture is often seen as the key ingredient in the flipped approach, such lectures being either created by the instructor and posted online or selected from an online repository. It could be possible to engage the students with other materials outside of class, for example collected during a field trip, to prepare for an active learning experience in the classroom.

Flipped classroom could be:

- An opportunity for students to gain some exposure to the course content prior to class. Depending on how the model is implemented, the exposure can either be high-tech (videos, online) or simply pre-class reading assignments.
- An incentive for students to prepare for class. Students are encouraged to come to class prepared and earn points toward their grades by completing pre-class assignments, such as quizzes (ideal for online components) or writing assignments on worksheets.
- A mechanism to assess student understanding. The pre-class assignments that students complete as evidence of their preparation can help both the instructor and the students assess whether they understand the content.
- In-class activities that focus on higher-level cognitive activities. If the students gain basic knowledge outside of class, then they need to spend class time acquiring deeper learning and improving their skills

Flipped learning is not about how to use videos in lessons. It's about how to best use in-class time with students. That insight is causing educators in classrooms from kindergarten to college to reevaluate how they teach.

At first teacher has to find a concept to flip, in a second moment he has to incentivize out of class work with formative and summative assessments and at the end has to privilege activities that allow students to practice applying the concept during the class time.

Cooperative learning

The psychology perspective in studying education has moved the focus from the individuals' learning to learning in groups. Individuals solve problems by communication with each other in a group. Cooperative learning is getting more and more popular in many areas of our life, especially in education and working. Johnson and Johnson et al. (1975) defines cooperative learning as "the instructional use of small groups so that students work together to maximize their own and each other's learning". All the methods used in cooperative learning share this idea that students learn together so that they create a better learning for themselves and others. However, each cooperative learning method has its own components and focus. Collaborative learning is also defined as learning together in a team and helping each other. The method Student Team learning developed by Johns Hopkins University is the main part of cooperative learning. It is one of the cooperative learning methods but

Cooperative learning is an instructional method in which students work together in small, heterogeneous groups to complete a problem, project, or other instructional goal, while teachers act as guides or facilitators. This method works to reinforce a student's own learning as well as the learning of his or her fellow group members.

According to James A. Duplass, the following are the most commonly found characteristics of cooperative learning:

- Teacher supervision—the teacher should always monitor group activity to ensure that students are not veering too far off task. The teacher should also be available to answer student questions and guide discussion if necessary.
- Heterogeneous groups—the teacher creates groups of diverse ability levels and backgrounds.
- Positive interdependence—by setting group goals and working towards a reward or final learning outcome.
- Face-to-face interaction—students are encouraged to use verbal and nonverbal communication to solve problems and explain learning material.
- Individual accountability—students are accountable for their tasks and for assisting the whole group meets learning goals. This accountability is enforced through student roles.
- Social skills—the teacher needs to establish rules so that all students are respectful, speak in a manner appropriate to the classroom setting, and utilize their time wisely during group interaction.

Cooperative learning changes students' and teachers' roles in classrooms. The ownership of teaching and learning is shared by groups of students and is no longer the sole responsibility of the teacher. The authority of setting goals, assessing learning, and facilitating learning is shared by all.

When beginning to use cooperative learning with students, it is also important to establish team norms. Team norms are guidelines or rules governing how group members agree to work together.

Students should be grouped for instruction to maximize opportunities to learn, and the type of grouping can produce different results based on the circumstances. Establish groups using a variety of criteria, such as academic skills, student interests, and instructional objectives.

Once groups have been determined, the most important phase begins. Instruction should be based on solid content, with grouping used to enhance and customize student learning. Students should understand the objectives, instructional tasks, and criteria for success.

After instruction, assessments may include paper and pencil achievement tests and/or measures of actual student performance or group products. Develop a way to assess both group and individual accountability. After working in groups, students should engage in group processing activities where they discuss the interpersonal skills that influence their effectiveness in working together.

Games represent an important strategy to acquire knowledge in a learner-centered way, because students are more likely to get interested in and focused on issues in a playful way. Activities may adopt games cards, game box, or digital games suggested in Chapter 5. Games can be also teaching techniques and can be represented from the following example.

The class can play a role game in which students interpret different stakeholders involved in management of protected area, tasks and resources. The game consists of a discussion in order to achieve common decision regarding different issues (i.e. forest management future, governance of river restoration, policies for land use etc.). Through arguments adoption, the learner will experience the importance of fair negotiation for the community well-being and the existence of eligible different points of view.

Outdoor education activities

According to SD competence approach, learning is a process of personal integral development that links to the cognitive, physical and emotional level. Teaching methods can be, in their application, focused mainly on one of these levels but have ultimately to abridge all other dimensions.
Outdoor education activities can benefit from learner-centered methods and strategies previously introduced and integrate all human dimensions: educational activities need the media of body, movement and adventure to get involved in natural spaces. In outdoor experiences, well prepared in school cross-curricular classes, developed also in an interdisciplinary way within the non-formal organization cooperation, learners would have all the information and resources useful to improve their knowledge and connect it in an integral way with the emotional, cognitive and physical aspects during their educational paths.
A kinesthetic element with the medium of the body, enjoying physical movement and the group's practical activities, benefit the development of the brain and sensory systems. Today students' physical education is decreasing and new generation youth are more focused on abstract and unreal aspects in their daily experience, without educational physical activities, besides sports performances.
Working on senses, exploration and adventure activities, sense of the challenge, the risk and the scouting of possible solution of survival plus the emphasis on emotional and psychological aspects, are ways to possibly reach the development of collaborative and self-awareness competences.
Physical skills needed to ensure the daily life in mountain areas need adequate training and exercise in order to achieve the needed level of performance both for professional and private life. Special training projects in mountain physical skills as mountain hiking and skiing, orienteering will be encouraged through the ASM educational suggestions and indications, promoting every year a-week residential class to allow every student to acquire adequate increasing competences.

Methods which emphasize the affective dimensions are the core element of learning: there are evidence from scientific studies that contact with nature brings to more balanced emotional feelings. According to the Theory of Biophilia (Wilson, 1984), we have an innate emotional affiliation with other living organisms and that we are evolutionarily predisposed to feel happy and function more effectively in a natural environment. Emotion-based learning, guided discovery, visual imagery, storytelling also digital, scenarios and case study held in natural context can better lead to obtaining self-awareness competence and personal development.

Storytelling can be used in any setting, having the potential to engage a reflective mood and help to understand and make sense of our own narrative. The story may be personal, contemporary or archetypal, depending on the context.
The use of ritual can be used to mark transitions and boundaries between reflective time and action time: might be as simple as lighting a candle, reading a poem, stressing the passage of seasons, or of the different moments of the day.
Artwork in nature or the use of photography are very effective activities to develop emotional work, using in the same time senses, emotional ways and physical skills.
Through lenses, they actively observe the natural or cultural heritage of alpine space – when they observe together a scene, they share a different perspective of a scene. Therefor their senses are awake and they are motivated for learning about the object of observation.
Some example of activities that are matching several elements with the use of photography, cooperative learning and a game approach is the following in the box.

Nature-based mapping coupled with orienteering activity is an extraordinary way to encourage the exploration of natural contexts.

An interesting activity matches map interpretation or map creation with the exploration of the area, collecting natural elements found in the field research: students receive maps of territory with marked interest points, but they explore the area by their own interests. In the exploring process, they employ tools for easier observation (binoculars, magnifying glass, historical documents). They also start to collect some materials, needed for the preparation of the digital path (photos, videos, interviews, track sounds, ...).

An interesting way of reporting is to Building a 3D model of their path students create 3D models of their path from different materials based on their exploring on site and prepared materials.

1 / Playful reading of the mountain landscape

This activity allows participants to discover the landscape by themselves (observations, emotions, hypotheses, ...) to better understand the technical information that can be provided by a specialist.

Place yourself on an open site that suits well (ideally with a view of several levels of vegetation). Some activities: Each participant writes 10 adjectives of his feelings in front of the landscape. Each participant counts the colors and then counts the sounds. Each participant draws the landscape in only 10 lines (this allows to clear the large sets of the landscape). A participant chooses an element of the landscape and the group must guess it by asking questions (answer yes/no). Each participant draws the landscape as he would see it in 50 years. After each activity, there is a sharing time with the group. These activities can be gathered on a form to be completed by the participants.

2 / Photo-language on the mountain

On a table, a selection of photos and/or images are presented on the mountain (or on an element of the mountain: snow, pasture, etc.). They can be pleasant, funny, unpleasant, shocking, etc. The participants choose a photo and everyone then explains what motivated their choice. The goal is to bring out initial representations on a theme. This is useful for initiating a dynamic on a theme or for measuring the state of knowledge of a group at the beginning of a project or an exit The photo language can also be used to measure achievements after a pedagogical activity (with 'right' or 'wrong' pictures).

In order to ensure the increase of knowledge, also according to the experiential approach suggested by ASM, laboratory work on field measurements, collecting data, their analysis and presentation are activities strictly required by ASM. Naturalistic observations on field coupled with laboratory activities are suggested, as an example:
Observation and analysis of benthic macroinvertebrates to determine the water quality of the alpine stream

Collecting seeds of crops and vegetables from elderly people and try to make a seed bank: For the purposes of the subsequent presentation, they made a model of the terrain where they worked and placed points with QR codes on it, where they presented the natural and cultural heritage of the area.
Making cosmetics from natural ingredients (alpine flowers could be useful) and define their attributes. It could be their business idea.

8) ASM seventh element: Improve governance potential - take an action!

The United Nations Convention on the Rights of the Child (UNCRC) states that "Youths are not merely passive recipients, rather, they are subjects of rights who are entitled to be involved, in accordance with their evolving capacities, in decisions that affect them, and are entitled to exercise growing responsibility for decisions they are competent to make for themselves".
Positive emotions play a big part in learning and transferring complex knowledge and skills, anchoring them into real daily life of students, enhancing the capacity of promoting change. Once understood a problem, learners could translate them in adapting their thoughts, emotions, knowledge, actions and physical being of the individual person. ASM indications are intended to encourage an active transfer of the acquired knowledge and skills to the learner's own life and community.

All the acquired knowledge and skills can help in performing positive and concrete actions for sustainability. The fall out of our choices and activities on economic, political, cultural and social dimensions start in the communities and smaller, local society which are the places where learner themselves are living with their families, friends and neighbors. On this level young citizens have the best chance to take actions for sustainable development.
An active engagement can be experienced by youth both in participating in the decision-making processes or conversely in implementing concrete actions. These two approaches can follow different steps and require to learner different skills.

The participation of youth in decision-making processes can inspire innovative government policies, encouraging them to articulate their concerns and in contributing to build peaceful and democratic societies.

In engaging an active path on participation to shape local or global governance with their advice advices, youth learners should first of all acknowledge the level of suitable options, in terms of normative availabilities which recognize the right of citizen to express their opinion, and the opportunity represented by decision makers openness and interest in welcoming their contributions (Shier, H. 2001). According to the study is important to understand which one of the participation five levels is involved in the launched process:

1. Youth can be listened?
2. Youth can be supported in expressing their views?
3. Youth views can be taken-into account?
4. Youth can be involved in the decision-making process?

Other possible paths relate to the concrete engagement that can introduce young people to safe and accessible mechanisms for challenging key strategies, in taking informed decisions on real life sustainability issues or in working together actively and in involving their communities in collaborative solutions, to examine their assumptions, knowledge, and experiences, in order to develop critical thinking, and to be open to change, or to be aware of cultural practices as an integral part of sustainability issues.

Operatively...

n building a participative path for youth is to be informed about project practices running in the Alpine space territories. Teachers and non-formal organizations are, for example, invited to find out how other alpine similar contexts and local situations area are treating alpine key SD issues. Awareness on projects and educational experiences going on should encourage the promotion of twinning projects with schools and non-formal organizations located in other alpine areas. An operational support is offered through the ASM Toolkit – AlpsApp, which offers, in the governance section, resources which provides information about educational opportunities, natural and cultural heritage resources, on the websites and with the use of toolkit (See chapter V.).

Within AlpsApp functions users will be able to provide comments on activities done, on places in the Alps they visited and giving information about cultural heritage, traditions, sustainable communities and Alpine green economy, through uploading pictures and small texts or emoticons of their educational activity. In this way we would encourage story telling on the experiences and discovers they did and the App should become a sort of digital Atlas of educational opportunities and practices.

Participative approach can be experienced within the use of role games in which learners could simulate real conditions and test their acquired skills in a protected way. In the Toolkit Chapter (n.5) are presented several examples of the role games with different aims and tasks.
In order to promote the active transposition in real life, learner could also be invited in experiencing school-oriented "governance" tasks, in relation to their age, such could be the following:

- Primary school= change individual and familiar daily life, small groups of friends
- Secondary 1 grade = actions in school and community situated occasions (local decision makers institution)
- Secondary 2 grade= actions in community either within school or private initiatives (policy makers, local communities, global community)
- VET = Green jobs professional life

3. Alpine School Model examples

1) Plan of contents

Educational activities based on indications on ASM, experienced by schools and non-formal educational organizations involved in the project YOUrALPS are provided as examples on how the pedagogical framework operative sections should be interpreted and applied in an accessible way. The examples were elaborated in the way to be presented as clear articulation of ASM framework.

Examples differentiate on the basis of thematical issues reference referring to the key SD alpine issue selected and presented in previous paragraph of the ASM: for each of the main key SD alpine issues an example was adopted.

1. Let's go to find the alpine plants on mountain pasture Vogar - PS14

ASM Pillar: Environmental
Macro-issues: Nature protection
Key alpine SD Issue: Diversity of species, ecosystems and habitats

Let's go to find the alpine plants on mountain pasture Vogar

Photo gallery






FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo
- Triglav National Park

SD VALUES

- Universalism: To protect the environment;
- Benevolence: To be responsible;
- Tradition: To be moderate;
- Security: Healthy lifestyle.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Gain knowledge about alpine plants regarding their biodiversity, adaptations to alpine climate, habitats
- Recognize and identifies endangered species of alpine plants
- Is familiarized with legislation concerning the protected area of TNP and protection of plants
- Understand the principles of sustainable exploitation of natural resources (alpine plants, grazing on and mowing of the lower and higher alpine meadows)
- Can anticipate the negative consequences of excessive exploitation of natural resources (alpine plants)
- To plan, prepare, execute and control your own work
- Connecting theory with practice and to think interdisciplinary
- To collaborate with classmates in the field
- Develop sense and values for nature, environment, and natural features
- To train communication and presentation skills

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Timescales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility of actions and choices done;
- Normative: Gradually recognize the meaning and applicate norms and values underlying actions;
- Strategic: use learner-centred methods for designing, implementing and adapting SD actions in the local communities
- Collaboration: Collaborate with others and learn from others; understand and respect the needs, perspectives and actions of others (empathy)
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; actions, interests and mandates of key stakeholders in the problem constellation
- Self-Awareness: Evaluate and further motivate actions, feelings and desires; Be active in environment;

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods Materials Location Time for activity

1. Gaining knowledge about alpine plants, ecosystems and legislature VET module Frontal lecture from the TNP expert in the classroom PowerPoint presentation, self-notes B C Naklo 3 h
2. Making of identification cards for selected alpine plants Individual work, working with sources Scientific information on www, scientific botanical book and identification keys, computer, notes BC Naklo or at home 3 h
3. Trip and field work on Vogar Learning by doing, observe the plants with different senses and photo hunting, identification of typical alpine plants by using photo identification keys Notes, identification keys for alpine plants Vogar, Bohinj 8 h in total
4. Presentation of selected alpine plants in the field Peer to peer learning Identity cards for selected alpine plants Vogar, Bohinj 5-10 min

Activity description

Students of the VET Module Protection of natural values and biodiversity were learning about the protected areas, natural values and protected species of plants and animals throughout the school year. During the pilot action, they paid special attention to the Alpine world. First part of pilot action was carried out in the classroom with extensive lecture given by the expert from Triglav National Park (TNP), where students learnt about phytogeography, Alpine climate and ecosystems, altitudinal zonation of vegetation, adaptations of Alpine plants (morphological and physiological), nature conservation and environmental legislation in Slovenia through time, effects of anthropogenic activities (mountaineering, paragliding, livestock grazing, forestry), opportunities and threats, and the role of education, supervision, and sanctions. The second part of the pilot action was fieldwork on mountain pasture Vogar. Before the actual fieldwork, students got the list of the selected Alpine plants and had to prepare identity cards for each plant that included Slovenian and Latin name, family name, photograph, a detailed description of the morphology (roots, stem, leaves, flower, and fruit), habitats, locations, and special features. During the hike, students were observing and actively identifying the Alpine plants with the help of experts from TNP. When students encountered the plants from their list, they presented the ID card for a particular plant to the whole class (peer-to-peer learning). After discussion, they took photos of presented plants (photo hunting).

Outdoor activities

- Trip and field work on mountain pasture Vogar

Students explored the mountain pasture Vogar and tried to find and identify the plants for which they had already prepared ID cards. Once the plant was identified the student who was responsible for its ID card had to present it. They also took pictures of the plants - photo hunting.

Tools and materials description

PowerPoint presentation, computers, list of the selected plant species for preparation of identity cards for plants, identification keys for plants, mountaineering gear (backpack, mountain shoes, sports clothing).

PROJECT STRATEGIES

Strategies, methods, techniques

individual learning - each student chose one of the typical alpine plants, based on his/her interest (build on an individual's innate motivation) and use different sources to prepare ID cards for alpine plants

learning by observing and by doing – students observe the plants with different senses (sight, touch and smell) and through lenses – photo-hunting, identified the plants by using photo identification keys

peer to peer learning, cooperative learning – students present the plant to classmates

Cross-curricular strategies

Cross-curricular: Even though the pilot action was implemented only in the framework of the VET module Protection of valuable natural values and biodiversity (in the Nature preservation programme one day per week is strictly dedicated to this VET module), the contents were also in line with subject biology, geography, physical education.

Interdisciplinary: Biology, Geography (Topology, Climate, Soil), Geology, History, Arts and Photography

2. Biodiversity of Valtellina Valley - PS9

ASM Pillar: Environmental
Macro-issues: Nature protection
Key alpine SD Issue: Diversity of species, ecosystems and habitats

Biodiversity of Valtellina Valley

Photo gallery



The landscape along the Sentiero Valtellina



FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Istituto Comprensivo 2 Damiani di Morbegno
- Parco delle Orobie Valtellinesi (non-formal)

SD VALUES

- Universalism: to protect the environment, to be unified with nature;
- Self-direction: freedom, curiosity, creativity;
- Hedonism: enjoying life;
- Achievement: to be intelligent, successful;
- Security: a healthy lifestyle;
- Benevolence: responsibility, friendship;
- Commitment to sustainable development;
- Sense of identity.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Identify typical species with the use of photo-identification keys;
- Gain knowledge about alpine plant species and their adaptations on alpine extreme environmental conditions;
- Gain knowledge about alpine flora in the province of Sondrio (and Costiera dei Ceck) with focus on abiotic parameters which influence on alpine flora in the territory;
- Gain knowledge about the structure of alpine plants and illustrate them with the aim to make botanical charts;
- Gain knowledge about alpine plants taxonomy and define a level of biodiversity on the territory – provide a list of plant species with a focus on endemic species;
- Understand the importance of biodiversity in line with the complexity of Alpine ecosystems;
- To be familiar with environmental legislation (nature conservation, protection of endangered plant species);
- Understand the principles of sustainable exploitation of natural resources (alpine plants);
- Can anticipate the negative consequences of excessive exploitation of natural resources (alpine plants);
- Recognize human impacts and their consequences on the environment (climate change, transport), ecosystems and propose sustainable actions, which will try to solve the issue or mitigate the consequences;
- Develop orientation skills (use of a compass, read a map);
- Interpret the environment and landscape;
- Create a sense of belonging to the Alps;
- To be aware of his/her role in the process of raising awareness about biodiversity, climate change in the Alps – provide didactic tools, models of participative approach (IDs of Alpine plants – WikiToLearn, guiding tour through exhibition);
- Develop communication, presentation, digital and social skills;
- Develop Learning to learn skills.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Timescales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility for the (sustainability aspects) of the project's process and output/outcome;
- Normative: Gradually recognize the meaning and applicate norms and values underlying actions; Gradually recognize the meaning and applicate norms and values underlying actions; Concepts of justice, equality, social-ecological integrity, and ethics;
- Strategic: Be committed to integrity and ethics;
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Recognize and understand relationships and complex systems;
- Collaboration: Collaborate with others and learn from others;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Be able to reflect on one's own role in the local community and (global) society; Evaluate and further motivate actions, feelings and desires; Be active in environment;
- Integrated Problem-Solving: Think about a problem critically; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. School board meeting: planning of interdisciplinary curricula // Comparison National school Law, Institute's Curriculum, Key Alpine SD Goals - Subtopics, SD Competence Assessment, SD Key Issues - Sub-topics and school curricula School National Law, institute's curriculum, Key Alpine SD Goals - Subtopics, SD Competence Assessment, SD Key Issues - Sub-topics and school curricula IC 2 Damiani Morbegno 4h
2. Classroom work: lessons, where students gain knowledge about alpine flora, biodiversity, climate change EAS, ESBL
Discussion
Working in pairs and groups Cooperative learning
Individual work
Evaluation of informative material
Writing workshop Adobe Page, PowerPoint presentation, CMAPS, Mindmap, self-notes, scientific botanical book and identification keys, botanical card IC 2 Damiani Morbegno Home Curricular hours in different subjects + Individual students homework
4. Bike trip alongside the River Adda from Morbegno to Sondrio and visited Sentiero Valtellina Learning by doing
Cooperative learning, Practical learning, Learning by doing, Nature interpretation, Active lesson of the botanical expert Notes, identification keys for alpine plants Sentiero Valtellina 8h
5. Gaining knowledge about alpine flora Lessons, implemented by botanical expert PowerPoint presentation, self-notes Classroom 2h
6. Outdoor activity - Polo della biodiversità - Morbegno EAS ESBL Learning by doing
Cooperative learning, Practical work, Learning by doing, Active lesson of the botanical expert Notes, identification keys for alpine plants Polo della biodiversità, Morbegno 5h
7. Outdoor activity in Costiera dei Ceck EAS ESBL Learning by doing Cooperative learning, observe the territory, collect botanical elements Active lesson of the botanical expert Notes, identification keys for alpine plants Costiera dei Ceck 8h
8. Production of IDs of alpine plants Peer to peer learning Cooperative learning, Use of various sources of information Identity cards for selected alpine plants Classroom 4h

Activity description

The pilot action was planned and implemented with the aim to raise awareness among students about plant biodiversity, climate change, a local protected area (Parco delle Orobie) with a special focus on the local environment. The interdisciplinary pilot action lasted the entire school year 2017/2018 and was closely intertwining with other pilot activities, creating a continuous link among them and a network of knowledge, skills and competencies.

One thing to point out is that the pilot action was marked by sustainable mobility – pupils commuted to their locations with bicycles or on foot. Pupils went on a bike trip alongside the River Adda from Morbegno to Sondrio and visited Sentiero Valtellina. Along the way, pupils were learning about the typical Alpine plants and their adaptations, about the effects of human activities and climate change on Alpine vegetation. Pupils visited the Polo Della biodiversita – Morbegno/Alpine biodiversity centre, where they autonomously searched and identified Alpine plants and studied their morphological adaptations to the Alpine conditions. With the help of the identification keys, they tried to define differences between different plant species. Preparations for the botanical fieldwork at Costiera dei Ceck took place in the classroom and pupils learned how to prepare a good plan of a field trip. One of the goals of this fieldwork was also the orientation in the hills and forest using a topographic map and a compass. At the end of all fieldwork, pupils got back to the classroom, where they worked on the collected materials and data. Pupils produced identity cards for selected Alpine plants, which contained photograph/illustration, information about taxonomic classification, morphological characteristics and adaptations, and habitats. The botanical IDs will be posted on WikiToLearn.

Outdoor activities

- Bike trip alongside the River Adda from Morbegno to Sondrio and visited Sentiero Valtellina
- Trip and fieldwork on Polo della biodiversità – Morbegno - Alpine biodiversity centre
- Trip and fieldwork on Costiera dei Ceck

The pilot actions were marked by sustainable mobility. Students commuted to their fieldwork with bicycles or on foot.

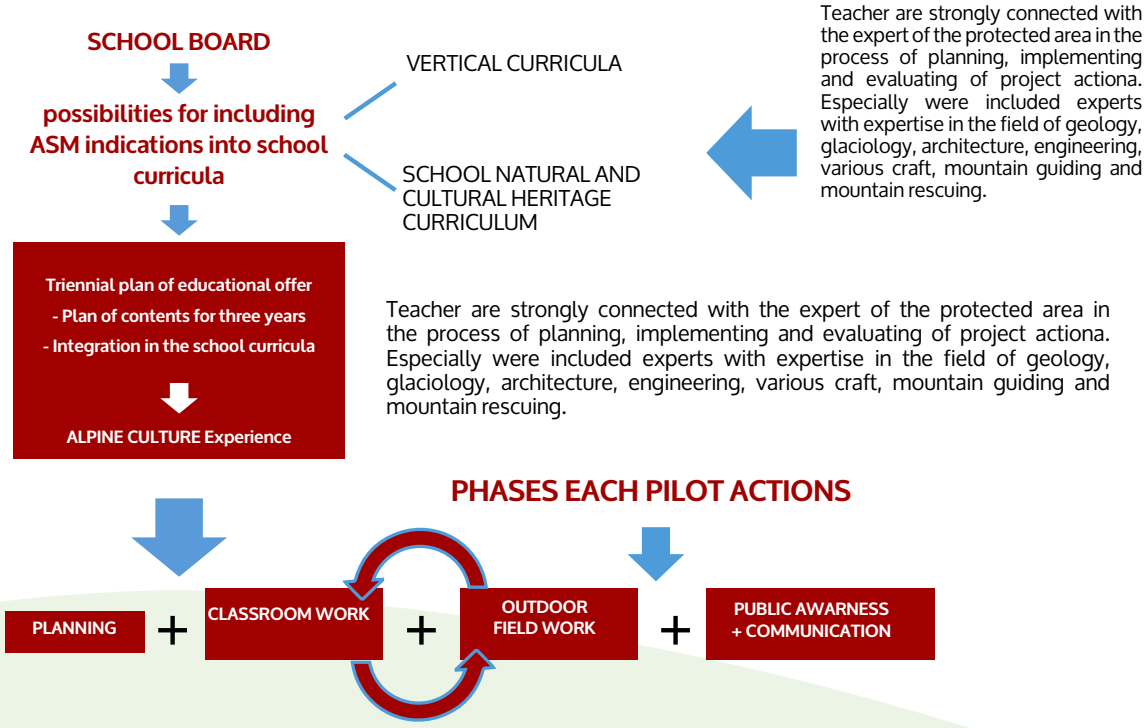
Tools and materials description

- Adobe Page, PowerPoint presentation, CMAPS, Mindmap, self-notes, Drive, LIM, PC, camera
- Use of various sources to collect information about plants for ID cards of typical alpine plants and their habitats (edaphic, topographic, atmospheric)
- photo - identification keys for alpine plants, GPS, topographic maps, compasses,
- mountaineering gears (backpacks, mountain shoes, sports clothing), bicycles

PROJECT STRATEGIES

Strategies, methods, techniques

Pilot site is engaged in the preparation of vertical Alpine school curricula.



Enquiry-based learning:

1. Preparation phase:

Fieldwork where they learned about the area in a scientific way – topography, geology, geography, botany

- riding a bicycle
- collecting samples for later analysis

The purpose of fieldwork is to obtain materials for the next phase and to raise the motivation for the next phase.

2. Prior knowledge to guide you / Inquiry and investigation

Students acquire knowledge by using active methods in various subjects in the field of biodiversity, botany, typical Alpine plants, the adaptation of plants to the Alpine climate, the influence of man and climate change on the Alpine flora.

The knowledge is gained through learner-centred methodology: use of ICT (PPT, Adobe, brainstorming with MindMap, presenting concepts with CMAPS), EAS (episodes of situated learning), mini-lessons, discussions, working in pairs, groups, cooperative learning, jigsaw cooperative learning.

In the field, students:

- try to identify plant species, their morphological adaptations to Alpine climate conditions and with the help of key plant identification key try to define the differences between species
- orientate themselves in the hills and the forest through a topographic map and a compass
- make drawings and photographs of plants for use in the next phase

* Learning through game: Orienteering race motivates students to upgrade their orienteering skills and help them to get familiar with the new environment.

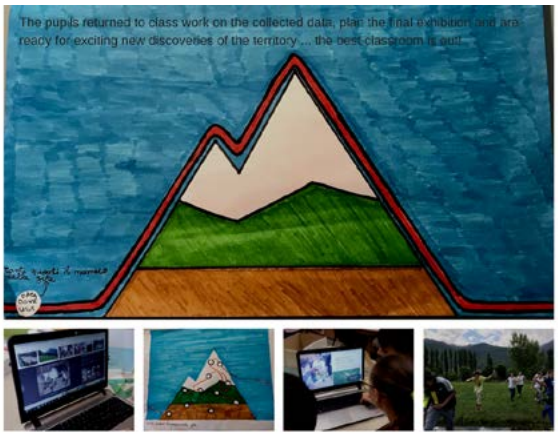
3. A solution to the problem

On the basis of the collected results, photographs, drawings and data from various sources, the students made ID botanical cards

For the purposes of the subsequent presentation, they made a model of the terrain where they worked and placed points with QR codes on it, where they presented the natural and cultural heritage of the area

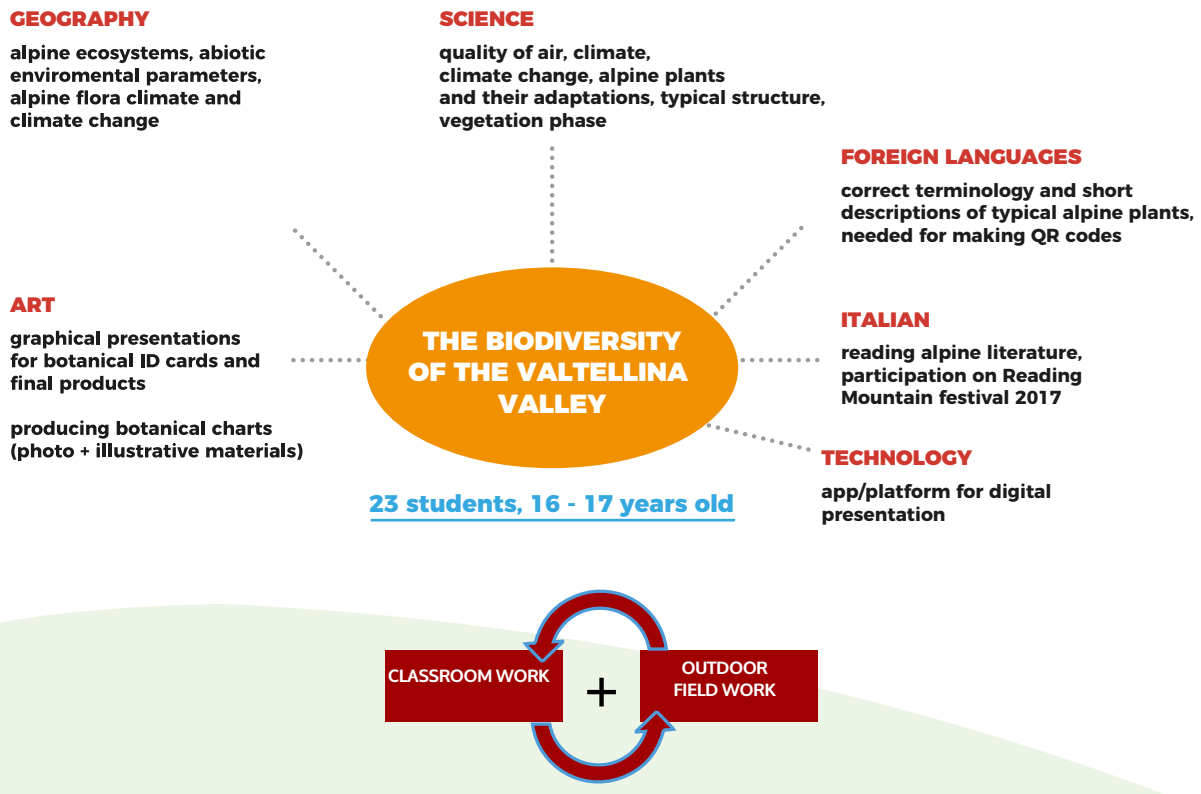
4. Presentation and evaluation

The course and results of the pilot actions were presented to the local community at the exhibition titled Climate changes and possible scenarios for the Valtellina area. During the course of the exhibition, students presented the knowledge they have acquired.



Cross-curricular strategies

Pilot action was structured in line with the cross-curricular approach. Even though it was also interlinked with other pilot actions (The morphology of the Valtellina's alpine territory) and initiatives (Reading Mountains Festival, the campaign of Radon detection - ARPA, Municipal Administration of Morbegno).



3. Fish biodiversity in Parco Alto Garda Bresciano - PS13

ASM Pillar: Environmental
Macro-issues: Nature protection
Key alpine SD Issue: Species preservation and wild population conservation

Fish biodiversity in Parco Alto Garda Bresciano

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Liceo Scientifico Enrico Fermi Salo
- Local fishermen's association
- Park of Alto Garda Bresciano (non-formal)
- Ichthyologists and other experts of biodiversity and endemism

SD VALUES

- Self-direction: curiosity, creativity;
- Tradition: respect for tradition;
- Achievement: to be capable, intelligent;
- Stimulation: variety in life;
- Universalism: protection of the environment.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Gain awareness of the importance of conserving biodiversity;
- Management of the aquatic ecosystems as renewable resources;
- Gain awareness of the material and energy flows in the ecosystem - the food chain;
- Gain knowledge about fish as one of the ecological factors through which we determine the water quality of various water bodies;
- Identifying and describing endemic species in the local environment (lake trout and carpione, another endemic species of lake trout) can define their conservation status and the causes for it;
- Gain knowledge about the conservation measures.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: information and data about plausible local area future multiple scenarios - possible, probable and desirable, timescales relevant to the problem and possible solutions, possibly previously evaluate the consequences of actions and how to prevent undesirable ones
- Strategic: Concepts and methods for strategy building;
- System Thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation; Think Global, act Local;
- Integrated Problem-Solving: Different problem-solving frameworks related to sustainability; Technologies to foster sustainable development; Think about a problem critically;

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. A conference, titled Garda's biodiversity and mountain lakes in Parco Alto Garda Bresciano Frontal method, discussion Slide, video presentation Lesson in classroom 5h
2. Excursion v hatchery, where they grow lake trout for conservational purposes Excursion, learning by observing.
3. / Hatchery of river Toscolano, in Gaino 5h

Activity description

Alpine lakes are one of the most sensitive ecosystems. Students learnt that on the example of Lake Garda. Namely, certain fish species from Lake Garda are considered as endangered due to overfishing, morphological alteration of reproductive habitats, alteration of hydrological conditions (e.g. construction of the Valvestiono dam), genetic pollution, and possibly competition from introduced species. Students visited the fish hatchery in Gaino on the river Toscolano to see what the preventive measures against fish extinction can be. Students were introduced with an example of good practice how hatchery staff succeeds in maintaining vigorous populations of endangered fish species by complicated but efficient strategies. Students also participated at the conference about Garda's biodiversity and mountain lakes in Parco Alto Garda Bresciano. They focused on lake trout and carpione, another endemic species of lake trout. Students learnt that all organisms in lake ecosystems are included in the food chain and people are part of it as final consumers. Students discussed the human influence on the lake ecosystem. Namely, people are at the top of the food chain, their actions have profound consequences for both the ecosystem and themselves.

Outdoor activities

- Excursion to a hatchery in Giano on the river Toscolano, where they are breeding lake trout for conservational purposes

Tools and materials description

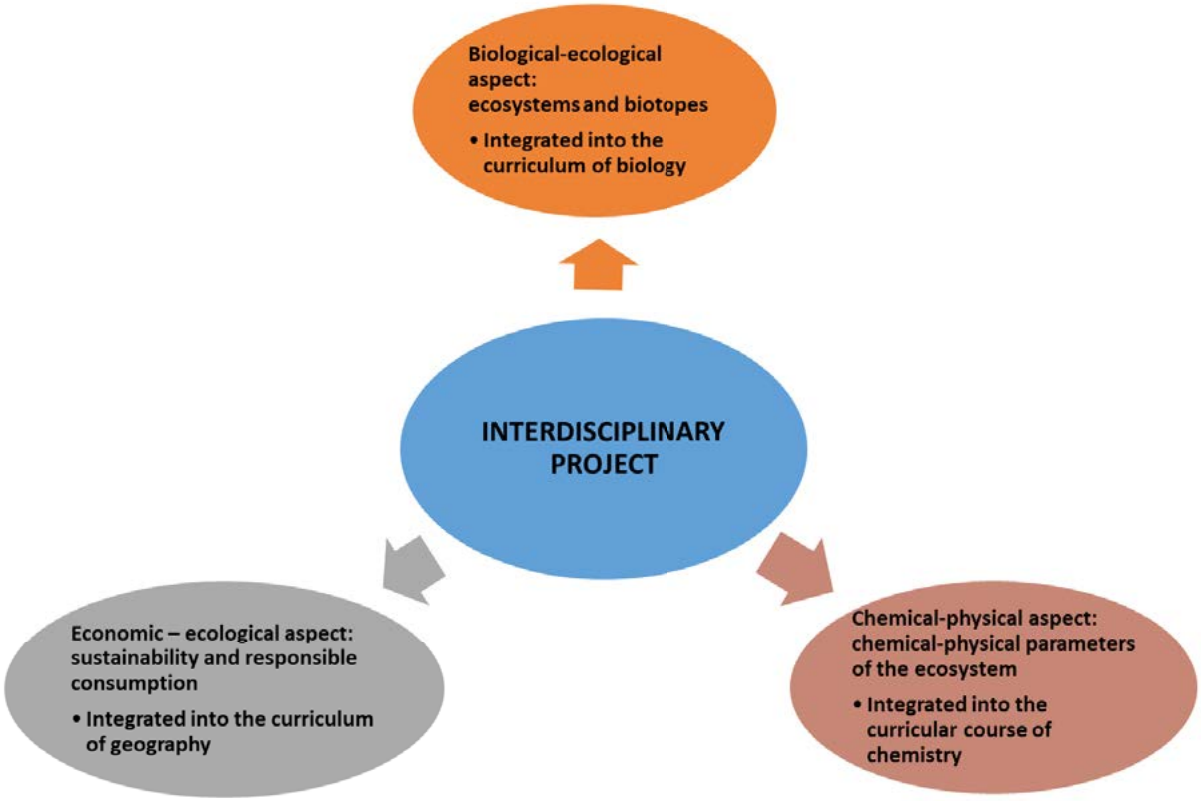
- Equipment for field observation. Camera, notes, pencils, sketchbooks

Project STRATEGIES

Strategies, methods, techniques

- In the pilot action, learning in the classroom and in the field were intertwined, and various non-formal educators (fishermen's association, ichthyologists, experts for biodiversity and endemism)
- Learning by observing

Cross-curricular strategies



4. On the path of carnivorous plants - PS14

ASM Pillar: Environmental
Macro-issues: Nature protection
Key alpine SD Issue: Management of ecosystem services

On the path of carnivorous plants

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo
- Triglav National Park

SD VALUES

- Universalism: to protect the environment, to be one with nature;
- Benevolence: to be responsible;
- Tradition: respect for tradition;
- Security: a healthy lifestyle, to be secure.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Master the basics of ecology and awareness of the importance of preserving biodiversity for the stability of ecosystems (e.g. Wetlands, high altitude peat bog);
- Recognize biotic and abiotic parameters that the wetland consists of and understand their impact on the ecosystem;
- Understand material flows in the wetlands;
- List and explain wetland functions - wetland ecosystem services;
- Know the connection between the principles and objectives of sustainable development and the implementation of spatial activities;
- Monitoring of the ecosystem (the wetland) and records its ecological status;
- Know basics of laboratory and analytical techniques and know how to use them in the laboratory or in the field;
- Know how to obtain, process, and evaluate the results of analytical measurements;
- Develop independent learning: plan, prepare, implement, and evaluate your own work;
- Develop communication and presentation skills;
- Collaborating with classmates in the field;
- Act professionally responsible.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Analysis approaches, Timescales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility of actions and choices done;
- Normative: UE, national and regional regulations, Gradually recognize the meaning and applicate norms and values underlying actions;
- Strategic: Concepts and methods for strategy building, use learner-centred methods for designing, implementing and adapting SD actions in the local communities;
- Collaboration: how to use communication tools; Collaborate with others and learn from others; Systems Thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Evaluate and further motivate actions, feelings and desires; Be active in environment;
- Integrated Problem-Solving: Different problem-solving frameworks, related to sustainability; Think about a problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. Lessons about wetlands (Types, biotic and abiotic parameters, endemic organisms, legislation, ecosystem services ...) The frontal method with discussion, using different sources and materials ...) Presentations, videos, leaflets about Ramsar convention classroom 4 hours
2. Gaining knowledge about Goreljek Peatbog (ecosystem, formation, flora and fauna, anthropogenic activities in the surrounding areas, opportunities and threats).Hike around the Goreljek Peatbog, brainstorming and discussion along the way. Looking for carnivorous plants during the hike. Students hiked along Goreljek peat bog, they stopped at every learning point in the learning path and discussed the content of learning point.Learning through game, adventurous learning – they tried to find carnivorous plants during their hike. When they finally found it, they were very motivated to learn more about it and discuss their characteristics, adaptation ... Taking notes, learning boards along the trail Goreljek, Pokljuka, Slovenia 2 hours
3. On-site physicochemical analysis of water from a peat bog Group work, practical work, learning by doing ... School equipment for water analysis (multimeter with electrodes), table for physicochemical parameters Goreljek, Pokljuka, Slovenia 20 min
4. Observing selected wetland in the local environment - an inventory of biotic and abiotic factors Individual work - students write a report at the end about the observation of the selected wetland School equipment for water analysis (multimeter with electrodes), table for physicochemical parameters Selected wetland in the local environment 5 months

Activity description

In the pilot activity within the Ecosystems, Eco-remediation and Spatial Planning module in the program of Nature protection technician, students first learned in class about wetlands as ecosystems, their types, abiotic and biotic factors and their effects on the ecosystem. Special attention was paid to ecosystem services and the human impact on wetlands.

In the second part of the pilot action, students visited Goreljek Peat bog on the Pokljuka Plateau, the one that is taken advantage of for educational and research purposes. Students walked around the peat bog (learning path) and gained knowledge about the wetland ecosystem and its formation, characteristic flora and fauna, anthropogenic activities in the surrounding areas, and opportunities and threats. Students did on-site analyses of the T, pH, and conductivity of the water, and they practically confirmed these facts. They were also observing the colour of the water, which was coloured, yellow-brownish due to the presence of humic acids. Students were looking for a carnivorous plant named round-leaved sundew Drosera rotundifolia.

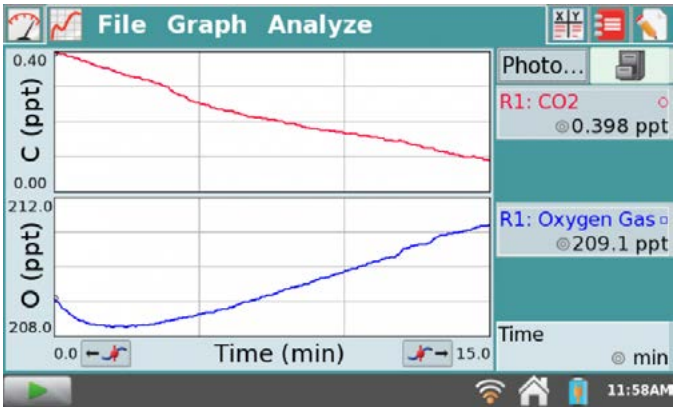
Each student then selected a wetland in the local environment, which he/she observed for 5 months. The observation included listing biotic and abiotic factors, photographing organisms and determining human impact on the ecosystem. When finished with the observation, each student wrote a report and presented it in the class.

Outdoor activities

- Visit of the learning path to Goreljek peat bog, analysis of the physicochemical water parameters and looking for carnivorous plants, determining the human impact and discussion about ecosystem services
- 5-month long observation of a selected local wetland - individual work

Tools and materials description

- Physicochemical analyses of water: multimeter and electrodes for measuring of the temperature, pH, conductivity, and dissolved O2; kit with fast qualitative tests for determination of the NH4+, NO3-, NO2-, PO34- ions; pH papers



Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning: Wetlands in my local environment - do I know them

a. Introduction to a problem: The teacher presents the assignment to the students and the information about the report on their observation of wetlands in the local environment

b. Students receive theoretical and practical knowledge in the classroom and in the field:

- frontal lecture and use of different sources: wetlands as an ecosystem, abiotic and biotic parameters, ecosystem services, human impact on the wetland, conservation legislation
- visit of the peat bog Goreljek learning path: learning by observing, practical and research work - analysis of biotic and abiotic parameters

Learning through game, adventurous learning – they tried to find carnivorous plant round-leaved sundew Drosera rotundifolia during their hike. When they finally found it, they were very motivated to learn more about it and discuss their characteristics, adaptation ...

c. Practical work: Individual work - students selected a wetland in the local environment, which they observed individually for 5 months. The observation included listing biotic and abiotic factors, collecting data, analysing it and writing a report, which also includes photographs.

d. Evaluation and presentation: Collaborate learning: students make a presentation of their selected wetland for their class. The student, teacher and classmates jointly evaluate the student's work.

Cross-curricular strategies

Cross-curricular: Even though the pilot action was implemented only in the framework of the VET module Ecosystems, eco-remediation and spatial planning module (in the Nature preservation technician program one day per week is strictly dedicated to this VET module), the contents were also in line with subject biology, chemistry, geography, and physical education.

Interdisciplinary: Biology, chemistry, geography, geology ...

5. Nature Calendar - PS3

ASM Pillar: Environmental
Macro-issues: Cultural and Agro-managed landscape conservation
Key alpine SD Issue: Farming and forestry

Nature Calendar

Photo gallery




FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Volksschule Sieggraben, Kindergarten Sieggraben, Montessorischule Bad Sauerbrunn, Kindergarten Drassburg, Volksschule Drassburg, Volksschule Schattendorf, Volksschule Loipersbach, Nature park Rosalia-Kogelberg (non-formal)
- The company that developed the "Nature calendar" app also has an important role in this pilot action. They made a presentation about the app and the corresponding material at the beginning of the implementation and provided technical support throughout the year and were also present at the evaluation meeting at the end of the pilot activity.
- The teachers depending on the activity cooperated with the local beekeepers, farmers, foresters or doctors and meteorologists - climatologists.

SD VALUES

- Universalism: to protect the environment, to be unified with nature;
- Self-direction: curiosity, creativity, choosing your own goals;
- Hedonism: enjoying life;
- Stimulation: excitement:
- Achievement: to be intelligent, successful, new capabilities;
- Security: a healthy lifestyle;
- Benevolence: responsibility, friendship;
- Commitment to sustainable development;
- Value and respect for diversity.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Know the basic life processes (growth and development of plants, plant organs - leafing, flowering, development of the fruit of the plant);
- Improving knowledge about the organisms living in a particular ecosystem - the field border (recognizes the organism and knows the name, knows its phenological phases and its use);
- Knows the basics of ecological connections (impact of abiotic parameters on plants and animals - seasons, climate change, Alpine climate, the impact of human activities on their living environment)
- Can take care of the plants (planting, watering, pruning ...);
- Establishes contact with nature through frequent observation, exploring the environment with different senses, collecting, recognizing with the use of pictorial identification keys;
- Learns the basics of the scientific approach - carries out simple experiments (growing plants under different conditions);
- Develops responsible behaviour toward the environment;
- Understand that every region has its characteristic landscapes, history of land use, its own cultural sites, animals and plants. Due to this reason, people travel around to visit those sights;
- Understands the difference between regions as protected areas provide an economic benefit for them;
- Learn about the importance of cooperation across borders in topics concerning nature. Rivers, mountains, the effects of climate change, animals and plants do not stick to borders;
- Get a feel for the biodiversity in the alpine region.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Accept the responsibility of actions and how to prevent undesirable ones;
- Strategic: Use learner-centred methods for designing, implementing and adapting SD actions in the local communities, and to deal with risks and changes;
- Collaboration: Collaborate with others and learn from others;
- System Thinking: Alpine key issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation; Analyse how systems are embedded within different domains and different scales;
- Self-Awareness: Be aware of its own role in the local community and society; Be active in environment, Think global act local;
- Integrated Problem-Solving: Inclusive and equitable solution options ICT and Technologies to foster Sustainable Development; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

ActivityDidactic methods Materials Location Time for activity

1. Planting the hedge Field work Local shrubs School, at the hedge one day Taking care of the hedge Field work Watering can, secateurs School, at the hedge Ongoing throughout the year
2. Observation activities Field work, observation, phone app Nature wall calendar, a4 aluminium boards, explorer card, phone app School, at the hedge Ongoing throughout the year
3. Additional Material Art, crafting, stories, games, worksheets - Educational materials including leaf diary, blossom diary, seasonal hedge stories, games - School, classroom Ongoing throughout the year
4. Field Trips - Field trip - Nature Park Rosalia-Kogelberg - Throughout the year

Activity description

In the pilot action "Nature Calendar" the 5 participating elementary schools and kindergartens planted a 10-seasons-hedge on their school estates, consisting of 12 native shrub species. All the activities in the pilot action were adapted to early childhood (4 – 10 years). Throughout the school year, they carried out the activities "Nature Calender" that were connected to the planted shrubs.

The app "Naturkalender" is an existing tool that allows collecting data from those shrub species and other typical species of animals, plants and their phenological phase. Some of the collected data was integrated into the European Phonological Database hosted by the Austrian "Zentralanstalt für Meteorologie und Geodynamik" (ZAMG) and will be available for climatologists all over the world. Pupils help to gain a deeper understanding of the effects of climate change on biodiversity with their observations. Apart from this, the phenological data provides useful information for the nature park Rosalia-Kogelberg, giving them information on things like when the orchard blooming season is starting or other typical phenomena that are important for economic sectors like farming, beekeeping, tourism and forestry.

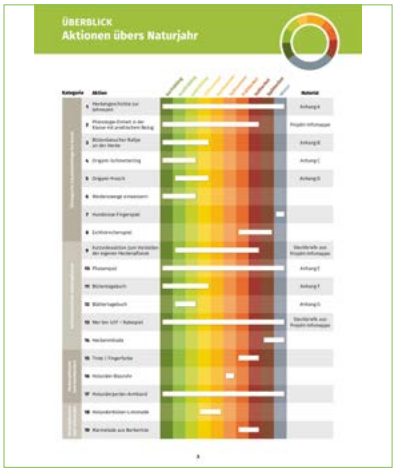
Outdoor activities

- Planting the hedge, taking care of the hedge
- Observation activities (recognizing animals and plants using pictorial identification keys, observing of the development of animals (insects, frogs), determining of phenological phases, counting and measurement in connection with plant development)
- Field trip to beekeepers, farmers, foresters or doctors

It is vital that the students make notes by drawing and writing about their observations in the diary/ app.

Tools and materials description

- App "Naturkalender"
- Materials and information handbook for the teacher about the app



- Boards and special designed phenological calendars for noting the date of phenological occurrences
- Researchers card with a magnifying glass for nature observation
- Educational material including leaf-diary and a blossom-diary
- 10 seasonal stories for storytelling in the classroom with plants and animals in the hedge as main characters
- Teaching materials with games and information for a better understanding of the shrub-species.

Project STRATEGIES

Strategies, methods, techniques

In this year-round pilot activity, the red thread is the observation of planted shrubs, which serve as a model organism for learning about growth and development of plants (determination of phenological phases). The first phase of the pilot activity included fieldwork - planting shrubs and taking care of them (watering, pruning...). It is accompanied by additional activities that enable experiential and inductive learning through the process of observation, measurement and comparison (frog development, tracking vegetation phases). Taking notes of the information about the activity in a diary - app, drawing, and storytelling allows the development of a scientific way of thinking and is in some ways a self-evaluation of the learning process. Through activities, transformative learning is encouraged that leads to a change in attitude toward the environment ... All activities promote learning through games that are of paramount importance in this child development phase. The pupils collect the observation data on special wall calendars in every classroom.

In addition, each school in the auditorium has a "nature park corner", where pupils report on ongoing projects, present drawings etc.

Cross-curricular strategies

Subjects in primary schools are not strictly separated but connected with each other. Materials from the support material cover activities in General Science, German language, Mathematics, Physical Education, Art and Cooking. Most of the subjects were taught outside in nature. The chance of natural learning places is that the realities can be used meaningfully by the learner, i.e. for concrete learning goals in the areas of knowledge, ability, understanding for learning impulses on the three levels of interaction, subject-object, subject - subject and subject can be used with themselves and thus the learning place becomes a resonance space

- All activities in kindergarten were integrated into the day.

6. Ecology, Agronomy and territorial survey at Chartreuse Regional Park - PS5

ASM Pillar: Environmental, Socio-economic
Macro-issues: Cultural and Agro-managed landscape conservation, Towards a green alpine economy
Key alpine SD Issue: Farming, Sustainable rural development

Ecology, Agronomy and territorial survey at Chartreuse Regional Park

Photo gallery




FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- EPLEFPA Reinach High school and Vocational School
- Chartreuse Regional Park

SD VALUES

- Universalism: to protect the environment, to be unified with nature, social justice;
- Self-direction: curiosity, choosing your own goals;
- Hedonism: enjoying life;
- Stimulation: excitement in life, variety in life;
- Achievement: to be intelligent, successful, ambitious, new capabilities;
- Security: a healthy lifestyle, develop a sense of belonging;
- Benevolence: responsibility, friendship, to find meaning in life;
- Tradition: respect for tradition;
- Commitment to sustainable development;
- To develop a sense of identity.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Gaining knowledge using different approaches - observing, interviews ...;
- Getting to know various agricultural activities suitable for the Alpine world;
- Getting to know different occupations in the protected area;
- Gaining knowledge in the field of biodiversity /fauna, flora, adaptation of organisms on abiotic parameters in alpine environment, ecosystems, typical alpine landscape, mountain agriculture;
- Learn different techniques of safe mountaineering in the Alps;
- Develop a scientific approach (collect and analyse information, carry out an experiment, understand cause and effect relationships, make a presentation and present it to the media);
- Be aware of ethics in science and our responsibility to the environment;
- Preserve and develop students' curiosity;
- Develop critical thinking.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Accept the responsibility of actions and choices done;
- Normative: Gradually recognize the meaning and applicate norms and values underlying actions; Negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interest uncertain knowledge and contradictions;
- Collaboration: How to use communication tools; Collaborate with others and learn from others; Understand and respect the needs, perspectives and actions of others (empathy);
- Systems thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation; Analyse how systems are embedded within different domains and different scales;
- Self-awareness: Evaluate and further motivate actions, feelings and desires;
- Integrated Problem-solving: ICT and technologies to foster sustainable development.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods Materials Location Time for activity

1. Meeting with management and educators of the natural park Interviewing experts / St Pierre de Chartreuse, France ½ day
2. Hiking with the ranger of natural reserve "Hauts de Chartreuse" Outdoor activity, Observation of fauna, flora, geology on site Binoculars Chartreuse, France ½ day
3. Meeting with a shepherd in a pasture Visit on site Questioning, debating / Alpette pasture, Chartreuse, France ½ day
4. Visiting milk-cooperative (cheese production) Interviewing experts Tasting cheese / Entremont-le-Vieux, France ½ day
5. Visiting beekeeper Interviewing expert Tasting honey / Saint Même le Haut, France ½ day
6. Visiting biogas plant Visit on site Interviewing experts / La Motte Servolex, France ½ day Visit and meeting with a market gardener in organic farming Visit on site Interviewing experts / Chambéry, France ½ day

Activity description

Students went on a 5-day excursion to the Chartreuse Regional Park, where their activities were predominantly focused on sustainable key issues in the protected area and sustainable agricultural activities on mountain farms. They met with shepherd and farm owners, discussed their activities, defined development, risk and opportunities for activities, and learnt about organic farming, mountain pasture, production of dairy products and beekeeping. They also visited the biogas plant, where students gained knowledge about waste management and energy production. Students hiked with the Chartreuse Regional park officer, where they observed Alpine flora, fauna and geomorphological characteristics of the territory. At the end of the activity, the students made presentations and posters.

Outdoor activities

- Meeting with management and educators of protected area
- Hiking with the Chartreuse Regional park officer
- Getting to know the possible activities and occupations on a mountain farm: mountain pasture, milk-cooperative (cheese production), beekeeper, biogas plant on the farm, organic farming, selling products/vegetables in specialized shops

Tools and materials description

- Binoculars, terrain shoes and equipment
- Tools needed to make the presentation

*A 5-day excursion is an organizational challenge for the activity coordinator and teachers.

Project STRATEGIES

Strategies, methods, techniques

- Learning by observing
- Interviewing
- Cooperative learning: students will have to work in a group to design a presentation about a specific topic they have chosen, linked with sustainable development issues

Cross-curricular strategies

French EPLEFPA schools – biotechnical schools have a speciality in their curricula, required by French Ministry of Agriculture. They conduct EATDD curricula, which encourage interdisciplinary approaches in the field of Ecology, Agronomy, Land use and Sustainable development. The cross-curricular approach in a French school is easier for planning and implementing because of the weekly-changing timetables. This excursion was implemented in EATDD curricula.

7. "Draußen unterrichten"– Biodiversity Strategies - PS2

ASM Pillar: Environmental
Macro-issues: Climate change Adaptation and Mitigation, Cultural and agro-managed landscape conservation
Key alpine SD Issue: Natural hazards management, Forestry

"Draußen unterrichten"– Biodiversity Strategies

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Neue Mittelschule Rechnitz
- Nature park Geschriebenstein

SD VALUES

- Universalism: to protect the environment, to be unified with nature;
- Self-direction: freedom, curiosity, creativity, choosing your own goals, to be independent;
- Stimulation: excitement in life;
- Achievement: to be intelligent, successful, new capabilities;
- Security: security of community, healthy lifestyle, develop a sense of belonging;
- Benevolence: friendship, to find meaning in life, to develop responsibility, to be helpful;
- Tradition: respect for tradition;
- Conformity: self-discipline and politeness;
- Commitment to sustainable development.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Promotion of various vocations, for example, a hydraulic engineer, urban and rural planning, biologist, natural hazards (working conditions, duties);
- Define the forest as an ecosystem and its functions;
- Define the ecosystem and species biodiversity in the forest and understand how it affects the ecosystem stability;
- Forest management - understand forest management plans, define the development phase of the forest and forest protection measures;
- Weather stations - understand how they work, understand the connection between intense rainfall and potential natural hazards (floods, landslides);
- Understand the connection between forest management measures and potential natural hazards;
- Measures which can be used for the prevention or mitigation of natural hazards;
- Develop monitoring skills in an outdoor laboratory and soil observations (soil horizons, water capacity of soil);
- Properties of construction in the flood and landslide area;
- Planning and carrying out work processes;
- Teamwork;
- Communication with peers, teachers and experts;
- Improve spatial orientation;
- Improve presentational skills.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Accept the responsibility of actions and how to prevent undesirable ones; Understanding the consequences of (un)sustainable forest management; Preparing models and analyses on sustainability impact; Preparing an evacuation plan in case of natural hazards;
- Strategic: Use learner-centred methods for designing, implementing and adapting SD actions in the local communities, and to deal with risks and changes;
- Collaboration: Collaborate with others and learn from others; Collaborate with stakeholder to specify, negotiate sustainability values, principles, objectives and goals;
- System Thinking: Alpine key issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation; Analyse how systems are embedded within different domains and different scales;
- Self-Awareness: Be aware of its own role in the local community and society; Be active in environment; Think global act local;
- Integrated Problem-Solving: Inclusive and equitable solution options ICT and Technologies to foster Sustainable Development; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods Materials Location Time for activity

1. Read and draw a plan Curricular teaching Interdisciplinary teaching Geological plan, vegetation plan, papers, pencil Steep slope, forest and creek 2h
2. Plot design - long-term monitoring Competence-oriented Learning of profession Clinometer, compass, logger tape forest 2h
3. Overview of raining station and water management Curricular teaching Interdisciplinary teaching Toy blocks, tape, hyetometer Creek and forest 2h
4. Flood management, knowledge about landslide Action-oriented teaching Model houses, model trees and a board, flags, shovel, pickaxe Creek and forest 3h
5. Flood management, knowledge about landslide Curricular teaching Interdisciplinary teaching Plan, photographs, small logs forest 2h
6. Measure trees Action-oriented teaching Diameter tape, calliper forest 3h
7. Reflexion yourself and the own work, the data in a report for students and the general public Dialogue and Coaching process interdisciplinary teaching Papers, pencil, clothespin, string, communication tools In the field 2h

Activity description

Pupils learnt about natural processes and natural hazards in the Faludital/Rechnitz area. The activity included a whole week of fieldwork. The activity site where the pupils carried out various tasks was half an hour drive away from the school.

Part of their activities was dedicated to studying the risks of flooding and (sustainable) flooding management. Pupils observed the weather station, learned about the history of flooding and interpreted the local landscape (steep slopes, forest and creek) and used all that information to define the flooding risk of the area in line with geological and vegetation plan. They made a model of the settlement and prepared simulations of extreme precipitation events on forested and deforested steep slopes and estimated the possibilities of landslides in both cases. Students tried various positions of the settlement to test the risks of flooding and landslides. With a board, little trees, miniature houses and a watering it is possible to model a slip hang and create a settlement near the hang. In that manner, pupils get a vision about the importance of smart spatial planning of settlements in areas with flooding risks, the possible consequences of heavy rain and the overflooding aftermath. The second part of the activities was dedicated to forest management. Pupils learnt how to measure trees with diameter tape, clinometer and calliper and compare their measurements with the national forest development plan. Pupils studied the forest development plan, proposed the sustainable actions for forest management and conducted a plot design for long-term monitoring. This way they established a series of permanent sample points to provide an outdoor laboratory for the study of natural processes.

Outdoor activities

See above

Tools and materials description

Clinometer (Suunto), compass, increment borer, diameter tape, logger tape and calliper, axe, pit saws, shovel, pickaxe, small logs, toy blocks, hectometre, geographic, geological plans, forest map, app, photographs

Project STRATEGIES

Strategies, methods, techniques
Experiential learning - use of model

1. Introductory phase:
- Introductory motivational activity: pupils get acquainted with the area - orientation in a new area
- Introductory activities: with the help of different learner-centred methodologies pupils gain the knowledge needed for the experiment
- Retrospective learning: pupils define the flooding risk based on the flooding frequency in the area.
- Visualisation: visiting a weather station and using the hyetometer to measure the rainfall and therefore improving their perception of these methods.
- Learning by doing: research soil horizons with a shovel and try to determine their characteristics, define water storage capacity with the bottle experiment.
- Learning by doing: Pupils learnt how to measure trees with diameter tape, clinometer and calliper and compare their measurements with the national forest development plan. Pupils studied the forest development plan, proposed the sustainable actions for forest management and conducted a plot design for long-term monitoring.

2. Phase - Concrete experience: a teacher and an expert gave instructions and then the pupils independently performed the activity:
- Pupils divided the forested slope into 2 areas: one is the control area, the second one is for the experiment where they cut the trees. They use water to simulate extreme rainfall and define the area where there is the highest risk of landslides.
- Analysing the information gained through the experiment they choose the optimal location for building a settlement
- The Wau effect that improved the motivation was when they cut down a tree.

3. Phase - Reflective observation and abstract conceptualisation:
- Pupils analyse the tasks and activities and form conclusions with the help of a questionnaire prepared by the teacher and the expert.

4. Phase - Transfer the knowledge
- Pupils also played a role game, in which they tried to imitate the task of the major, experts, government and local people in the process of hazard management.

Cross-curricular strategies
Activity was planned and implemented within the Nature park school. It incorporated an interdisciplinary approach in the field of biology, geology, geography and included the promotion of different vocations.

8. The morphology of Valtellina's Alpine territory - PS9

ASM Pillar: Environmental
Macro-issues: Climate change Adaptation and Mitigation
Key alpine SD Issue: Climate change

The morphology of Valtellina's Alpine territory

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Istituto Comprensivo 2 Damiani di Morbegno
- Parco delle Orobie Valtellinesi (non-formal)

SD VALUES

- Universalism: to protect the environment, to be unified with nature, see beauty in the world;
- Self-direction: freedom, curiosity, to be independent;
- Stimulation: excitement in life, variety in life;
- Achievement: to be intelligent, successful, new capabilities;
- Benevolence: responsibility, friendship;
- Tradition: respect for tradition;
- Commitment to sustainable development;
- Believe that people can make a difference.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Gain knowledge about geology, geomorphology, glaciology in line with characteristics of alpine territory, alpine phenomena and climate change
- Gain knowledge about geology, geomorphology, glaciology in the province Sondrio and Valtellina valley
- Classify the rock types with identification keys
- Identify the surface geomorphological phenomena
- Through observation of territory try to interpret an origin of geological and geomorphological phenomena
- Understand that geological and geomorphological characteristics of territory have an impact on alpine ecosystems and their complexity
- Recognize some geomorphological and glacial phenomena (Giants' pots) as a natural heritage and consequently evaluate (positive and negative) impacts of human activities (mass tourism)
- Propose sustainable actions for the conservation of natural heritage
- To plan, prepare, implement and evaluate his/her own work
- Try to connect theoretical knowledge, gained in the classroom, with the fieldwork – interdisciplinary thinking
- Use different sources to collect information (think critically – find, select and validate information)
- Develop scientific thinking (the process of scientific work: collecting information, plan and implement the experiment, analyzing the results and conclusions)
- Create a sense of belonging to the Alps
- To be aware of his/her role in the process of raising awareness about sustainable development key issues in the Alps (mass tourism, climate change, loss of biodiversity, transport) among local people- provide didactic tools, models of participative approach (IDs of geomorphological phenomena – WikiToLearn, guiding tour through exhibition)
- Develop communication, presentation, digital and social skills
- Develop Learning to learn skills (the process of individual learning)

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Time scales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility for the (sustainability aspects) of the project's process and output/outcome;
- Normative: Gradually recognize the meaning and applicate norms and values underlying actions; Gradually recognize the meaning and applicate norms and values underlying actions; Concepts of justice, equality, social-ecological integrity, and ethics;
- Strategic: Be committed to integrity and ethics;
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Recognize and understand relationships and complex systems;
- Collaboration: Collaborate with others and learn from others; Understand diversity especially those related to cultural and social aspects;
- Self-Awareness: Be able to reflect on one's own role in the local community and (global) society; Evaluate and further motivate actions, feelings and desires; Be active in environment;

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods Materials Location Time for activity

1. Define the quality of air and try to analyse the results in line with the cause of climate change Cooperative learning, Practical learning, Learning by doing, Laboratory work, Research work Pc, Arduino boards digital atelier 10h
2. Organisation of an exhibition, titled "Climate changes and possible scenarios for Valtellina" Individual work, develop communication and presentation skills Photos, pictures, images Cloister of Sant Antonio in Morbegno 6h
3. Bike trip alongside the River Adda from Morbegno to Sondrio and visited Sentiero Valtellina Cooperative learning, Learning by observing, Learning by doing, interpret the landscape Bikes, photos, bags/boxes for collecting samples Sentiero Valtellina 8h
4. Gaining knowledge about glacial geomorphology Frontal lecture from the glaciologist expert in the classroom PowerPoint presentation, notes Classroom 2h
5. Educational trip in Cavaglia by Bernina express Cooperative learning, Learning by observing, Observing through photographic lenses, Photos, pictures Cavaglia (Switzerland) 8h
6. Gaining knowledge about Valtellina geomorphology Frontal lecture from the geologist expert in the classroom PowerPoint presentation, self-notes Classroom 2h
7. Classification of rocks into rock types and preparation of IDs of typical rock types Learning by doing, Practical work, Collecting information using various sources, Collaborative learning Notes, identification keys for rocks Digital Atelier 2h

Activity description

Pilot action "The (geo) morphology of the Valtellina's Alpine territory" of the I.C.2 Damiani Morbegno (PS9) was divided into 3 inter-connected topics: climate change, glaciology, and geology. The pilot action lasted the entire school year 2017/2018 and many activities were carried out, some in the classroom others in the field. Topics were included in different school subject – multi-perspective approach:

a. Climate changes

Pupils gained knowledge about anthropogenic activities, which contribute to climate changes, and about the climate change monitoring systems. Pupils measured physicochemical parameters of the air, such as temperature, humidity, and carbon dioxide concentration with Arduino boards with the aim of determining the air quality. Pupils participated in awareness-raising campaign of Radon detection (ARPA Lombardia, Municipal administration of Morbegno). In addition, pupils actively approached their local community to raise awareness about the issues of climate change. They prepared an exhibition entitled "Climate changes and possible scenarios for Valtellina", where they presented their work and results. Students guided visitors through the exhibition, which was enriched by lectures on climate change experts (impact of climate change on the local environment, the melting of glaciers, and the economic consequences.)

b. Glaciology

In the preparation phase, pupils visited Sentiero Valtellina alongside river Adda from Morbegno to Sondrio on bicycles to collect samples for their subsequent analysis in the classroom. In the classroom, under the mentorship of an expert, they acquired knowledge about the glacial morphology of the province Sondrio, the mountain glaciers and valleys with focus on erosive phenomena, which have contributed to the current conformation of the Valley. In addition, pupils took the Bernina express and visited the Glacier garden in Cavaglia (Switzerland), where they went on a hike in the Posschiavo Valley. During their hike in Cavaglia pupils collected information on potholes, deep holes curved in the rock with typical cylindrical shapes. Data was analysed later in the classroom, the presentation was prepared and translated.

c. Geology

In the classroom and in the laboratory pupils were learning about the rock types, geomorphology of Valtellina, glacial morphology of the province Sondrio, the mountain glaciers and valleys with focus on erosive phenomena, which have contributed to the current geomorphological conformation of the Valley. The geological fieldwork took place at various locations, in Morassione, Valgerola, Val Masino, and Valmalenco and the main priority was to analyse the valley ground.

Outdoor activities

- An educational trip by bike along the Valtellina path
- An educational trip in Cavaglia by Bernina express

Tools and materials description

- PowerPoint presentation of an expert and self-notes.
- Identification keys for rocks
- Use of technological platforms, for processing and sharing of cards and for researching and processing information.
- Textbooks, LIMs, easily available materials, PCs, Arduino boards for the collection of some environmental parameters (temperature, humidity, CO_2 concentration).
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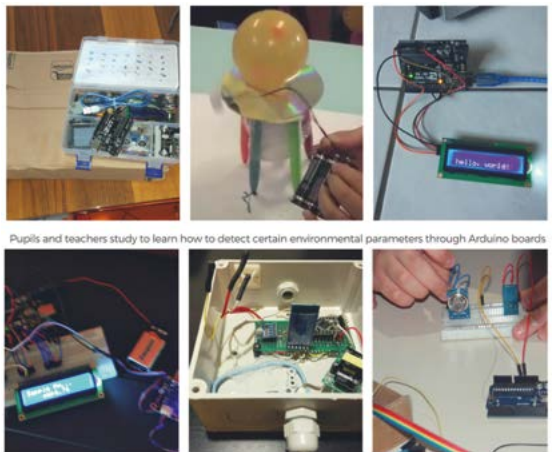
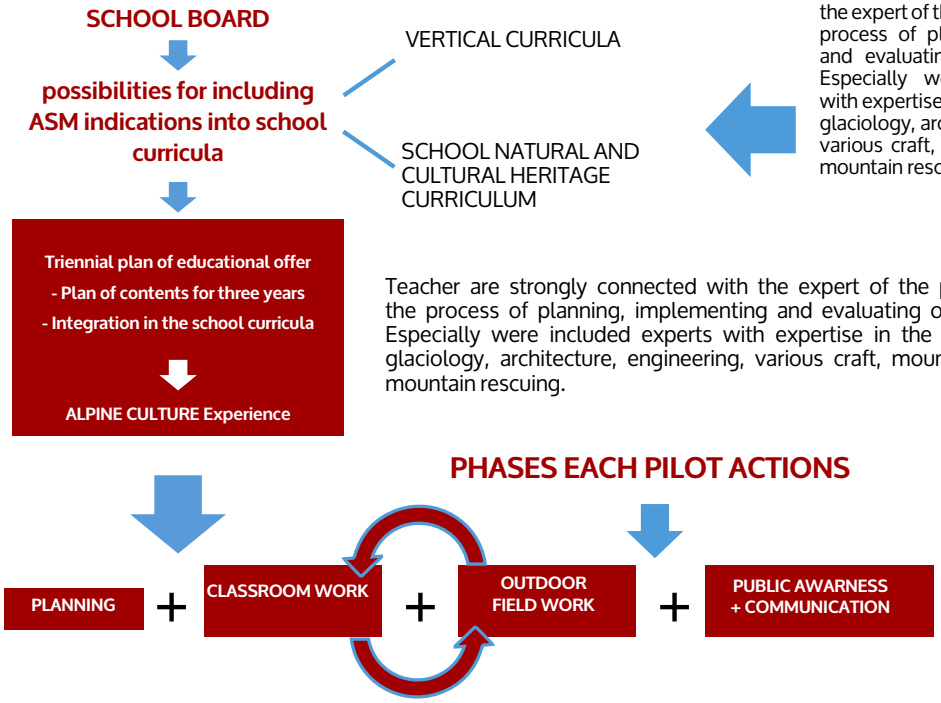


Pupils and teachers study to learn how to detect certain environmental parameters through Arduino boards

Project STRATEGIES

Strategies, methods, techniques

Pilot site is engaged in the preparation of vertical Alpine school curricula.



Inquiry-based learning:

1. Preparation phase:

Fieldwork where they learned about the area in a scientific way – topography, geology, geography, botany ...

- riding a bicycle
- collecting samples for later analysis
- The purpose of fieldwork is to obtain materials for the next phase and to raise the motivation for the next phase.

2. Prior knowledge to guide you / Inquiry and investigation

Students acquire knowledge by using active methods in various subjects in the field of glacial geomorphology of the province Sondrio: - the mountain glaciers, valleys, erosive phenomena, the conformation of the valley, potholes. The knowledge is gained through methodology: use of ICT (PPT, Adobe, brainstorming with MindMap, presenting concepts with CMAPS), EAS (episodes of situated learning), mini-lessons, discussions, working in pairs, groups, cooperative learning, jigsaw cooperative learning.

In the field students:

- try to research geomorphological phenomena with using different senses
- a scientific approach to geomorphological phenomena: measure depth, a diameter of potholes and try to find the date of discovery

- make drawings and photographs of various rocks and geomorphological phenomena

3. A solution of the problem

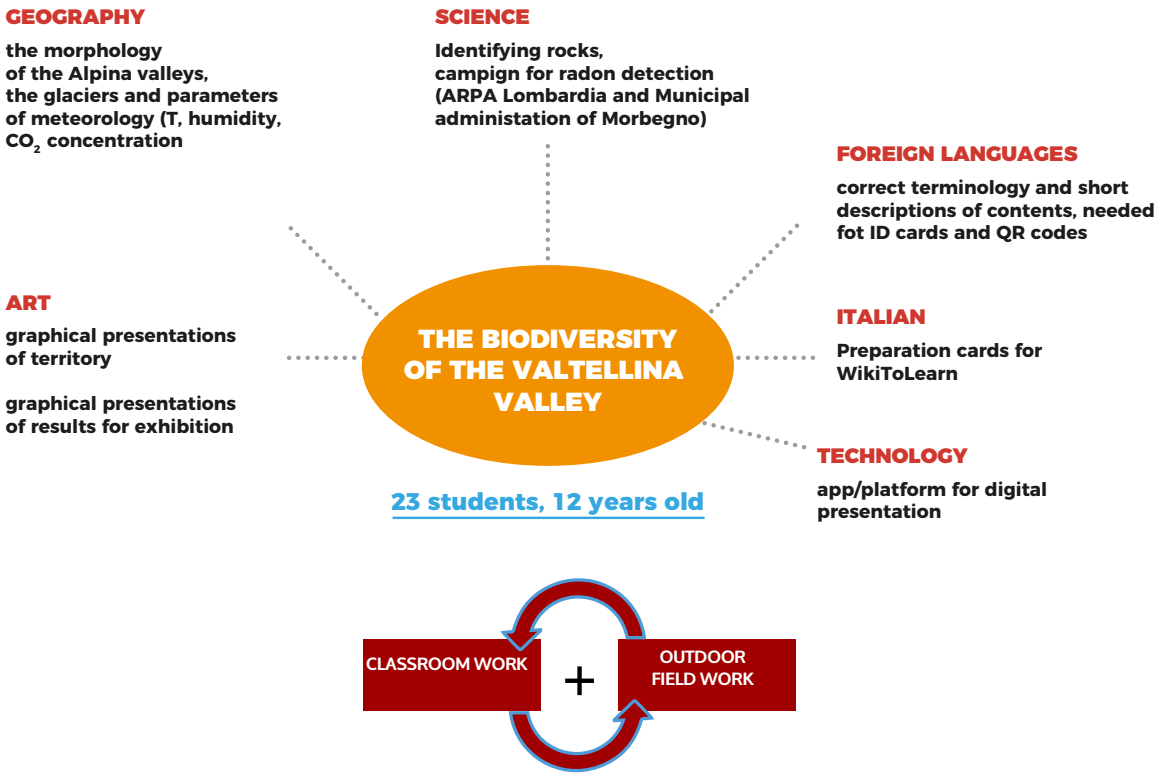
In the classroom/laboratory students review and analyze the samples – they try to classify the rocks with identification keys. They observe their characteristics with different senses. They collect data, make an analysis and graphical presentation. They prepare cards of rock types in Valtellina area for publishing on WikiToLearn

Cross-curricular work on final products of pilot action - ID cards of typical rock types (preparation of text, translation, use of ICT)

4. Presentation and evaluation

The course and results of the pilot actions were presented to the local community at the exhibition titled Climate changes and possible scenarios for the Valtellina area. During the course of the exhibition, students presented the knowledge and results they have acquired.

Cross-curricular strategies



9. The trees in the Alps as a signal of climate change: the case of Sonico chestnut trees (in Camonica Valley) - PS12

SM Pillar: Environmental, Socio-economic
Macro-issues: Cultural and Agro-managed landscape conservation, Natural resources exploitation and management, Towards a green alpine economy
Key alpine SD Issue: Forestry – multifunctional role of mountain forest, Sustainable rural development

The trees in the Alps as a signal of climate change: the case of Sonico chestnut trees (in Camonica Valley)

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Liceo Scientifico Statale Annibale Calini
- Parco dell'Adamello (non-formal)

SD VALUES

- Universalism: to protect the environment, to be unified with nature;
- Self-direction: curiosity, creativity;
- Stimulation: excitement in life;
- Achievement: to be intelligent, to be successful, new capabilities;
- Security: a healthy lifestyle;
- Benevolence: friendship, to be responsible;
- Commitment to sustainable development;
- Belief, that people can make a difference;
- Sense of identity.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Gain knowledge about tree varieties, the population of trees (trees community), forest ecosystem with an emphasis on typical Alpine forest and its development through history;
- Gain knowledge about plant physiology, growth process and impact of abiotic environmental parameters on the growth of trees (geo-morphological structure, quantity and distribution of orographic precipitation);
- Gain knowledge about the ecological services of the forest;
- Gain knowledge about using tree characteristics to determine the climate conditions where they grew;
- Understand the importance of sustainable forest management and the consequences of uneconomical forest exploitation;
- Gain knowledge of tree marking and can perform it with help;
- Gain knowledge of forest sampling and the equipment needed to perform it;
- Use of basic research methods (sampling, performing measurements, analysis, graphical presentation, interpretation of results, dissemination);
- Develop competencies of collaborative working;
- Knows prehistoric art in Camonica Valley.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios - possible, probable, desirable; Analysis approaches; Timescales relevant to the problem and possible solutions; Create one's own vision for the future; Possibly previously evaluate the consequences of the actions and how to prevent undesirable ones;
- Strategic: Viability, feasibility, efficiency of systemic interventions and the potential of those interventions to produce unintended consequences; Use learner-centred methods for designing, implementing and adapting SD actions in the local communities and to deal with risk and changes;
- Collaboration: How to use Communication tools; How to use participative and cooperative methods; Collaboration with others and learn from others;
- System thinking: Alpine key sustainability issues, their causes and consequences, actions, interests and mandates of key stakeholders in the problem constellation; Think Global, act Local.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. Field activity Excursion, laboratory activity,work, collaborative work, frontal method, individual activity / Sonico (centuries-old chestnut forest) 3h
2. Field activity Sampling Sampling tools Coren de le fate 4h
3. Lesson Presentation / Sonico (hotel) 2h
4. Field activity Excursion / Sonico (Cross area), Rino (Oglio River), Coren de le fate 11h
5. Management Workgroup / Sonico (hotel) 4h
6. Field activity Sampling Sampling tools Malga Valley (forest), Malga Valley (trenches and forest) 8h

Activity description

Students learned about Camonica valley as a territory with special geographic, geological and climate conditions. They studied the forest from the viewpoint of individual plant (plant physiology), a community of trees as well as the entire forest ecosystem, where they focused on the specificities of Alpine forest ecosystems. They were also interested in the roles of forest ecosystems (ecological, social and economic) and forest wildlife. From the point of view of forest management, they were determining the development phase of the forest by measuring the width and height of the trees. Students learnt about sustainable and unsustainable forest management practices and their economic and environmental impact. They also focus on the rules of behaviour in the forest, as well as the impact of human activities on the forest. Students tried to feel the forest with all their senses - stopping in the dark ditch and walking on moss. These experiences have a significant impact on their motivation for learning. The students conducted a simulation of writing a letter to the authorities, with which they wanted to raise awareness of the forest management state and the implementation of reforestation (its organization and implementation).

Outdoor activities

- Excursion to Sonico where there is a centuries-old chestnut forest, Coren de le fate, Rino (Oglio River and Malga Valley)

Tools and materials description

- Presser gimlet, diameter measurer, ruler, axe-brand

Project STRATEGIES

Strategies, methods, techniques

The students learned about the forest in the outdoor classrooms, the motivation grew with the observation of the forest using different senses (examples - walking in the forest in the dark, walking on the moss). Through learning by doing and practical work students sampled the forest. The data were collected, statistically processed and analysed. Based on the information, they discussed together with experts further measures in forest management (research work).

Students also simulated problem work with a participatory approach - writing letters to local authorities and carrying out an afforestation action.

Cross-curricular strategies

Activities were carried out using the interdisciplinary approach: botany, geomorphology, physic, economy, law, dendrology, ecology, history, plant physiology, environmental geology, hydrological science, pedology, zoology, meteorology.

10. The quality of water in Parco Alto Garda Bresciano – PS13

ASM Pillar: Environmental
Macro-issues: Natural resources exploitation and management
Key alpine SD Issue: Water

The quality of water in Parco Alto Garda Bresciano

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Liceo Scientifico Enrico Fermi Salo
- Park of Alto Garda Bresciano (non-formal)

SD VALUES

- Self-direction: curiosity, creativity;
- Universalism: broad-minded, to see the beauty and peace in the world;
- Tradition: respect for tradition;
- Achievement: to be intelligent, new capabilities.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Understanding of the influence of pollutants on ecosystems;
- Preparing samples for analyses of environmental parameters – water;
- Use of laboratory equipment and appropriate measuring instruments;
- Carrying out analytical methods for the evaluation of environmental/water parameters in the field and in the laboratory;
- Performing field physicochemical measurements and assessing the state of aquatic and riparian ecosystems;
- Describing, explaining and implementing the basics of technologies, their critical points and environmental parameters that need to be monitored in the individual technological process - classical paper production;
- Collecting, recording, processing the results of the measurements, graphically presenting them and analysing them for the needs of the reports.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Analysis approaches; how to evaluate possible impacts; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones;
- Normative: EU, national and regional regulations;
- Strategic: Concepts and methods for strategy building; Use learner-centred methods for designing, implementing and adapting SD actions in the local communities, and to deal with risks and changes;
- Collaboration: How to use communication tools, collaborate with others and learn from others;
- System Thinking: Alpine key sustainability issues, their causes and consequences; Think Global act Local;
- Self-Awareness: Be able to reflect on one's own role in the local community and (global) society;
- Integrated Problem-Solving: Technologies to foster sustainable development; Think about problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. Water quality assessment surveys through chemical-physical analysis of lake and river water samples. Frontal method, group work, practical work, laboratory work, discussion, evaluation laboratory equipment Lago di Garda Lessons at school and laboratory at school. 10h
2. Data processing, graphics presentation and analysis Frontal method, research work, discussion, evaluation ICT Lessons at school and laboratory. Excel as a software instrument to work. 20h
3. Use of water to produce paper. Comparison with the Japanese method of production Frontal method, group work, laboratory activity equipment and raw materials for papermaking Lessons and laboratory at the Museo della Carta in Toscolano Maderno. 5h

Activity description

Students sampled and analysed the physicochemical parameters of water in lake Lago di Garda and river. In the process of compiling a report, students had to collect results, analyse them and make graphical presentations for the report - this process was carried out independently under the supervisor of the teacher.

During the museum visit, the students learned about the classic technology of paper production in the local environment and its history and made paper according to the Japanese method. They also compared the production process from a sustainable point of view, with an emphasis on consumption and pollution of water.

The project activities continued with internship of some students. One part of the pilot activity focused on the hydrogeological study of the river basin, where students gained knowledge about the territory of the Parco Alto Garda and its hydrological characteristics. Students were also getting familiar with rock types and their historical origins and glacial phenomena.

Outdoor activities

- Water sampling of the river and the Lago di Garda which was used for later analysis
- Visit of the Museo della Carta and Toscolano Maderno, where they participated in a papermaking workshop

Tools and materials description

- Equipment for performing analysis of the physicochemical parameters of water
- Equipment and raw materials for papermaking

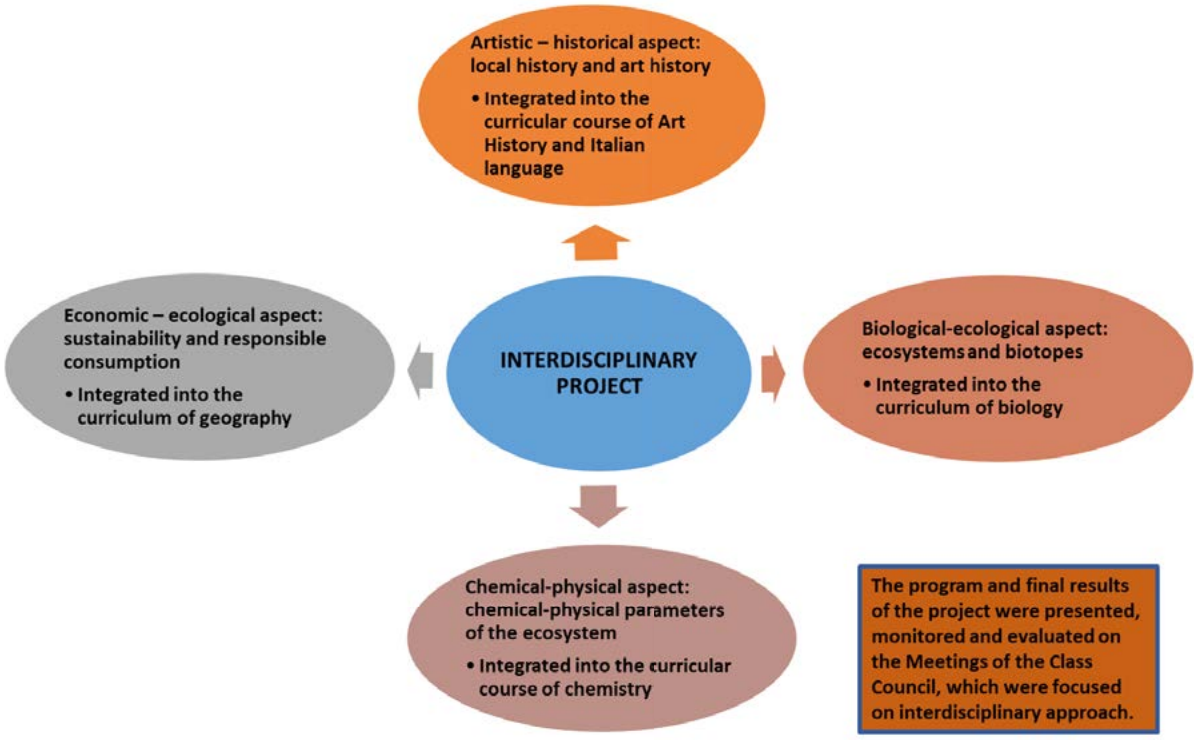
Project STRATEGIES

Strategies, methods, techniques

Pilot action used different methods: work in the classroom, in the field, with the help of non-formal educators (museum, associations...).

More information about those methods:

- Practical work/learning by doing: sampling and analysing physicochemical parameters of water in the field, papermaking;
- Laboratory work: implementation of analytical techniques;
- Research work: preparation of the report (collection and processing of data, graphical presentation and analysis), introduction part consists of theory which they procured from various sources;
- Teamwork and collaborative work: group work, reporting on the results of analyses to classmates, followed by a discussion.



Cross-curricular strategies

11. Physicochemical and biological state of selected water ecosystems in the Alpine space - PS14

ASM Pillar: Environmental
Macro-issues: Natural resources exploitation and management
Key alpine SD Issue: Water

Physicochemical and biological state of selected water ecosystems in the Alpine space

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo
- Triglav National Park
- Slovenian Environment Agency (ARSO)

SD VALUES

- Universalism: to protect the environment;
- broad-minded, to see the beauty and peace in the world;
- Tradition: respect for tradition;
- Security: a healthy lifestyle;

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes):

- Know basics of laboratory and analytical techniques and knows how to use them in the laboratory or in the field;
- Know physicochemical and ecological properties of alpine surface elements;
- Is familiarized with legislation concerning protected area (Triglav national park), Natura 2000 and monitoring activities arising from The EU Water Framework Directive;
- To perform physicochemical and ecological analyses of water samples independently;
- Know how to obtain, process, and evaluate the results from analytical measurements (how to write a report);
- Know how to maintain laboratory instruments and equipment;
- Understand the effects of pollutants on various (aquatic) ecosystems;
- To plan, prepare, implement, and evaluate your own work;
- Connecting theory with practice and to think interdisciplinary;
- To collaborate with classmates in the field;
- Develop sense and values for nature, environment, and natural features;
- To develop communication and presentation skills.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Time scales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility of actions and choices done;
- Normative: EU, national and regional regulations, gradually recognize the meaning and applicate norms and values underlying actions;
- Strategic: Use learner-centred methods for designing, implementing and adapting SD actions in the local communities;
- Collaboration: Collaborate with others and learn from others;
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandated of key stakeholders in the problem constellation;
- Self-Awareness: Be aware in its own role in the local community and society;
- Integrated Problem-Solving: Think about a problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods, Materials Location Time for activity

1. Carry out physicochemical and ecological analyses within the framework of VET module Ecological analysis and monitoring Learning by doing, Practical work, laboratory work, work in the field laboratory equipment, identification keys, classroom, school laboratory whole school year- 186 hours
2. Gaining knowledge about the Radovna River, sanitation of Bled Lake, monitoring of the freshwater ecosystems Frontal lecture + demonstration from the ARSO and TNP expert in the field Job shadowing – they observe the experts in their work at the field Professional multifunctional sensor, table for physicochemical parameters Grabče, Zgornje Gorje, Slovenia 60 min
3. On-site physicochemical analysis of Radovna River Group work of students, - practical work, learning by doing, research work collaborate work School equipment for water analysis (multimeter with electrodes, a kit for qualitative determination of certain ions), table for physicochemical parameters Grabče, Zgornje Gorje, Slovenia 45 min
4. Sampling of benthic invertebrates with catching net and collecting stones from the river, observation and identification Group work, - practical work, learning by doing, adventurous learning – walking in cold water and searching the benthic invertebrates, research work Taking self-notes and photographs, identification keys for selected benthic invertebrates On the bank of Radovna River, Krnica, Zgornje Gorje, Slovenia 2 h
5. Students write a report at home on the physicochemical and ecological analyses they carried out individual work, work in smaller groups results of the analysis, computer at home 4 h

Activity description

This pilot action was the practical conclusion of the VET module Ecological analyses and monitoring, which the students attended the whole school year. The main objective of the VET module is to teach the students how to define the physicochemical and biological state of selected surface water ecosystems (theoretical knowledge + practical skills in the laboratory and in the field).

Students gained knowledge about monitoring of the freshwater ecosystems and sampling methods at alpine river Radovna from the expert, who performed a demonstration of water analysis with the use of professional instruments. In addition, students performed physicochemical analysis on their own by using school equipment (temperature, pH, conductivity, and dissolved O2 using multimeter and electrodes; and kit with fast qualitative tests for determination of the NH4+, NO3-, NO2-, PO43- ions) and compared the results of both analyses. They also sampled benthic macroinvertebrates with catching net and collected stones from the river. They tried to identify them with the help of photo-identification key and assessed the ecological state of the river Radovna.

After the activities were carried out, the students had to write a report about the analyses where they wrote down the results, analysed and presented them.

Outdoor activities

Hike up the valley of Radovna River and gaining knowledge and developing skills about physicochemical and ecological monitoring, sampling methods.

Tools and materials description

- Mountaineering gear (backpack, mountain shoes, sports clothing)
- Notes
- Table for the writing of the measured physicochemical parameters
- Photo-identification keys for assessing the ecological state and benthic invertebrates
- A sampling of benthic invertebrates: lab tray, catching net, magnifying glass, forceps, spoon, Pasteur pipette
- Physicochemical analyses of water: multimeter and electrodes for measuring of the temperature, pH, conductivity, and dissolved O2; kit with fast qualitative tests for determination of the NH4+, NO3-, NO2-, PO34- ions; pH papers.

Project STRATEGIES

Strategies, methods, techniques

- Continuous learning through the school year (frontal method, individual and teamwork, practical work);
- Frontal presentation and demonstration of sampling and analysing of water and identification of the benthic invertebrates by the experts from ARSO and TNP – job shadowing;
- Work in smaller groups - research work:
- Analysis of physicochemical parameters of the alpine river Radovna – practical work, learning by doing
- Active observation and photo-hunting, identification of benthic invertebrates with photo identification keys – practical work, adventurous learning – walking in cold water and searching the benthic invertebrates
- Presentation of identified invertebrates to the classmates – collaborative learning
- Preparation of the report (individual work or in smaller groups)

Cross-curricular strategies

Cross-curricular: Even though the pilot action was implemented only in the framework of the VET module Ecological analysis and monitoring (in the Nature preservation programme one day per week is strictly dedicated to this VET module), the contents were also in line with subject biology, chemistry, geography, and physical education. Chemistry and Biology teachers teach the module jointly.

12. Educational Program - Waste problems in alpine regions and in a global perspective - PS1

ASM Pillar: Environmental,
Macro-issues: Natural resources exploitation and management
Key alpine SD Issue: Waste management

Educational Program - Waste problems in alpine regions and in a global perspective

Photo gallery




FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Gymnasium Berchtesgaden
- Berchtesgaden National Park

SD VALUES

- Universalism: protecting the environment, see the beauty in the world, social justice,
- Tradition: respect for tradition;
- Self-direction: self-respect, creativity, choosing own goals,
- Conformity: self-discipline,
- Sense of belonging,
- Hedonism: enjoying life, pleasure.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- (Local) waste production, waste separation, waste prevention and recycling;
- Decomposition times of different types of waste;
- Understanding problems that are caused by the huge amount of waste;
- The complexity of the global plastic waste problem;
- Problems and possible solutions of fast fashion and synthetic fibres in clothes;
- Own contribution to problem-solving;
- Reflection of one's own consumption behaviour;
- Teamwork;
- Communication and presentation skills;
- Analysing and solving problems;
- Develop scientific thinking;
- Self-reflection of own behaviour;
- Open to other opinions and varying perspectives.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about local waste production; Evaluating possible impacts; Theory about the future and desirable future scenarios; create one's own vision of the future; foresee consequences of actions; Accept responsibility of actions and choices done;
- Normative: Concepts of justice, equity, social-ecological integrity, Ethics; Gradually recognize the meaning and applicate norms and values underlying actions; Negotiate sustainability values, principles, goals and targets in a context of conflicts of interest, uncertain knowledge and contradictions; Be open to other opinions;
- Strategic: Be committed to integrity and ethics; Be open to varying perspectives; Be willing to act despite inconclusive or incomplete information;
- Collaboration: communication between each other, categorize different opinions; functional values regulation social cohesion in local communities; Teamwork; Collaborate and learn from others; Be able to motivate; Understand and respect the needs, perspectives and actions of others (empathy); Understand diversity especially those related to cultural and social aspects; Embrace diversity among cultures and social groups;
- Systems Thinking: Alpine key sustainability issue, the cause and consequences: waste; Relations between different causes: Actions, interests and mandates of key stakeholders in the problem constellation; Be able to think about the problem critically and globally; Think global act local;
- Self-Awareness: Know one's own role in the local community and society; Reflect one's own role in the local community and society; Evaluate actions, feelings and desires; Be active in environment; Deal with one's feelings and desires;
- Integrated Problem-Solving: Different problem-solving frameworks related to sustainability and develop viable solutions; Be able to think about a problem critically and globally; Apply problem-solving approaches and develop viable, equitable solutions; Deal with conflicts in a group; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity	Didactic Methods	Materials	Location	Time for Activity
1. Comparing the weight of pupils and the average weight of waste each of them produces in one year	Calculating and visualizing abstract figures	bathroom scale, calculator, current figures for local waste production	classroom	10 min
2. Guessing game: Composition of residential waste (statistics)	Self-reflection and visualization	100 marbles, 8 glasses, current statistics of the composition of residential waste	classroom	15 min
3. Matching game: raw material and the final product	Learning with playful character	laminated cards with photos of different raw materials and corresponding products (e.g. sand - glass, mineral oil - plastic)	classroom	5 min
4. Sociogram: Waste prevention and separation at school	Movement in the room, learning alternatives	prepared questions regarding the topic	classroom	10 min
5. First Association: Write down all things you can think of which are made of plastic in our everyday lives	Connotations, a reflection of everyday life	notes and pens	classroom	1 min
6. Research game about plastic waste facts finding the 3 fake news	Autonomous research, critical analysis of facts	laminated notes with facts about plastic waste including 3 fake news, laminated notes with background information	classroom	15 min
7. Matching game: degradation times of waste in the oceans	Reflection and learning with playful character	laminated cards with photos of different waste (e.g. a bottle of glass, a bottle of plastic	classroom	10 min
8. Geographical game: mark garbage patches in the world map	Reading maps, finding places	laminated world map, water-soluble pen, list of garbage patches in oceans worldwide	classroom	5 min
9. World Café: discussing questions written on paper tablecloth and writing down answers	Discussion in small groups	tables, paper tablecloths, pens in different colours, a prepared question for each table	classroom	20 min
10. Creating an exposition about fast fashion, sportswear and recycling, health problems regarding clothes made of synthetic fibres, upcycling ski in small groups and presenting a creative solution for each problem	Research work, creative work, presentation of problem and solution in front of the class	tables, facts related to topics, notes, pens, clothes, shoes, old skis (as material for exhibition)	classroom	45 minutes
11. Experiment: Filtering microplastics from cosmetic products	Experimental work, Research work, creative work, presentation of problem and solution in front of the class	Tea filters, cosmetics including microplastics (e.g. shower scrub, shampoo), washbasin, scissors, binocular, list of microplastics added to cosmetics	classroom	25 minutes

Activity description

This pilot activity deals with the connection between consumption and waste and local and global hazards of waste. The pupils should become aware of the tremendous amount of waste we produce in our daily lives.

Pupils gain knowledge about waste production, separation, prevention and recycling on the local and global level. Problems that are caused by the huge amount of waste are shown to the pupils.

They devote special attention to the waste problem in mountains (possibilities of waste separation and recycling in alpine space, long-term decomposition of waste in mountains). They deal with the risks and dangers associated with waste in alpine regions and in a global perspective. They also get to know the problems of fast fashion and synthetic fibres in clothes and think about possible solutions and plan a little exhibition by themselves. They present their innovative solutions to others. In another part, the pupils get active themselves again and upcycle old socks.

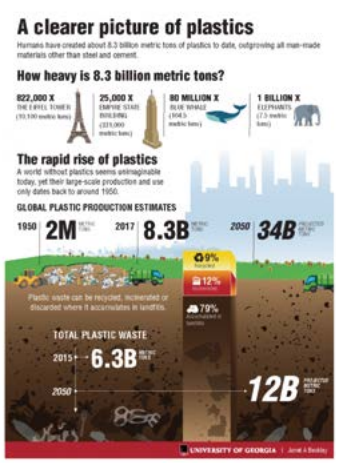
The pilot activity is composed of several activities and games (e.g. guessing game, matching game, geographical game, first association, sociogram,...), which present SD key issues to the pupils and foster easier visualization of statistical data and raise awareness about these issues. To illustrate the topic microplastics, the pupils filter microplastics from cosmetic products themselves. In this way, the topic becomes more apparent and easier to understand. They touch the microplastics and use magnifying glasses to observe it in detail.

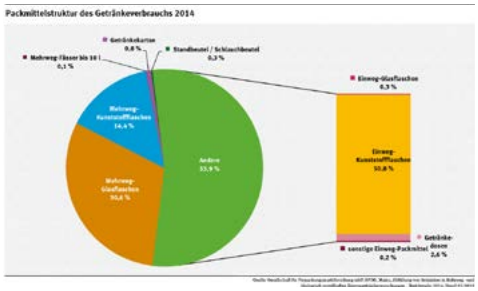
Outdoor activities
/

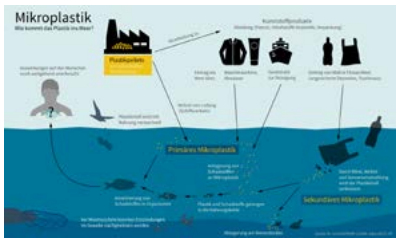
Tools and materials description
The whole range of activities, tools and materials, which are used in the pilot activity are described above in Unit of Learning structure (phases of the project/times/structure in activities.
Below there are only some examples of the tools and materials:

- Globe and world map – the pupils mark garbage patches into a world map

- The data (see below) is to be presented to the pupils with the use of laminated cards and with marbles and glasses
- Exhibition: old socks, shoes, skies, clothes ....
- Posters, pens, tables
- Experiment with microplastics: tea filters. Cosmetic products including microplastics, washbasin, scissors, binocular and list of microplastics, added to cosmetics:







Project STRATEGIES

Strategies, methods, techniques
or a better understanding of the first part of the activity, they used methods like visualization, learning through games, experiment ...
For carrying out of the activity they used enquiry-based learning:

- Identify the problem: How could we raise awareness about waste problems in the Alps?
- Observe and document elements, that contribute to the problem: Pupils learn about waste, the origin of the waste, health consequences, environment with the use of different interactive approaches: guessing game, matching game, sociograms, first associations ...
- Learn skills needed to address the problem: Work in groups – discussion about using recycling to raise awareness of people about the waste in the Alps (what and how to use them)
- Create a new solution using your skills, process and knowledge: Pupils prepare an exhibition, where they do recycling and upcycling to present issues with fast fashion, sportswear and recycling, potential health problems from wearing synthetic materials ... — raising awareness through creativity
- Share your solution with others: Pupils present their innovative solutions to the others

Cross-curricular strategies
The activity was carried out interdisciplinary connecting biology, geography, sociology, chemistry...

13. Excursion: Consumption-critical excursion through an alpine tourist spot using the example of Berchtesgaden - PS1

ASM Pillar: Environmental
Macro-issues: Natural resources exploitation and management
Key alpine SD Issue: Waste management - consumption

Excursion: Consumption-critical excursion through an alpine tourist spot using the example of Berchtesgaden

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Gymnasium Berchtesgaden
- Berchtesgaden National Park

SD VALUES

- Universalism: protecting the environment, see the beauty in the world, inner harmony, to be broadminded, social justice, equality;
- Benevolence: honesty, to be responsible;
- Conformity: self-discipline;
- Tradition: respect for tradition;
- Security: sense of belonging;
- Power: wealth, social power;
- Achievement: to be influential, successful;
- Hedonism: enjoying life, pleasure;
- Self-direction: creativity, choosing own goals, self-respect.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Globalization and environmental problems;
- Global production of consumer goods as food and clothes and its impacts;
- Need and motivation for consumption;
- Problems of high consumption;
- Sustainable consumption: labels for eco-textiles, fair trade products and organic food;
- Advantages of regional products focussing on food, clothes and typical souvenirs;
- Reflection of one's own consumption behaviour;
- Critically questioning of origin of products;
- Think about global consumption critically;
- Teamwork;
- Presentation and communication skills;
- Development of scientific thinking;
- Development of a questionnaire;
- Self-reflection of own behaviour;
- Open to other opinions and varying perspectives

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about globalization, environmental problem, global production of consumer goods, sustainable consumption; Evaluating possible impacts; Theory about the future and desirable future scenarios; create one's own vision of the future; foresee consequences of actions; Accept responsibility of actions and choices done;
- Normative: Concepts of justice (justice in global trade), equity, social-ecological integrity, Ethics; Gradually recognize the meaning and applicate norms and values underlying actions; Negotiate sustainability values, principles, goals and targets in a context of conflicts of interest, uncertain knowledge and contradictions; Be open to other opinions;
- Strategic: Be committed to integrity and ethics; Be open to varying perspectives; Be willing to act despite inconclusive or incomplete information;
- Collaboration: communication between each other, categorize different opinions; functional values regulation social cohesion in local communities; Teamwork; Collaborate and learn from others; Be able to motivate; Understand and respect the needs, perspectives and actions of others (empathy); Understand diversity especially those related to cultural and social aspects; Embrace diversity among cultures and social groups;
- Systems Thinking: Alpine key sustainability issue, the cause and consequences: waste; Relations between different causes: Actions, interests and mandates of key stakeholders in the problem constellation; Be able to think about the problem critically and globally; Think global act local;
- Self-Awareness: Know one's own role in the local community and society; Reflect one's own role in the local community and society; Evaluate actions, feelings and desires; Be active in environment; Deal with one's feelings and desires;
- Integrated Problem-Solving: Different problem-solving frameworks related to sustainability and develop viable solutions; Be able to think about a problem critically and globally; Apply problem-solving approaches and develop viable, equitable solutions; Deal with conflicts in a group; Be open to varying perspectives.

LEARNING GOAL/OUTCOMES

Unit of Learning structure (phases of the project/times/structure in activities)

Activity	Didactic methods	Materials	Location	Time for activity
1. Introduction to the topic "consumption"	Class discussion	Some facts and figures about local and global consumption, blackboard, chalk	Classroom	15 min
2. Developing questions for the survey in local stores	Teamwork in small groups (4 students, two times each focus	Fact sheets focusing on food, textiles and typical alpine souvenirs, paper, pen	Classroom	45 min
3. Geographic game: Where were my clothes produced?	Visualisation - reading world map and finding countries	laminated world map, water-soluble pen	Classroom	10 min
4. Matching game: Places and work steps during the production of jeans and a t-shirt (examples)	Reflection and learning with a playful character, visualization	laminated photos of different steps of jeans and t-shirt production, laminated world map, water-soluble pen	Classroom	20 min
5. A survey in local stores	Teamwork in small groups (4 students in each group)	map with marked store locations, questionnaires, pens, clipboards	Fieldwork	60 min (only survey; without way from school to stores and back)
6. Presentation of the survey results	Teamwork, presentation, discussion	posters, pens in various colours, blackboard, magnets	Classroom	75 min

Activity description

This pilot action is dedicated to sustainable consumption in which pupils learn about the needs and motivation for consumption and about the impacts of long chains between producers and final consumers of products (especially clothes, food, typical souvenirs). They deal with their own consumption behaviour and get awareness for global production of consumer goods. They question critically the origin of "alpine" products and get to know different labels for eco-textiles, fair trade products and organic food. In a preparatory lesson, they also develop their own survey and later they interview shop owners and assistants of local stores of Berchtesgaden. They created some posters with the most important findings of their survey and presented their results to the others.

Outdoor activities:

During the excursion through the centre of Berchtesgaden, the pupils used their questionnaire to interview shop owners and their assistants.

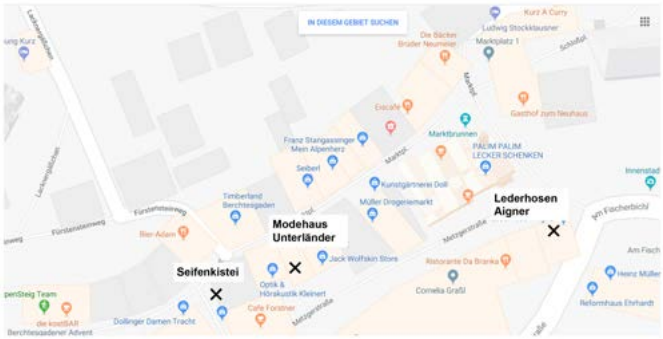
Tools and materials description

The whole range of activities, tools and materials, which are used in the pilot activity are described above in Unit of Learning structure (phases of the project/times/structure in activities)
Below there are only some examples of the tools and materials:

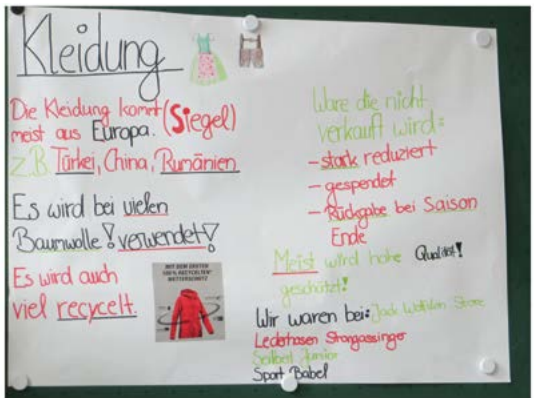
- Questionnaire prepared by pupils for interviewing local stores of Berchtesgaden

Keywords: Globalization; Cheap Fashion; Traditional clothing; Origin; Price; Material; Organic cotton; Synthetic fibre clothing; Internet competition; Second hand; traditional clothing (Leather trousers)

- Map with local stores



- Posters, pictures, pens, magnets - for the pupils' presentation



Project STRATEGIES

Strategies, methods, techniques

For carrying out of the activity they used enquiry-based learning:

- Identify the problem: Are we sustainable with regard to clothing, food, souvenirs?
- Observe and document elements, that contribute to the problem: Pupils learn about production phases and locations through different games
- Learn skills needed to address the problem: Preparing a questionnaire on clothing, food, typical souvenirs for interviewing shop owners and assistants of local stores
- Create a new solution using your skills, process and knowledge: Pupils question the local stores and analyse the answers in groups
- Share your solution with others: They design a poster that includes the results of their research and the possibilities for improving sustainability.

Cross-curricular strategies

The activity was carried out interdisciplinary connecting religion and ethics, geography, sociology...

14. Do we take care of our alpine environment? – Promotion of sustainable behaviour in a school environment - PS10-11

ASM Pillar: Socio-economic
Macro-issues: Sustainable and cohesive communities
Key alpine SD Issue: Cooperating and cohesive communities

Do we take care of our alpine environment? – Promotion of sustainable behaviour in a school environment

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Istituto di Istruzione Superiore Alberti Bormio
- Istituto Comprensivo Martino Anzi Bormio
- Stelvio National Park (non-formal)

SD VALUES

- Universalism: protecting the environment;
- Self-direction: independent, curious, creativity, choosing your own goals;
- Achievement: to be intelligent, to be capable of, to be successful;
- Security: a healthy lifestyle, sense of belonging;
- Tradition: respect for tradition;
- Benevolence: friendship, meaning in life, to be responsible;
- Commitment to sustainable development;
- The belief that people can make a difference.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Gain knowledge about key sustainable development issues in the Alps (environment, society, economy and governance) and can recognize them in their local environment;
- Understand the importance of a sustainable school environment;
- To be familiar with environmental legislation and recommendations for implementing sustainable measures in the local environment;
- Adopt the basics of research work: identify the problem, collect information, perform an experiment, analyse and evaluate the information;
- Develop digital, communication and presentational competences;
- Evaluate the information collected using different sources;
- Develop competence learning to learn: plan, implement and evaluate their own learning process;
- Develop the competence of teamwork, collaborative learning;
- Develop a sense of belonging to the Alpine space.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area future multiple scenarios-possible, probable and desirable; Time scales relevant to the problem and possible solutions; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones;
- Normative: Concepts of justice, equality, social-ecological integrity, and ethics; Gradually recognize the meaning and applicate norms and values underlying actions;
- Strategic: Be committed to integrity and ethics;
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Recognize and understand relationships and complex systems;
- Collaboration: Collaborate with others and learn from others; Understand diversity especially those related to cultural and social aspects;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Evaluate and further motivate actions, feelings and desires.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity **Didactic Methods** **Materials** **Location** **Time For Activity**

1. Gaining knowledge about key SD issues in the Alps and local environment Frontal lecture PowerPoint presentation, self-notes Istituti Alberti/Anzi Bormio 4h
2. Making of identification cards for the article about Statuto Valtellina Group work, working with sources Statuto Valtellina, identification keys, computer, notes Istituti Alberti/Anzi Bormio 20h
3. Presentation of selected articles of Statuto Valtellina Group work, working with sources Computer presentation, software dedicated Istituti Alberti/Anzi Bormio 10 min/group

4. Presentation of selected articles of Statuto Valtellina Group work, working with sources Computer presentation, software dedicated Istituti Alberti/Anzi Bormio 10 min/group
5. Preparation about a questionnaire about the environment: a questionnaire about the relation and care of our environment Dedicated software to prepare the questionnaire and data analysis Computer presentation, software dedicated Istituti Alberti/Anzi Bormio 10h

Activity description

Student of Istituto di Instruzione Superiore Alberti spent their pilot action in the classroom where they were learning about key SD issues in the Alpine region with special emphasis on cases in the local environment and the Statute of Valtellina community, which consists of operational guidelines and monitoring tools. For easier understanding, students prepared identification cards with examples.

Pupils made online closed-question questionnaires (QuestBase software) for their peers, teachers and other school staff in order to evaluate the state of the art and determine the opportunities for further development of sustainable policies. Pupils processed the retrieved data and made statistical analysis (transformations of data in "true" and "false" events, arithmetic mean and standard deviation, data histograms and their interpretation through the study of Gaussian curve, comparison of the results, preparation of detailed report with the results and the evaluation of statistical errors). Questionnaire analysis was the foundation for further pilot actions where proposals for a more sustainable school environment will be put into practice. The students also presented younger pupils from the primary school Instituto Comprensivo "Martino Anzi" the necessity for a more sustainable school and also invited them to fill in the questionnaire.
Collected measures to make the school environment more sustainable where the measures will be implemented gradually in the next few school years, while teachers will be cooperating in the cross-curricular implementation of measures and will be related to the national curricula

Outdoor activities

Pupils and teachers visited the school in Silandro (Alto Adige) - Trentino as an example of good practice. They paid attention to sustainable practices, which were introduced as part of the experimental mountain curriculum.

Tools and materials description

Lecture in the classroom:

- PowerPoint presentation (Prezi) and self-notes, QuestBase software for a digital questionnaire

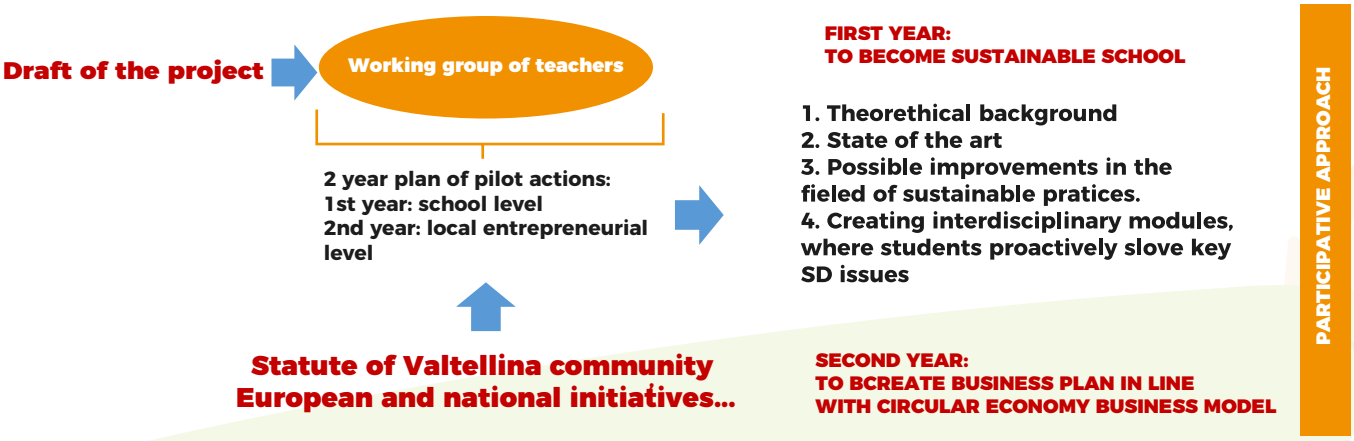
Individual work:

- Computer, notes, underline key questions to ping specific answers, List of the selected questions relating to the choice of eco-friendly material and clean energy

Project STRATEGIES

Strategies, methods, techniques

The pilot site decided to implement a two-year plan of pilot activities, where they move from the school environment to the local one:



Inquiry-based learning:

1. Introduction activity (Group work, working with various sources, peer to peer learning)
Students gain knowledge about the Statute of Valtellina community:

- preparation of identification cards (with the use of identification keys)
- presentation of selected articles – create presentations

2. Preparation activities - research work:
Students prepare a questionnaire about school sustainability practices and opportunity for their improvements from the viewpoint of an individual (what about my behaviour...). They use QuestBase software to produce an online questionnaire. In the process of preparation of questionnaire, students have to use existing knowledge because they have to prepare a pool of closed, but significant answers They define the target group and the type of questions
They also made an experiment with the pilot sample to test the effectiveness of prepared questionnaires.

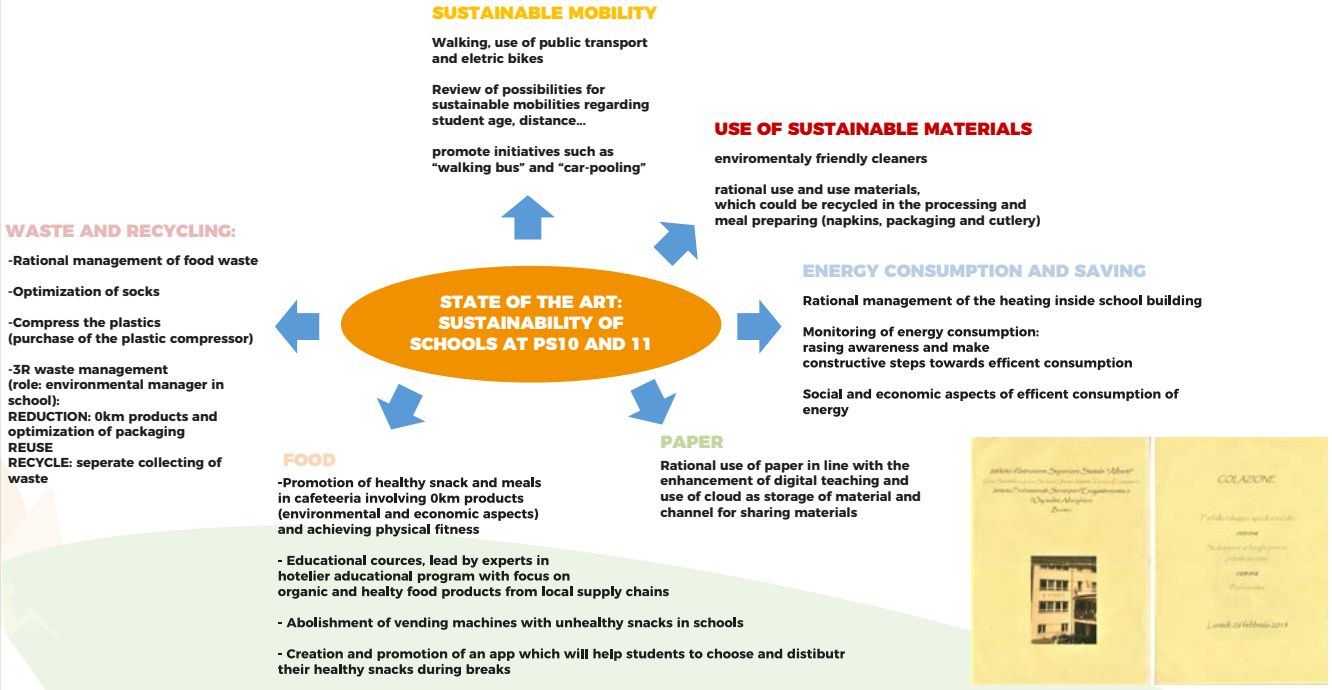
3. Practical work
Individual work: Filling in the questionnaire
Peer to peer learning: Students have to motivate younger students for sustainable behaviour: filling in the questionnaire
A scientific approach to research: Collecting and processing data, producing statistical analysis in order to identify the strengths and weaknesses of current sustainable practices and opportunities for their improvements.

4. Evaluation, which includes strongly participative approach

5. Presentations
The bottom-up approach, used in this action, allow teachers to modify and internalize the interdisciplinary modules, which will become the nucleus of the ASM curriculum

Cross-curricular strategies

Cross-curricular: From existing sustainability proposals, new cross-curricular links will be created with regard to the topics. In order to implement the measure in the future, teachers of individual subjects will cooperate. The food-related outcome was a menu consisting of traditional dishes from locally produced ingredients and prepared with modern food-processing techniques.

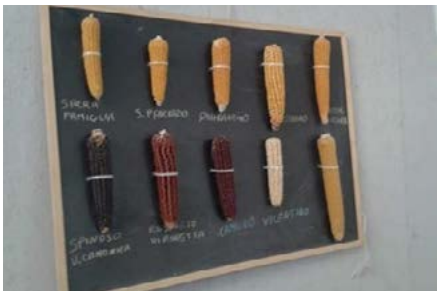


15. From field to the kitchen – rediscovering plants, crops and flowers of the mountain area in Clusone - PS7

ASM Pillar: Environmental
Macro-issues: Cultural and Agro-managed landscape conservation
Key alpine SD Issue: Farming

From field to the kitchen – rediscovering plants, crops and flowers of the mountain area in Clusone

Photo gallery



FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Azienda Bergamasca Formazione/CFP Clusone
- Parco delle Orobie Bergamasche (Expertise such as naturalist and mountain guide as non-formal)
- Andrea Messa (expert in cereals as a non-formal educator)
- Marco Del Bono (expert in beer productions as a non-formal educator)
- Luca Giupponi (expert in mountain's flowers and flora alpine as a non-formal educator)
- Vanessa Vaio (expert in plants and projects of revaluing places and heritage as a non-formal educator)
- ERSAF (expert in the conservation of biodiversity as a non-formal educator)

SD VALUES

- Universalism: protecting the environment, to be unified with nature
- Self-direction: curiosity, creativity, choosing your own goals
- Stimulation: variation in life
- Achievement: to be intelligent, to be successful, to be capable of ...
- Security: a healthy lifestyle
- Tradition: respect for tradition, devout
- Benevolence: true friendship, to find meaning in life, responsibility
- Sense of identity
- Commitment to sustainable development
- The belief that people can make a difference

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Knows the name of alpine flowers, plants;
- Knows the adaptations of alpine flora on alpine environment;
- Can recreate the living environment - making a garden/park with alpine plants;
- Knows the conservational law and the endangered alpine species of plants and chooses plants for the garden/park in accordance with respecting local laws and preserving local biodiversity;
- Making a herbarium with alpine plants;
- Understands the importance of local varieties of vegetables, maize for maintaining a high level of biodiversity;
- Is open to different approaches to biodiversity conservation;
- Is ready to actively approach local biodiversity conservation - create a gene bank of vegetable varieties and maize (collection of seeds, seedlings and their analysis, field experiment - determine germination percentage, planting, growth and development, description of plants and their properties, local varieties - conservation techniques);
- Recognizes seeds of different vegetable and crop plants;
- Understands the specificities of the cultivation process in the alpine environment;
- Understands the problems of seed production - the cultivation of seeds for the purpose of dissemination and can act in accordance with the principles of good practice;
- Knows and performs the process of making flour from corn seeds (rubbing, cleaning, milling, packing, labelling);
- Recognizes different types of flour;
- Collects recipes for flour dishes and prepares them (biscuits, polenta ...);
- Can use a small stone mill, sieves;

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Analysis approaches; Time scales relevant to the problem and possible solutions;
- Collaboration: Collaborate with others and learn from others; Embrace diversity among cultures and social groups;
- System Thinking: Alpine key sustainability issues, their causes and consequences; Recognize and understand relationships in complex systems; Think Global act Local;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Apply the precautionary principle; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Reflect on its own values and personal behaviours; Be active in environment;
- Integrated Problem-Solving: Think about a problem critically; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity- inquiry-based learning Didactic Methods Materials Location Time For Activity

1. Preparation of pilot activities and modules about biodiversity connected to alpine plants, local varieties of vegetables and corn Introductory activity Book and Video Sheets and Pen CFP Clusone 1h
2. Getting to know alpine plants, foraging them for the task later - making an alpine garden/ park and producing a herbarium Outdoor Activity Plastic Bag, Scissors and Felt Pencil CFP Clusone 5h
3. Chemical analysis of local corn varieties - seeds Laboratory Activities Microscope Balance CFP Clusone 5h
4. Field experiment of planting seeds of local corn varieties and seeds and seedlings of local vegetable varieties (acquired by pupils from local people) - first attempt to test the germination percentage Outdoor Activities Seeds off local varieties of corn, vegetable seeds and seedlings CFP Clusone 10h
5. Practical work - plant growth and development Field gardening tools CFP Clusone 10h
6. Students gain an insight into the process of flour production from the field to the table - rubbing, cleaning, milling, packing and labelling Laboratory Machines for rubbing, cleaning, milling, packaging and labelling CFP Clusone 30h
7. Preparation of dishes from flour and collection of recipes for making a cookbook Kitchen, Laboratory Kitchen Tools CFP Clusone 20h

Activity description

Pupils of ABF/CFP Clusone were discovering their territory through various activities. They were learning about the biodiversity of alpine plants and prepared herbarium of Alpine plants. They made a thematic garden, where they planted typical Alpine plants in line with conservation regulations.

Students established a seed bank from the collected seeds of crops and vegetables from the elderly in their local environment. Students collected different varieties of grains, made their chemical analysis and grew them in the school vegetable garden. They also determined the germination rates and learnt about the whole process from the field to the kitchen: the cultivation of seeds, observation of growth, harvesting and hulling, milling, packing and labelling. Finally, students collected the recipes, where flour was one of the main ingredients and prepared some of the dishes (biscuits, polenta) in the school kitchen.

Outdoor activities

- Getting to know alpine plants, foraging them for the task later - making an alpine garden/park and producing a herbarium
- Practical work: Field experiment of planting seeds of local corn varieties and seeds and seedlings of local vegetable varieties (acquired by pupils from local people) - first attempt to test the germination percentage

Tools and materials description

- camera, notes, pencils, sketchbooks
- equipment for work in the: garden, laboratory and kitchen

DESCRIPTION

Strategies, methods, techniques

The process of work with students is very easy and based learning on doing. We experience work in small groups with tasks and activities divided according to the degree of difficulty and the different levels of learning and to do this we use SELF EVALUATION, FLIPPED CLASSROOM, OUTDOOR EDUCATION, and COOPERATIVE LEARNING.

Inquiry-based learning:

a. Preparation phase: Define actions and plan a module about biodiversity in their local environment - local varieties of field crops)

b. Observe elements that contribute to the problem: Module about biodiversity in their local environment:

- gain knowledge about alpine plants and their adaptations, endangered species and nature protection legislation
- importance of biodiversity of local crops and vegetable varieties, identification of seeds of individual varieties of crops and vegetables, methods of conserving local varieties

c. Solve the problem:

- planning and carrying out the process of collecting seeds seedlings of local crops and vegetables varieties
- practical work: chemical analysis of the collected seeds, carrying out the experiment with germination of the seeds, monitoring the process of growth and development - carrying out all the tasks related to better growth and development of plants (removing weeds, watering), observation and inventory of all properties
- preparing flour packages from the field to the table: rubbing, cleaning, milling, packaging and labelling
- preparing dishes from flour (polenta, biscuits) and writing a cookbook

d. Share your ideas/solution with others (or maybe the evaluation process):
preparing a table with all the ideas and solutions and cross the data, create a presentation to share on our website

Inquiry-based learning with the participative approach: raising awareness within a local community about the alpine plants and their biodiversity

- Preparation phase: Teacher and experts discuss possible local SD issues: how to raise awareness of Alpine plants among students within the local community
- Introduction phase: Teacher and experts present the selected issue to the class
- Learning phase: Students gain knowledge in the classroom and in the field on Alpine plants, their adaptations to extreme climate conditions and their status of protection. Students also make herbarium of Alpine plants.
- Problem-solving phase:
- Students created the mountain park in one of the public areas, managed by Local Governance of Clusone. Teachers and non-formal educators motivated students and guided them with instructions, hints ...
- Evaluation and dissemination:

The four general categories of criteria that were used to evaluate student work depending on the targeted standards or outcomes and the purpose of the performance task are four criterion types focus on evaluating: content, process, quality, and impact. Let's consider each type.

- Content criteria are used to evaluate the degree of a student's knowledge and understanding of facts, concepts and principles.
- Process criteria are used to evaluate the proficiency level of performance of a skill or process, as well as the effectiveness of the methods and procedures used in a task.
- Quality criteria are used to evaluate the overall quality and craftsmanship of a product or performance.
- Impact criteria are used to evaluate the overall results or effects of a product or performance given its purpose and audience.

Cross-curricular strategies

The activities were planned interdisciplinary so the cross-curricular approach was essential when carrying out the pilot action: OAM (Marketing), Science, Dairy Production, Cultivation, Chemistry, Math, Geography and History.

This pilot action is part of the UDA project - educational interdisciplinary module project that is implemented once a week, 50 hours per year. The result of the research is evaluated inside the curricula and it is important for the success at school.

For example, OAM teacher gives a task on collecting data of prices of milk and makes a business plan as a result of its UDA, Dairy Products teacher gives a task to create a perfect cheese with the ingredients and dairy products we have at school and makes experiments with saffron, to make the good balance of flavours. At the end divided into groups, every student is evaluated for his/her task and goal and has to explain his/her role in the process.

16. Agriculture in the hilly countryside of Bohinj - PS14

ASM Pillar: Socio-economic
Macro-issues: Towards a green alpine economy
Key alpine SD Issue: Sustainable rural development – Multifunctional and sustainable agriculture, Food production

Agriculture in the hilly countryside of Bohinj

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo (BC Naklo)
- Triglav National Park (TNP)
- The tourist farm Pr' Odolnek
- Bohinj Tourist Association

SD VALUES

- Universalism: to protect the environment, to be unified with nature, to be broadminded;
- Self-direction: freedom, curiosity, choosing your own goals, to be independent;
- Achievement: to be intelligent, successful, new capabilities;
- Security: a healthy lifestyle, family security, a sense of belonging;
- Conformity: self-discipline, respect for the elders;
- Tradition: respect for tradition, devotion;
- Benevolence: responsibility, helpful, to find the meaning in life.

Formal competences (knowledge, skills, attitudes)

- Understands the importance of the protected areas (the example of TNP);
- Understands the importance of the sustainable farming and sustainable use of natural resources;
- Understands the challenges of mountain farms in the protected area;
- Knows the valuable natural and cultural features of the protected area (the example of TNP);
- Is familiar with the agricultural and environmental legislation;
- Is familiar with agriculture in Slovenia: the past, present, and future;
- Is familiar with basic rules of conduct in the protected area (on the example of TNP);
- Is familiar with the quality label of the TNP (the "bohinjsko" label);
- Understands the principles of sustainable exploitation of natural resources (water, soil, wood);
- Can anticipate the negative consequences of the excessive exploitation of natural resources (water, soil, wood);
- Is able to link knowledge about different sectors – sustainable farming, husbandry, dairy, forestry, agricultural land management, tourism, farm tourism, eco-farming, etc.;
- To develop entrepreneurial thinking;
- Developing presentation and communication skills.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible information - possible, probable and desirable; Create one's own vision for the future;
- Normative: EU, national and regional regulations, funds, resources and opportunities for development;
- Strategic: Use learner-centred methods for designing, implementing and adapting SD actions in the local communities;
- Collaboration: Understand and respect the needs, perspectives and actions of others;
- System thinking: Alpine key sustainability issues, their causes and consequences; Think Global, act Local;
- Self-Awareness: Be aware of its own role in the local community; Evaluate and further motivate actions, feelings and desires;
- Integrated-problem solving: Think about a problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity **Didactic methods** **Materials** **Location** **Time for activity**

Project days - the first day

1. Visiting the Alpine Diary farming museum Learning by observing – visiting a museum Notes and camera Stara fužina, Bohinj 2 hours
2. Visiting the tourist farm Pr' Odolnek that has cheese production facilities Learning by observing, tasting cheese (use all senses), interview of the owners, discussion about agricultural policy and land development programme Studor, Bohinj 2 hours
3. Getting to know the cultural countryside of Bohinj Learning by observing Koprivnik – Podjelje, Bohinj 2 hours
4. Visiting the tourist mountain eco-farm Gorjup Learning by observing, tasting of various dried meat products (use all senses), discussion about organic farming, challenges of mountain farms in the protected area, and quality label of the TNP (the "bohinjsko" label) Podjelje, Bohinj 2 hours

Project days – the second day

5. Preparing presentations of topics discussed during the first project day and presenting them Working in small groups, using various sources Computer, using various sources Classroom 6 hours
6. Writing a paper: Similarities and differences between students' farms and visited farms – past and present Individual work, using various sources, intergenerational cooperation Computer, using various sources (historical data) Working from home 5 hours

Activity description

One of the two main objectives of this pilot action was learning about agriculture in the past and the present. Students learnt about the past in Alpine dairy farming museum in Stara Fužina, Bohinj. Rich and diverse permanent display offers an insight into the history of agriculture and in a life of shepherds in the Bohinj's (mountain) pastures in an authentic environment.

The second objective was learning about the characteristics of agriculture in Bohinj - especially in the part that lies within the protected area of the TNP. That part is a typical Alpine region with little cultivated land, where mountain pastoralism was and is still prevailing agricultural activity.

Agriculture in Bohinj is nowadays closely intertwined with tourism and students learnt this first-hand on two practical examples. The first visit was at the tourist farm Pr' Odolnek with cheese production facilities. Group proceeded its field trip on foot and during the walk, students were observing valley and hilly countryside, immovable cultural heritage, linked to the agricultural activity in the past, and the remains of the traditional use of agricultural land that persist through time.

In the settlement Podjelje, students visited the tourist mountain eco-farm Gorjup. The self-sufficient farm is an example of a good practice where they practice so-called "green and sustainable tourism", which is very suitable for the Alpine protected area.

During the next day, students (divided to small groups) used various sources to research topics such as: agricultural and environmental legislation, agriculture in Slovenia - the past, present, and future, sustainable farming, husbandry, dairy, forestry, agricultural land management, tourism, farm tourism, eco-farming, sustainable use of natural resources and negative consequences of the excessive exploitation of the natural resources (water, soil, wood), challenges of mountain farms in the protected area, and quality label of the TNP (the "bohinjsko" label).

During History class, they were comparing farms in past and present as well as searched for similarities and differences between their farms and the farms they visited on the first project day.

Outdoor activities

- Students spent the first project day in the field where they learned by observing, use of different senses ...

Tools and materials description

Computers, the use of various sources – it is necessary to mention the use of oral sources since the history of farms is mostly transmitted orally from generation to generation – intergenerational cooperation.

Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning:

- Introduction to a problem: COMPARING ALPINE FARMS IN THE PAST AND PRESENT
- Learning with observing – students visit several examples of good practices of ecological farms in the Alpine areas that produce traditional dairy and dry-meat products, and have a tourism activity.
- Students use various sources for researching – gaining practical knowledge.
- Students write papers where they use practical knowledge gained during the project days. They learn about the history of their farm by asking their family members – intergenerational cooperation and use the information to compare opportunities for farms in the alpine areas in the past and present.

Students prepared a reportage about the trip.

Cross-curricular strategies

BC Naklo carries out project days twice per year, where students through project work gain additional knowledge. In this pilot action, there was cross-curricular cooperation of History (comparison of farms in the Alpine world in the past and present) and the Slovenian language (report, interview, presentation).

17. Opportunities for youth in the Alps with the activity from indigenous Bruna alpina/Bruna Italiana cow to cheese Bernardo, where students rediscover traditional cheese recipe from the mountain area in Clusone - PS7

ASM Pillar: Environmental, Socio-economic
Macro-issues: Cultural and Agro-managed landscape conservation, Towards a green alpine economy
Key alpine SD Issue: Farming - Breeding, Sustainable rural development - Multifunctional and sustainable agriculture, food production

Opportunities for youth in the Alps with the activity from indigenous Bruna alpina/Bruna Italiana cow to cheese Bernardo, where students rediscover traditional cheese recipe from the mountain area in Clusone

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Azienda Bergamasca Formazione/CFP Clusone
- Parco delle Orobie Bergamasche (Different experts as non-formal educators: biologist, climatologist, geologist and nature lovers)
- Andrea Messa (non- formal educator, expert in cereals and animal feeding)
- Giancarlo Poloni (non-formal educator, expert in saffron cultivation)
- Giacomo Perletti (non-formal educator, expert in cheese and dairy products)
- Daniele Negroni (non-formal educator, expert in breeding and bruna alpina)

SD VALUES

- Universalism: Protecting the environment;
- Self – direction: curiosity, creativity, choose your own goals;
- Achievement: to be intelligent, to be successful;
- Security: a healthy lifestyle, a sense of belonging;
- Tradition: respect for tradition;
- Benevolence: friendship, to be responsible;
- The sense of identity;
- Commitment to sustainable development;
- The belief that people can make difference.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Knows the indigenous breed of cow Bruna Italiana/ Bruna Alpina, its characteristics (optimal ratio between quality and quantity of produced milk), conservation measures (breeding programs and goals);
- Knows the chemical and biological characteristics of milk and analytic techniques;
- Understands that the unique chemical composition of Bruna Italiana cow milk contributes to the quality of dairy products, particularly cheese;
- Understands the advantages and disadvantages of cow breeding in mountain pastures;
- Knows plants that grow on pastures;
- Knows the differences in the production of cheese in high and low altitudes;
- Knows Bernardo cheese - its properties and production techniques (the process of ripening, refining of the taste with spices);
- Analysing the chemical and biological properties of milk;
- Use of a microscope;
- Knows how to make Bernardo cheese by the traditional recipe (and also other traditional cheeses);
- Knows how to add additives - spices to cheese (saffron: the process of planting bulbs, growth, the collection of flowers, drying, grinding);
- Collecting recipes of dishes that include Bernardo cheese as an ingredient.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Analysis approaches; Time scales relevant to the problem and possible solutions;
- Collaboration: Collaborate with others and learn from others; Embrace diversity among cultures and social groups;
- System Thinking: Alpine key sustainability issues, their causes and consequences; Recognize and understand relationships in complex systems; Think Global act Local;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Apply the precautionary principle; Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Reflect on its own values and personal bias; Be active in environment;
- Integrated Problem-Solving: Think about a problem critically; Be open to varying perspectives;

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods - inquiry-based learning Materials Location Time For Activity

1. Preparation of Activities and Modules about Mountain Cows and Farming Book and Video Sheets and Pen CFP Clusone 1h
2. Research of Biodiversity outside School by Foraging And Analyse plants that grow on pastures Foraging/Outdoor Activity Plastic Bag, Scissors and Felt Pencil CFP Clusone 5h
3. Chemical and biological analysis of Milk Laboratory Activities Microscope Balance CFP Clusone 5h
4. Field experiment: Determination of the rate of saffron germination Outdoor Activities Seeds of Ancient Varieties of Corn and rye CFP Clusone 10h
5. Working Outside the Field - growth and development of saffron plants Outdoor Activities Hoe and Scoop CFP Clusone 10h
6. Cleaning, drying, grinding of Saffron Flowers Laboratory Activities Cleaning Machine CFP Clusone 5h
7. Making Cheese Products Laboratory Activities Milling Machine CFP Clusone 5h
8. Label Cheese and Dairy Products Laboratory Activities Packaging Machine CFP Clusone 10h
9. Making Dishes and Recreate Recipes using cheese as raw material. In the end, they produce a cookbook - Created by Students for other Students Kitchen, Laboratory Activities Kitchen Tools CFP Clusone 20h

Activity description

Students familiarized themselves with the indigenous Bruna Alpina/Bruna Italiana cow breed and its unique qualities and learned about breeding programs. Students collected plants on Alpine meadows and pastures that make up the diet of the cows and identified them. Students made an analysis of chemical and biological characteristics of milk. In addition, cultivation of saffron was an extensive part of their activities. Students planted saffron bulbs and monitored their growth. At harvest, they cleaned and milled the flowers. Saffron has become one of the main ingredients of the Bernardo cheese students learnt to produce. Later on in the kitchen, students prepared dishes containing saffron cheese. In the end, students created a cookbook, where they collected traditional recipes. Bernardo cheese produced by students and other dairy products were presented on local events, fair of pasture and breeding (Latteria Val di Scalve, Rifugio Cassinelli), other promotional events.

Possible expansion of the activity: Expand the set of crops and create a complete meal with the produced ingredients.

Outdoor activities

- Research of Biodiversity of plants growing on mountain pasture
- Practical fieldwork: determining the germination percentage, monitoring of growth and development, harvesting flowers

Tools and materials description

Camera, notes, pencils, sketchbooks

Equipment for work in the: field, dairy workshop, and kitchen

Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning: Producing with Bernardo cheese

a. Preparation phase: What is Bernardo cheese – surveying elderly people, youth (intergenerational cooperation) ... interviews and data elaboration

b. Observing elements that contribute to the problem: VET module about Mountain Cows and Farming

c. Solving the problem: get familiar with the whole process from the field to the kitchen (learning by doing, practical work)

- Analysing plants on Alpine meadows and pastures – collecting samples and identifying plants
- Laboratory work: Analysing chemical and biological characteristics of milk
- Cultivation of saffron and its preparation: from bulbs to picking flowers, cleaning flowers, milling and drying
- Producing and packaging Bernardo cheese.
- Preparing traditional meals, dishes, where cheese is one of the ingredients. In the end, they
- created a cookbook with traditional recipes.
- Analysing economic factors of production

d. Sharing ideas/solution with others: Presentation of Bernardo cheese and the production technique at local events, fair of pasture and breeding and other promotional events, and in articles

The action also contained elements of experiential learning, as students handled a realistic situation in which a farmer does all the planning for his product, from the field/pasture to the store.



Four general criteria categories used for evaluation of student work depending on the targeted standards or outcomes and the purpose of the performance task are four criterion types focus on evaluating: content, process, quality, and impact.

- Content criteria - used to evaluate the degree of a student's knowledge and understanding of facts, concepts and principles.
- Process criteria - used to evaluate the proficiency level of performance of a skill or process, as well as the effectiveness of the methods and procedures used in a task.
- Quality criteria - used to evaluate the overall quality and craftsmanship of a product or performance.
- Impact criteria - used to evaluate the overall results, effects of a product or performance given its purpose and audience.
- Pedagogic methods - the process of work with students is very easy and based learning on doing.
  We experience work in small groups with tasks and activities divided according to the degree of difficulty and the different levels of learning and to do this we use SELF EVALUATION, FLIPPED CLASSROOM, OUTDOOR EDUCATION, and COOPERATIVE LEARNING.

Cross-curricular strategies

The activities were planned interdisciplinary so the cross-curricular approach was essential when carrying out the pilot action.

OAM (Marketing), Science, Dairy Production, Cultivation, Chemistry, Math, Geography and History.

18. Impact of Tourism on Wild Alpine Fauna - PS4

ASM Pillar: Socio-economic, Environmental
Macro-issues: Towards a green alpine economy, Nature protection
Key alpine SD Issue: Tourism sector, Degraded habitats, preservations and restoration

Impact of Tourism on Wild Alpine Fauna

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- College Andre Corbet Samoëns
- Natural Reserve Sixt-Passy

SD VALUES

- Universalism: Protecting the environment, unity with nature;
- Benevolence: Responsibility;
- Conformity: Self-discipline;
- Security: a healthy lifestyle;
- Self-direction: curiosity, self-respect.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Understanding the concept of interdependence between the individual and the environment;
- Promote the ability to read the human activities impacts on ecosystems;
- Provide tools and models to actively participate in nature conservation;
- Provide tools for species recognition and classification.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- System thinking: recognize and understand relationships in complex systems;
- Self-awareness: be aware of its own role in the local community and society; Be active in environment;
- Integrated problem solving: Think about a problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

	Activity	Didactic methods	Materials	Location	Time for activity
1.	Presentation of the protected area and wild fauna during the winter	Slideshow in a classroom (introductory activity) carried out by the teacher and the educator from the park	PowerPoint presentation, papers, pencil	Classroom	2 hours
2.	Activities in the field seeking animal's tracks, observing some species (dear, ibex,...) discover adaptations to the winter environment	Discovering animals tracks - interpretation on the base of observation Observation of Ibex and chamois with telescope	Telescope	Fieldwork - Giffre valley	1 day
3.	Snowshoeing in Giffre valley. Learning about the historical and present-day activities in the local environment. Realize the technology and leisure activities affect the nature and alter it.	Learning through observing the anthropogenic impact, especially on tourism Retrospective learning - learning from past events	Snowshoes Winter sport equipment	Fieldwork - Giffre valley	
4.	Feedback in class and discussion about the rules of the protected areas and reasons behind them.	Discussion with ski patrollers Visualisation - draw pictogram of human activities in protected areas	Notebook Pencil	Classroom	2 hours

Activity description

The pilot action was carried out in the Giffre valley, an area where pristine nature and wildlife are negatively impacted by human activities, such as tourism, skiing and other leisure activities. Students tried to find sustainable solutions for mass tourism, what will contribute to the higher level of human safety and survival of the animals. Students talked about the tourist infrastructure and its possible socio-economic consequences, which would also affect students' lives like increasing prices of properties, seasonal jobs, etc. One of the aims of the pilot action was to present the impacts of winter tourism activities on Alpine animals (deer, chamois, ibex, and members of the Phasianidae family) to students. Students learnt about the animals' lifestyle adaptations, observed the animals and their tracks, and tried to interpret what the shape of their tracks tells about the animal's lifestyle. Students discussed the effects of human activities on mountain fauna and consequent strategies of animals to limit disturbances and competition. In addition, part of the activities was dedicated to avalanches and understanding the causes for avalanches and their frequency on slopes with/without trees. In order to understand the theory better, students made a miniature avalanche model and tested possible scenarios. Students also acquired practical knowledge on how to react in case of avalanches.

Outdoor activities

- Activities in the field seeking animal tracks, observing some species (dear, ibex...) and figuring out how they adapt to the environment in which they live. Discovering animal tracks and observing Ibex and chamois with a telescope
- Snowshoeing in Giffre valley and observing the nature and effects of winter and summer tourism.

Tools and materials description

- PowerPoint presentation, papers, pencil
- Telescope for observing animals
- Snowshoes
- Winter sport equipment.

Tools and materials description

- PowerPoint presentation, papers, pencil
- Telescope for observing animals
- Snowshoes
- Winter sport equipment.

Project STRATEGIES

Strategies, methods, techniques

Learner-centred methodologies:

- Introductory activity: audio-video presentation about alpine animals and their winter adaptation followed by a discussion.
- Interpretation of nature on the base of observation:

interpret what a track's shape indicates about an animal's lifestyle: small pillows indicate that animal has to be quiet for hunting, hoofs enable it to start running very quickly when the animal is being attacked

- interpret what eye position indicates if the animal is carnivore or herbivore
- Retrospective learning - learning from past events: Interpretation of a monument commemorating a natural disaster which destroyed a small village (storytelling: an old legend about a natural disaster)
- Experiential learning - learning with the use of miniature model: the probability of landslides and more in-depth learning about deforestation of slopes their effect
- Learning with observation: observing human infrastructure in the field - ski tracks, hydroelectric dam, protected areas and reflecting on the economic choices and their impacts.
- Visualisation - express yourself through art: draw pictograms of human activities in the protected areas in groups of 2-3 students and explain its restrictions and the reason behind them. This group work is a base for discussion.

Cross-curricular strategies

An interdisciplinary approach to the presentation of human activities (also tourism) was used in this campaign.

A cross-curricular approach was not used since the school faces a small number of pupils and teachers who are simultaneously learning at several schools, which makes communication and cross-curricular approach hard to implement.

19. Digital Path created by Pupils for Pupils - PS4

ASM Pillar: Socio-economic
Macro-issues: Towards a green alpine economy
Key alpine SD Issue: ICT development, Tourism sector

Digital Path created by Pupils for Pupils




FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- College Andre Corbet Samoëns
- Natural Reserve Sixt-Passy

SD VALUES

- Universalism: to protect nature, to be unified with nature;
- Self-direction: curiosity, creativity, new capabilities;
- Conformity: self-discipline;
- Tradition: respect for tradition;
- Security: Sense of belonging;
- Benevolence: responsibility;
- Power: Social recognition.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Be able to apply participatory methods for collaborating with diverse Stakeholders;
- Be able to reflect on one's own role in the local community and (global) society;
- Promote the ability to read the human activities impacts on ecosystems;
- Understanding the concept of the environment as an integrated system of relationships;
- Create a sense of belonging to the territory.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Self-awareness: Be active in environment;
- Collaboration: Collaborate with others and learn from others; Learning how to use participative and cooperative methods; Provide tools and models to actively participate in nature conservation;
- Integrated problem solving: Understanding the concept of the environment as an integrated system of relationships.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic methods - inquiry-based learning Materials Location Time for activity

1. Presentation in class about the project and the site "Cirque du Fer à Cheval" (history, natural environment, potential topics) Introductory activity: Slideshow in the classroom Discovering the potential topics PowerPoint presentation, papers, pencil Classroom 2h
2. 2. Students spend one day in discovering a protected area and gaining new ideas Start determining a path and capture some materials (photo, video, interview...) Learning by observing. Practical work - observing through photographic lenses: taking photos and videos Camera Notebook Pencil Fieldwork - "Cirque du Fer à Cheval" 1 day
3. Building a 3D model of a path in the "Cirque du Fer à Cheval" Technical creative work: Building a 3D model of territory for creating learning path (use of taken media material). Craft supplies Classroom 5h
4. Discussion:

- students present their models to classmates
- students discuss methods, used for learning through games (Treasure hunt, police investigation...), which were suitable to use for building the digital path
- testing of the application to discover possibilities. Presentation competence, peer to peer learning, learning through games Mobile application Classroom 5h

5. Pupils create a trailer to present digital path Camera, computer Classroom 5h

Activity description

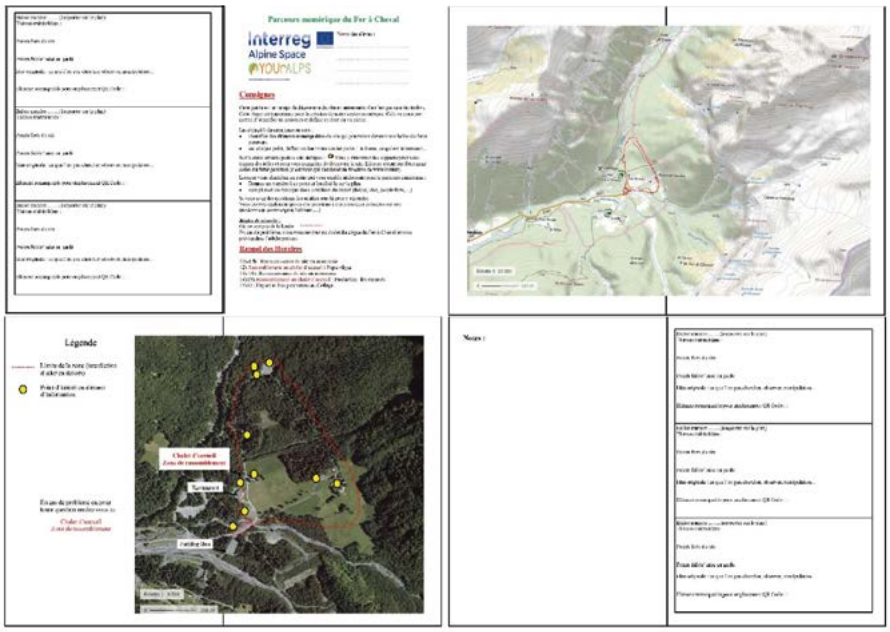
The site "Cirque du Fer à Cheval" is a very famous Alpine natural heritage with cirque glaciers, which is partly conserved by the protected area. The annual visit of the place is around 200 000 tourists and among them, there is also a lot of youth, especially during spring and summer months. Students were invited to create a digital path with the aim to present the place from environmental and cultural aspects to their peers - peer to peer learning. Students first gained the knowledge about historical, environmental and cultural values of the site. Students researched the ICT's possibilities (photos, videos, tracking sounds, games ...) to tackle the task. Students went in the field to explore and envision a learning path with learning points. Students collected some materials, needed for preparation of the digital map of the path (photos, videos, interviews, soundtracks ...). Students created 3D models of their path from different materials based on their exploring on site and prepared materials. Currently, the students create a draft of a path (a trailer) and the final version of the application will be finished next year.

Outdoor activities

- Students spent a day discovering the site Cirque du Fer à Cheval. They were also collecting material (photos, videos) which they used for the 3D model design.

Tools and materials description

- PowerPoint presentation in the classroom (joint doc)
- The document that each group of pupils have on the field to determinate a possible path and interpretation' potentials.



- Mobile application testing

a. Building 3D models of a path




Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning:

- Introduction of the problem: to create a digital path for visiting, which will enable peer to peer learning
- Students receive theoretical knowledge, which is needed for problem-solving (presentation - PPT):
  students gain knowledge about historical, environmental and cultural values of the site
- Practical work (group work of 3-4 students)
  on the site exploring and envisioning a learning path with learning points
  - students receive maps of territory with marked interests points, but they explore the area by their own interests. in the exploring process, they find some hidden tools for easier observation (binocular, magnifying glass, historical documents)
- Create a possible solution to the problem: building a 3D model of their path
  Students create 3D models of their path from different materials based on their exploring on site and prepared materials. Instead of a classical interview and evaluation of their activities, they have to create 3D models. The methodology allows us a synthetic view of their interests, which is a very important component of peer-to-peer learning.
- Work in a classroom, cooperative learning:
  - each group of students presents their 3D models to other students
  they start to prepare contents and forms of their presentation, which would be interesting for peers (treasure hunt, police investigation ...)
  they test the application to overview its possibilities
- Evaluation and presentation:
  pupils create a draft of path - trailer, which presents the results of their work. The final version of the application will be finished next year.

Cross-curricular strategies

The cross-curricular approach was not used because of the small number of pupils and teachers the school has. They put a lot of emphasis on interdisciplinary implementation of the activity: language, science, history, geography, art, sport ...

20. Mountaineering Safety - PS14

ASM Pillar: Social - economic
Macro-issues: Towards a green alpine economy
Key alpine SD Issue: Tourism sector - Sport and leisure

Mountaineering Safety

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo
- Mountain Rescue Association of Slovenia - MRAS (unit GRS Bohinj)

SD VALUES

- Benevolence: to be responsible, to be loyal, friendship;
- Security: to be safe in the mountains, a healthy lifestyle;
- Self-direction: curiosity, creativity, freedom, choosing your own goals;
- Stimulation: excitement in life, daring;
- Hedonism: enjoying life;

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Organize, coordinates and executes nature guiding in a protected area;
- Know how to organize and prepare programs for different target groups;
- Plan and organize work assignments for the group;
- Caring for their own safety, the safety of others (is familiar with certain rescue techniques and with the basics of first aid and CPR);
- Communicating with colleagues, experts, clients, subscribers;
- The use of modern information and communication technology;
- Understand the importance of appropriate equipment when performing outdoor activities;
- Develop a sense of responsibility towards the environment, nature;
- Is familiar with the MRAS organization structure, its priority tasks, and training of mountain rescuers.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Possibly previously evaluate the consequences of actions and how to prevent undesirable ones; Accept responsibility of actions and choices done;
- Strategic: Use learner-centred methods for designing, implementing and adapting SD actions in the local communities;
- Collaboration: How to use communication tools, how to use participative and collaborative methods, Collaborate with others and learn from others; Understand and respect the needs, perspective and actions;
- Self-Awareness: Be aware in its own role in the local community and society;
- Integrated Problem-Solving: Think about a problem critically; Adapt physical skills to mountain performance requirements.

DESCRIPTION

Activity **Didactic methods** **Materials** **Location** **Time for activity**

1. VET module Nature guiding - theoretical and practical lessons Learner-centred methodologies Mountaineering gear (backpack, mountain shoes, sports clothing) Guiding in the vicinity of the school and throughout the Gorenjska region One day per week - throughout the year
2. Theoretical and practical training in MRAS rescue equipment Presentation, simulation of mountain accidents - practical training, learning by doing Rescue equipment, first aid kit School 2 days - project days
3. Implementation of nature guiding in small groups of students Teamwork, practical work, learning by doing, participative approach Use of different sources, bicycles, sports clothes, helmets Gorenjska region - the Radovna river valley 1 day/group of 3 students

Unit of Learning structure (phases of the project/times/structure in activities)

Activity description

Nature guiding is one of the key professional school subjects in the final year of the Nature conservation program. This school subject gives students competencies to organise any kind of tour in nature (hiking, mountaineering, cycling, tourist, educational, etc.) and for that, they need to use all the knowledge they gained throughout their schooling. These students also require the knowledge and skills how to act properly in the case of accidents and the first aid; therefore, they attended MRAS training during project days.

The non-formal educators in this 2-days pilot action were active mountain rescuers from Mountain rescue service Bohinj, which is an independent unit of the Mountain rescue association of Slovenia (MRAS). On the first day, students started in the classroom where they had an extensive lecture about MRAS - history, volunteers, training, their activities and raising the awareness about the dangers in the mountains, the importance of appropriate equipment, knowing one's own abilities, and nature preservation measure.

After the lecture students proceeded outdoors with practical activities. Mountain rescuers presented and practically demonstrated the use of various equipment: summer and winter mountaineering and climbing equipment, rescue equipment, and first aid and CPR kits. Mountain rescuers explained and demonstrated different situations of accidents and rescue procedures. Students actively observed them and tried to copycat them. In addition, they were also role-playing different scenarios where some students took on the role of casualty others took on the role of the rescuers. In the latter situations, they were challenged to actively observe the situation, Identify and asses the problem, take immediate actions, and take care of the casualty.

Towards the end of the school year, small groups of students selected the nature guiding topic themselves, planned and implemented it, and also evaluated it after they carried it out. Example: three students chose to organise a cycling tour along the valley of the Radovna River, where hilly meadows were selected as learning points of natural and cultural heritage, as well as a tour of the traditional homestead, a sawmill, a flour mill and a Cretaceous lake. They wrote a report on the finished nature guiding activities.

Outdoor activities

- All-day guided tours on foot, with bikes e.g. along the valley of the Radovna River

Tools and materials description

- Mountaineering gear (backpack, mountain shoes, sports clothing), bicycles ...
- MRAS rescue equipment
- first aid kits
- presentations

Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning joined with the participative approach:

- Introduction phase: the teacher presented the assignment of the whole day nature guiding to the students
- Learning phase: students got acquainted with individual phases of nature guiding and what they need to take into account during each phase - carried out in the classroom and in the field
- One of the important topics was security - project days with MRAS:
- demonstration of rescue techniques - learning by observing
- simulation of mountain accidents - role play, experiential learning, learning by doing
- Problem-solving phase (participative phase): small groups of students choose the topic of their activity then they plan and implement the guiding
- Evaluation of finished work: Students perform self-evaluation, in addition, they are also evaluated by the teacher and classmates
- Dissemination phase: Students offer their services to local tourist associations, retirement associations...

Cross-curricular strategies

The VET module Nature Guiding is designed cross-curricular and interdisciplinary. Students take this module in the 4th year because when they are planning and implementing it, they have to use professional skills they have gained in 4 years and are linked to the natural and cultural heritage of the area.

21. Multifunctional sustainable mountain pastures (research of historical – cultural heritage of the alpine pastures in Valtellina) - PS8

ASM Pillar: Socio-economic
Macro-issues: Towards alpine green economy, Cultural heritage preservation
Key alpine SD Issue: Sustainable economy, Traditional knowledge, Conservation of cultural heritage

Multifunctional sustainable mountain pastures (research of historical – cultural heritage of the alpine pastures in Valtellina)

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Instituto Tecnologico di Agraria, Agroalimentare e Agroindustria Sondrio
- Parco delle Orobie Valtellinesi

SD VALUES

- Universalism: to be broadminded, to protect the environment, to be unified with nature
- Self-direction: freedom, curiosity, creativity, choosing your own goals;
- Achievement: to be intelligent, successful, new capabilities;
- Security: Healthy lifestyle;
- Tradition: Respect for tradition;
- Benevolence: responsibility, loyal, friendship;
- The sense of identity;
- Value and respect for diversity;
- Commitment to sustainable development.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Understand the process of product selection based on its marketing and economic potential;
- Develop a positive attitude toward local alpine areas and their traditions;
- Is familiar with cheese and other dairy products of the region;
- Understand the technology for traditional cheese and dairy making;
- Be versed in professional terminology of mountain pasture and dairy production;
- Propose improvements in dairy product promotion;
- Compare different dairy products from an economic point of view;
- Know the specifics of mountain pasture (effect of pasture on the ecosystem, biodiversity of plants);
- Identify different herbs/plants in mountain pasture;
- Understand the connection between milk quality and pasture quality;
- Define the quality of pasture on a particular meadow and propose steps for improvement;
- Compare mountain pasture of today and of the past (similarities and differences);
- Be familiar with cultural heritage;
- List examples of economically sustainable practices in a mountain pasture;
- Develop communication and presentation skills;
- Develop "learn to learn" skills;
- Develop teamwork and cooperative learning skills and other social competences;
- Learn to identify business ideas in your local environment and develop entrepreneurial thinking;
- Develop Math, Science and IT skills (digital competences);
- Raising awareness about the "farm to table" process and its importance for the local community.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Analysis approaches;
- Normative: Gradually recognize the meaning and applicate norms and values underlying actions;
- Strategic: Concepts and methods for strategy building; Use learner-centred methods for designing, implementing and adapting SD actions in the local communities, and to deal with risks and changes;
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation;
- Self-Awareness: Different role for Sustainable development in the local community and global society; Reflect on its own values and personal bias; Be active in environment;
- Integrated Problem-Solving: Different problem-solving frameworks related to sustainability; ICT and Technologies to foster Sustainable Development; Facilitate collaborative and participatory approach and to deal with conflicts in a group; Think about a problem critically.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity Didactic Methods Materials Location Time For Activity

1. Promotion of local dairy products Cooperative learning, Learning by doing Computer Camera books School December - February
2. Evaluation of dairy products from an economic point of view (to interview elderly people, adults, young people, interpret statistics ...) Cooperative learning, Jigsaw method, interviews, research computer, camera books, audio - recorder, School December - February
3. Gain knowledge about mountain pasture (environmental and cultural-historical point of view), valorize mountain pasture attend scientific conferences as a source of information, practical work, learning by doing books, worksheets, plant-identification keys School, Alpe Piazza January - June

Activity description

Mountain pasture was a key SD issue, that was explored in a cross-curricular and interdisciplinary way. Students who attended the conference acquired knowledge about the cultural and natural heritage of mountain pasture. Using different sources in different school classes (Italian language and history) they explored the historical and cultural aspects of mountain pasture (customs, songs ...) in the area of Valtellina, while also using correct professional terminology. Students attending the zootechnics and crop-production VET module compared mountain pasture of today and of the past with a focus on the effects of pasture on the ecosystem and plant biodiversity. They identified grazing plants and, based on data analysis, discussed the connection between grazing plants and quality of dairy products, as well as the effect of grazing on the landscape. They learned about sustainable pasture practices that are also economically viable. Students proposed sustainable solutions for improvement of pasture.

In Marketing class students critically reviewed the promotional activities of local companies that offer dairy products. Then, using the jigsaw method, the evaluated the economic potential of traditional cheese and other dairy products and ran a role-playing simulation of a company deciding which potential product to invest in and offer on the market. Students directed the learning process - inquiry-based learning, joined with the participative approach, with emphasis on self-evaluation.

Outdoor activities

- Attending a scientific conference about mountain pasture in the Valtellina area (cultural and historical aspect, comparison of mountain pasture of today and of the past, economic aspect)
- Interviewing elderly people, adults and youth in order to acquire information about their familiarity with traditional dairy products.
- Visiting a mountain pasture and identifying grazing plants using a plant identification key and evaluating the quality of pasture. Students later prepared proposals for improvement of pasture.

Tools and materials description

- Audio recorder, Camera, Computer, Books, Worksheets, Photo - identification keys ...

Project STRATEGIES

Strategies, methods, techniques

In the activities where students valorized the economic potential of a traditional dairy product, the following learner-centred methodologies were used: inquiry-based learning with the participative approach, jigsaw method and experiential learning

b. The table below demonstrates how specific phases of inquiry-based learning overlap with steps of the jigsaw method.

INQUIRY-BASED LEARNING WITH PARTICIPATIVE APPROACH: JIGSAW METHOD:

- Preparation and introductin phase:

Teacher, using the curriculum, defines the subject on which activities are based. Students lead the learning process. Non-formal educators are included when necessary.

b. Learning phase and problem-solving phase

I. phase: Collection of data and information - group work:

- each group of students chooses a dairy product: BUTTER, RICOTTA, CASERA, TALEGGIO, MOZZARELLA, BITTO)
- Researching the familiarity of their peers, elders and teachers with the product ...: traditional recipes, modern technology, product characteristics and expectations (interviews, surveys, statistical analysis)
- Create a marketing strategy for the chosen product 1. Divide the class into smaller groups

2. Smaller groups of students try to find solutions to the project and share their ideas/solution with others - cooperative learning
III. phase: Comparison of the chosen products:

They have to:
- Find common points in technologies, characteristics of chosen products
- Choose among products and define one they will be prepared to invest money in.
In this process, they develop their communication, negotiation and presentation competences.
2. Make new groups of students, where each member of a former group is sent to a different group.
IV. phase: We are a step closer to the final decision – work from the previous phase has been continued

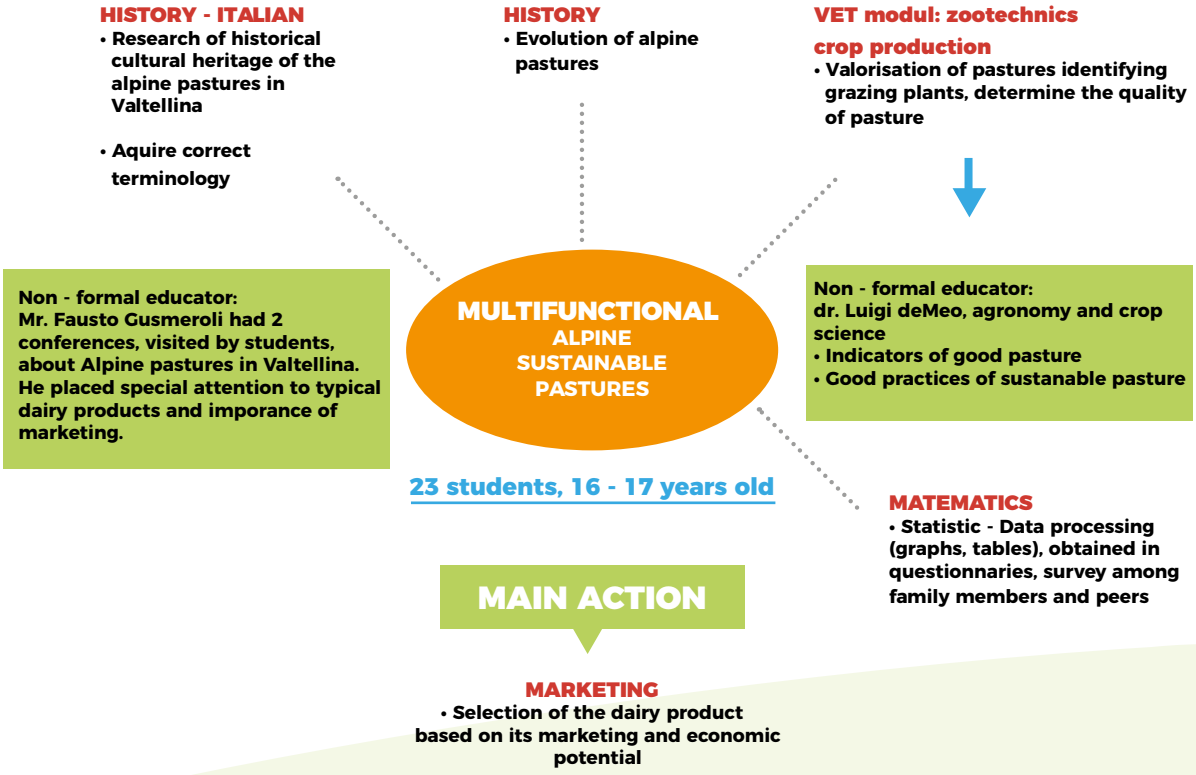
Heads of groups have to choose among products and define one, they will be prepared to invest money in, in line with budget, technology (ingredients, complexity and duration of technology, market survey). They try to optimize economic resources.

3. Heads of the previous groups make a new group - expert group.

4. After the expert groups finish the discussion, each of them returns to his/her home group and explain their assignment to the team.

5. Each expert group presents his/her discussion's outcome+
c. Presentation and evaluation:
A video was constructed, where the whole process was documented. After watching the video closely they reevaluate their work step after step - self-evaluation.
Comparison between theoretical knowledge and students' work and their decisions in the project.
Visit farms /agricultural companies, where employees present the process of choosing and marketing a product + sampling of dairy products

Cross-curricular strategies
Our project includes a variety of topics involving different school subjects (Chemistry, History, Italian language, Food processing and production, Livestock production and managing).

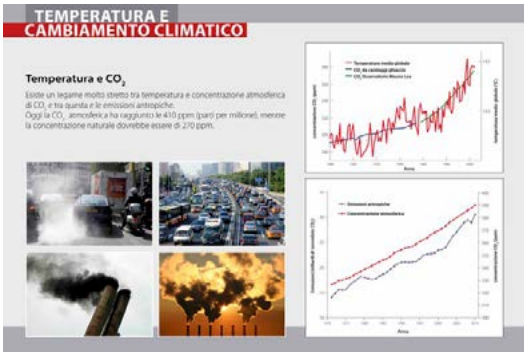


22. Young people raising awareness about climate change in the local community of Valtellina valley - PS9

ASM Pillar: Governance
Macro-issues: Participatory processes and local political perspectives
Key alpine SD Issue: Local cooperation

Young people raising awareness about climate change in the local community of Valtellina valley

Photo gallery



FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Istituto Comprensivo 2 Damiani di Morbegno
- Parco delle Orobie Valtellinesi (non-formal)

SD VALUES

- Universalism: to protect the environment, to see the beauty in the world;
- Self-direction: creativity, choosing your own goals, self-respect;
- Achievement: to be influential, new capabilities;
- Security: a healthy lifestyle, a sense of belonging;
- Tradition: respect for tradition, devotion;
- Conformity: politeness, self-discipline;
- Benevolence: responsibility;
- The sense of identity;
- Value and respect for diversity;
- Concern for environment and commitment to sustainable development;
- The belief that people can make a difference.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Gain knowledge about climate change and their impacts on the economy, glaciers, architecture;
- Develop communication and presentation skills.

Integration of SD non-formal competences (knowledge, skills, attitudes):

- Anticipatory: Information and data about plausible local area future multiple scenarios - possible, probable and desirable; Analysis approaches; Timescales relevant to the problem and possible solutions; Create one's vision for the future;
- Strategic: Use learner-centred methods for designing, implementation and adapting SD actions in the local communities, and to deal with risks and changes; Be open to varying perspectives;
- Collaboration: How to use communication tools; How to use participative and cooperative methods; Collaborate with others and learn from others;
- System thinking: Alpine key sustainability issues, their causes and consequences; Action, interests and mandates of key stakeholders in the problem constellation; Think Global, Act Local.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

	Activity	Didactic Methods	Materials	Location	Time For Activity
1.	Organization of exhibition, where students participate as students as well as presenters of their results on the topics of climate change	Active lesson Individual work Frontal lecture of the expert and students Practical work/Learning by doing	posters	Cloister of Sant Antonio in Morbegno	6h

Activity description

The pilot action was planned and implemented with the aim to raise awareness among students about climate change. Pilot action was planned out as the 4th phase of the other two pilot actions this pilot site carried out and its main purpose was dissemination and presentation of results. The interlacement of pilot actions contributes to the creation of a network of knowledge, skills and competencies.

The school organised a documentary exhibition financed by FAI (Italian Environment Fund) and SEV (Valtellina Economic Society) titled "Climate changes and possible scenarios for Valtellina Valley" at the cloister of Sant'Antonio in Morbegno from 08.03.2018 to 18.03.2018, and its purpose was for young people to raise awareness about climate change and the consequences in the local community of Valtellina valley.
Students gained knowledge during 4 conferences on Climate Change, which were enriched by lectures by climate change experts (the consequences of climate change in the local environment, the melting of the glaciers, the hydrological status and the economy).

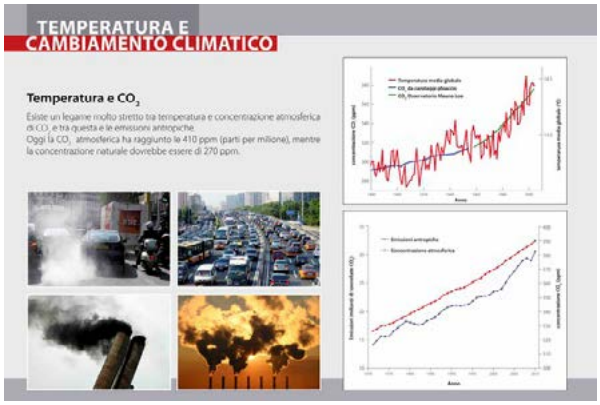
Students also presented their work and results. They prepared a map of the trails and marked locations, where QR codes were placed. The QR codes contain information about natural and cultural heritage in Italian and foreign language. Students guided visitors through the exhibition and therefore developed their communication and presentation skills.

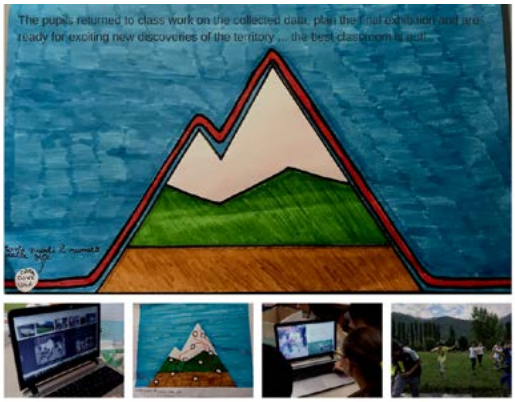
Outdoor activities

- Outdoor activities were carried out within the framework of the action "The geomorphology of the Valtellina valley", and at the exhibition, they only presented the activity.

Tools and materials description

- Posters





Project STRATEGIES

Strategies, methods, techniques

Students collected information throughout the pilot action and then carried out an experiment, analysed and evaluated the data, which they presented with various posters - research work.
They have developed presentational skills with an emphasis on the self-evaluation of their work (am I satisfied with the knowledge gained or work done) ... Guiding through the exhibition is also a part of The guidance after the exhibition is also part of experiential learning.

Cross-curricular strategies

The activities were carried out using the cross-curricular approach: languages, geography, science, technology, art ...

23. The challenges of managing protected areas on the example of the Triglav National Park - PS14

ASM Pillar: Governance
Macro-issues: Transnational cooperation and policymaking
Key alpine SD Issue: Policy making

The challenges of managing protected areas on the example of the Triglav National Park

Photo gallery

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

- Biotechnical centre Naklo
- Triglav National Park
- Bohinj Tourist Association

SD VALUES

- Universalism: to protect the environment;
- Self-direction: freedom, curiosity, choosing your own goals;
- Stimulation: variety in life;
- Achievement: to be intelligent, to be influential;
- Security: a sense of belonging, a healthy lifestyle;
- Tradition: respect for tradition;
- Benevolence: responsibility;
- Empathy;
- Commitment to sustainable development;
- The belief that people can make difference.

LEARNING GOAL/OUTCOMES

Formal competences (knowledge, skills, attitudes)

- Gain knowledge about Triglav national park (general information, the purpose of establishment, management of the protected area, nature conservation in the TNP (biodiversity, Natura 2000, the concept of ecological connectivity, knowledge of the regulations and problems arising from them in the field of agriculture, forestry, fishing, hunting, tourism);
- Is familiar with the Triglav National Park Act; advantages, disadvantages, opportunities and limitations deriving from it for different groups - tourists, local residents, employees, local authorities;
- Specify and clarify the legal regulation of spatial planning and regulation, water resources management (water as a public good and water management), forest management, waste management;
- Explain the basic principles of environmental protection (the principle of sustainable development, the principle of integrity, cooperation, prevention, admissibility of interventions in the area, etc.);
- Explain the importance of public participation in spatial interventions;
- Know the possibilities of a joint appearance on the market (students know the Bohinjsko trademark, the needs from which it was created and the conditions necessary for selling the product under a common brand name);
- Evaluate the importance of the application of particular nature protection legislation in certain situations and measures, and can also explain their evaluation and find sustainable solutions.

Integration of SD non-formal competences (knowledge, skills, attitudes)

- Anticipatory: Information and data about plausible local area multiple scenarios - possible, probable and desirable; Create one's own vision for the future; Possibly previously evaluate the consequences of actions and prevent undesirable ones;
- Normative: EU, national and regional regulations, opportunities for development; Gradually recognize the meaning and applicate norms and values underlying actions; Negotiate sustainability values, principles, goals and targets in a context of conflicts of interests;
- Strategic: Viability, feasibility, efficiency of systemic interventions; Use learner-centred methods for designing, implementing and adapting SD actions in the local communities; Be committed to integrity and ethics;
- Collaboration: Collaborate with others and learn from others; Understand and respect the needs, perspectives and actions of others (empathy);
- Systems Thinking: Alpine key sustainability issues, their causes and consequences; Actions, interests and mandates of key stakeholders in the problem constellation; Think global, act local;
- Self-Awareness: Be active in the environment;
- Integrated Problem-Solving: Think about a problem critically; Be open to varying perspectives.

DESCRIPTION

Unit of Learning structure (phases of the project/times/structure in activities)

Activity **Didactic methods** **Materials** **Location** **Time for activity**

1. Study of the Triglav National Park Act, management issues and posing relevant questions Frontal method, explanation and discussion method, search for resources, individual work Triglav National Park Act, Internet Resources classroom 9 + 2
2. Presentation of the TNP, legal bases and problems Presentation, frontal method, explanation and discussion method Presentation TNP info office 3
3. Facing problems in the field (tourism, supervisor's work, landscape management) Interview with nature protection supervisor, local people, tourists / Bohinj 3
4. Getting to know the Bohinjsko trademark, which combines typical traditional products made by local residents of Bohinj Presentation, interview with a representative of the tourist organization of Bohinj Presentation Bohinj 1
5. Role-playing game In-depth understanding of issues from different angles, expressing your opinion, finding a sustainable solution a written example on which the roleplay will be based (students had to find the examples online on their own) classroom 3

Activity description

The pilot action was prepared for VET module in Nature conservation program: Nature conservation legislation and ethics. Students were studying the Triglav National Park (TNP) Act and other legal bases in the class; they used practical examples to better understand specific items in the Act and familiarized themselves with the problem of managing a national park. It was planned that problematic of TNP would be presented in the field, but on the day of our field trip there was a massive snowstorm and activities were carried out in the headquarters of TNP. They discussed issues related to spatial management, agriculture, hunting, fishing and tourism. Later on, they had fieldwork where a ranger presented the topics discussed beforehand and his profession (which can potentially be their profession).

They also gained knowledge about the Bohinjsko trademark, which combines typical traditional products made by residents of Bohinj. Students learned the importance of a joint brand for the joint appearance in the market. They also gained insight into the importance of various homemade and crafts products.

After the field trip, students organized a role-playing game in class, where they highlight various aspects of the problem regarding management of the protected area and making compromises, challenges of the local economic development, and ensuring and providing a high quality of life for the local population.

Outdoor activities

- Students walked from Ukanc to Bohinj lake where a ranger made a presentation on the problematics present at the site connected to the management of the protected area (mass tourism, forest management, land use change) ...

Tools and materials description

Various presentations (TNP, Bohinjsko trademark), students had to find various examples on the Internet to use for their arguments during the roundtable debate on the issues of the protected area.

Project STRATEGIES

Strategies, methods, techniques

Inquiry-based learning:

- introduction of the problem: The students were divided into smaller groups where each group discussed a different pressing issue relevant to the TNP
  Example: CHALLENGES OF MANAGING THE TNP PROTECTED AREA – Mountain biking by the Mountain biking association
- Students receive theoretical knowledge: The students examined the legal basis for managing the TNP, focusing on the issues of the individual group (within the VET module)
- Practical knowledge: The students at the TNP excursion received additional insight into the issues mentioned above - they learned about the issues from TNP managers (experts and rangers) point of view

To conclude this activity they used the pro and contra method to form views:
+ unexploited tourism potential
+ + economic impact
+ specific target group of guests
impact on the environment: impact on vegetation, soil (erosion, compaction of soil) and animals (endangered animals, peaceful zones)
the use of trails intended for mountaineers (already heavily populated in the summer months).

- Create possible solutions for the problem: The students took on different roles that contribute to the problematics and read up on the related information on the internet. They used that information during a simulation of a roundtable where discussed the issues and tried to find possible solutions:
  - how are these problems solved in other countries
  - tables are prepared for suitability analysis, vulnerabilities on certain paths
  - proposals: marking, driving ban in a given period, parallel paths ...
  - they have devised the rules of conduct on the paths that were prepared for this purpose

Cross-curricular strategies

The module Legislation and Ethics of the Nature conservation technician program is carried out in the 4th year, when students have already gained knowledge about ecosystems, spatial activities, analyses and environmental monitoring, protection of natural values and biodiversity, and have experience of nature guiding. In the module they are upgrading their expertise: the activity was carried out interdisciplinary, as the issues were focused on agriculture, forestry, tourism, exploitation of natural resources ...

4. Alpine School Model certification process

1) Certification toolkit process procedures

Alpine School Model certification process aims at promoting good practices in Mountain oriented Education (MoE) principles, tailored on innovative Education for Sustainable Development (ESD) indications and in enhancing virtuous local networks and community concrete examples, as stated in the Alpine School Model. Schools and non-formal educational organizations are invited to attend a process in order to be certified on the basis of ASM findings: ASM certification process has to be intended as a voluntary educational and communication path for alpine local partnerships between schools and non-formal educational organizations. Petitioners, once candidates at the certification process, will receive following materials:

- Support and access to pedagogical resources
- Networking possibilities,
- Communication facilities: the annual logo label is a strategical communication tool addressed to users to pursue educational quality standards accountability.

Alpine School Model certification process strategy envisages the fulfillment of ASM contents and indications: it is required to petitioners to respect some requirements in order to be approved. Some of the requirements are mandatory and some are appreciated (see table of requirements). Applicants, in respecting each requirement, are anyway invited to interpret the indications given by the ASM in a subjective and creative way and in composing their project in experiencing innovative solutions.

Alpine School Model (ASM) Certification Toolkit includes information related to:

- procedures and standards to be followed during the ASM Certification process,
- project requirements that have to be respected in the Certification process planning and implementation,
- evaluation criteria.

ASM Certification process is a school year based lasting and can be achieved in three school years.

Certification beneficiaries

Even if project submitted by the partnership of schools and non-formal organization are the material which are evaluated by the commission, target of the certification are the partner's organizations themselves, which will receive the logo and will be certified on the basis of the ASM indications. Subjects enabled to be certified on the basis of ASM requirements are the schools which can designate a single class, a group, or the whole school to submit to the process.

School petitioners of the ASM certification process are required to create a local partnership combining with one non-formal education organization, in order to subscribe to the process request. Local wider networks bringing together several schools and different typologies of non-formal educational organizations, would be very welcome in the ASM certification process.

Non-formal educational organizations such are parks, environmental association, NGO and local/national/transnational umbrella organization can be included in the certification process by the schools.

At the end of the certification process, even if just one part of it followed the project, the whole scholastic institution and its partner will receive the accreditation of the certification.

Naming

Schools submitting to ASM certification process will be depositary of the title of Alpine school.

Non-formal educational organization submitting to ASM certification process will be depositary of the title of Alpine school partner.

ASM certification process procedures

In order to obtain the certification, applicants are invited to fulfill the following steps:

a) The Certification Charter form (Annex 6) will be filled by local partnership or network coordinator complete with the data reference of local partners, subscribed by all partners legal responsible and submitted within the online subscription procedures until the month of September of each year,

b) Petitioners schools and organizations partnership will experience the ASM indications and requirements during the whole school year, assessing and reporting performances and activities.

c) Petitioners schools and organization will submit an annual intermediate report to keep partner on track regarding fulfillment of criteria, problems, exchange, until the end of each school year within on-line procedures; eventual replacement in schools or non-formal organizational staff references can be registered. at the beginning of each school year,

d) The certification process will last 3 school years,

e) The final certification report will include extensive reporting with the declension of the project activities on the basis of an on-line form and it should be returned until the end of September of each year,

f) Certified schools and organization may be invited to the international or national meeting organized with the aim of sharing best practices through the ASM community and in presenting their highlight and experiences, also through multi-media presentations.

Certification outputs

The project endorsement will allow petitioners to obtain:

- The annual certification logo label that should be used for communication purposes (see Chapter IV - Par. 3),
- ASM documents and support materials,
- AlpsApp toolkit accounts.

Par. 2 - Set of requirements and project criteria

In the following table is presented the SET of certification requirements that petitioners have to follow during the three school years process of certification, in drawing up their project or educational activities.

	Certification process criteria		Supports offered by ASM	Status of criteria in evaluation process	Required quantitative thresolds
Contents	Alpine key SD issues	Local Alpine Key SD issues which integrate Environmental, Socio-Economic and Governance dimensions	ASM Thematical Framework (3 pillars, Key SD Issues, Topics) Frame with Topics and sub-topics branches	Mandatory	
	Alpine SD Values	Make explicit the ASM project underlying values	Map of humankind values Suggestion of relation between Alpine Key SD Issues and underlying values	Mandatory	
	Alpine - SD competences	Formal and non-formal educational organization should jointly design, plan an ASM inspired project integrating the UE formal competences with the non-formal SD competences	ASM set of SD competencies ASM scheme of articulation of competences in knowledge, skills, attitudes UoL scheme of planning	Mandatory	
Methods	Learner-centered methodologies	Learner-centered methodologies	Strategies, technique, methodologies learner-centered	Mandatory	
Activities	Integration between Formal and non-formal education actions	Stable cooperation with several non-formal educational organizations are required in order to foster an interdisciplinary approach to alpine Key SD Issues,	Continuative ASM related projects in School offer plan school lessons are alternate to visit/ outdoor experiences with non-formal organization leading	Mandatory	Collaboration between at least a school, a protected area and another local non-formal organization
	Outdoor learning activities	Ensure outdoor resources in learning settings	Suggestions of outdoor learning activities and technique	Mandatory	At least two outdoor activities per school year of which at least one in a protected area

Table 5 – Certification process criteria

	Certification process criteria		Supports offered by ASM	Status of criteria in evaluation process	Required quantitative thresolds
Further development	Cross-curricular perspective	The project planning should enhance interconnection within all school subjects	ASM topics and school subjects	Mandatory	
	Transferability and transnational collaboration	Project will be shared with similar experiences in other similar geographical contexts at the transnational level, through twinning or digital tools contacts	AlpsApp Toolkit governance section	Appreciated	
	Governance actions	Schools and non-formal educative system provide to learner possibilities of participative and governance experiences in the ways suitable to their age starting to schools in the neighborhood or in the local community.	ASM governance activities examples and suggestions AlpsApp Toolkit governance section	Appreciated	
Training	Education training	Ensure a yearly training session for teachers and educators in one of the following issues: Sustainable Development, ESD, MOE, Learner-centered methodologies, Outdoor activities		Appreciated	
Toolkit	Employ of the ASM Toolkit		AlpsApp Toolkit	Appreciated	

Par. 3 – ASM certification logo

5. Alpine School Model educational toolkit

Par.1 – ASM educational toolkit aims

Alpine School Model is accompanied by an educational toolkit in order to improve youth's knowledge on the natural & cultural alpine heritage, disseminating it within the certified schools, the protected areas, and within the synergy of main project deliverables.
ASM Toolkit concept was designed to represent the Alpine School Model assumption, in order to:

- Be strategic (not just adaptable to perform an activity, but a set of activities, not just a project but a plan)
- Facilitate learning -> serve as a practical tool of theoretical (Alpine School model) contents and support educators in fostering different typologies of MoE activities,
- be affordable in monetary terms
- be transferable to other alpine regions / transalpine
- preferably be developed in all alpine languages
- adapt to different age groups -> provide elements for different age groups
- not liable to be devalued after project lifetime
- link to science platforms / cooperation spaces would be great
- be innovative (e.g. an App) and allow social interactions and SD participative initiatives among youths.

Following these principles was outlined the pedagogical toolkit concept as composed by digital and textual elements:

- a document with a list and a description of resources and the suggestions for in depth study of the issues and the methods proposed by the Alpine School Model,
- a GIS-based citizen science app for sites, organizations, initiatives, was created in order to support and create transnational contacts and projects.

Par. 2 – Supports for ASM educational activities

Technology, in one form or another, has always been part of the teaching and learning environment. It is part of the teacher's professional toolbox. In other words, it is among the resources that teachers use to help facilitate student learning.
Technology has changed dramatically over recent decades. The increasing variety and accessibility of technology has expanded the toolbox and the opportunities teachers have to use it.
This section considers the technologies that are available to teachers to support their teaching strategies focusing on software, applications and resources that support teaching and learning with attention to the environmental issues.
Learning with technology has become essential in today's schools. Worldwide, governments, education systems, researchers, school leaders, teachers and parents consider technology to be a critical part of a child's education.
Digital learning resources support information processing by helping students to develop mental representations through the mix of media elements presented to them. Digital learning resources include content and, sometimes, learning activities. They combine multimedia elements including text, image, video and audio to present information.
Teachers use digital resources for a variety of purposes and in many ways, including:

- As a way to introduce students to a topic
- As part of a teacher lecture or demonstration
- As a stimulus to group or whole-class discussion
- To provide students with access to different text types

- To engage students in activities that are not possible in the classroom

For examples teachers could use digital resources in learning experiences to produce:

- WebQuests - an inquiry-based activity that embeds the use of a variety of learning resources – with most being digital learning resources available on the internet
- Blogging -journal writing has long been an activity utilized in the classroom. This traditional, notebook-and-pencil activity can become digital when word- processing software is used.
- Cooperative Learning
- Multimedial ppt using Flipped Classroom and EAS methodologies
- Multimedial presentation using IBL/EBL methodology

The following are multimedia resources allowing to realize sustainable learning experiences in the environmental field.

GREEN WEBSITES

https://www.nasa.gov/content/environmental-management-division-0
NASA's Environmental Management Division (EMD) provides leadership and guidance on environmental issues at NASA

http://wwf.panda.org

WWF Network will focus on six major goals - forests, oceans, wildlife, food, climate & energy, and freshwater – and three key drivers of environmental problems – markets, finance and governance.
http://www.unesco.org/new/en/natural-sciences/environment/

UNESCO works to advance and promote science in the interests of peace, sustainable development and human security and well-being, in close collaboration with its Member States and a wide variety of partners

https://www.nature.com/nature/focus/index_earthandenvironment.html
https://www.nationalgeographic.com

A channel dedicated to the sciences, it contains a high number of high-quality multimedia resources

https://www.sciencedaily.com/news/top/environment/

With almost 20 years of experience on the shoulders, Science Daily is now an authority in the world of scientific popularization. It collects news and insights from various fields - biology, physics, chemistry, medicine, education and much more - and transforms them to make them accessible to the widest possible audience

https://www.treehugger.com

TreeHugger is the leading media outlet dedicated to driving sustainability mainstream. Partial to a modern aesthetic, they strive to be a one-stop shop for green news, solutions, and product information

http://www.realclimate.org

RealClimate is a commentary site on climate science by working climate scientists for the interested public and journalists

https://grist.org

Founded in 1999, Grist is a beacon in the smog — an independent, irreverent news outlet and network of innovators working toward a planet that doesn't burn and a future that doesn't suck.

https://liftshare.com/uk

This is one for people who want to take practical action to reduce their carbon footprint

https://www.recyclenow.com

A practical guide to recycling – and a site where you can buy those great recycled gifts, such as circuit board coasters and camera bags made of belts.
http://www.earthshare.org/about-earthshare.html

EarthShare is a nonprofit partner with a 600-member strong network of America's most respected environmental and conservation organizations.

GAMES

The game although faced by various angles, is considered for its role and its central function fundamental in the learning processes. Play is a free and creative expression, its use as a recreational activity became a framework for a relational and educational space between teachers and students capable of uniting the needs of the large world of adults with those of little worlds of childhood. Through play, teachers can help their students in the daily effort they make to find the natural composition of their "I" in training. The game marks, in fact, a fundamental moment in the child's growth commitment and is the creation of an evolving mind and in constant search for new stimuli to develop and organize itself.

VIRTUAL GAMES

https://games.noaa.gov
The National Oceanic and Atmospheric Administration (NOAA) wants to spark environmental awareness and the well-designed games are the most entertaining way to go about it. Its site acts as a portal, as most of the games are hosted on channels like PBS. But each game addresses the key concerns of our planet and also demonstrates solutions that can work in the real world.
http://persuasivegames.com/files/windfall/
Learn a lot about renewable wind energy by building a wind farm.
http://climway.cap-sciences.net/us/index.php
Learn more about climate change
http://persuasivegames.com/games/game.aspx?game=arcadewireoil
Learn how oil drives our politics and economics
https://www3.epa.gov/recyclecity/
Learn what you can do to help protect the environment
http://pbskids.org/lifeboat/
Learn how the biology of an ecosystem affects the planet
http://www.smogcity2.com
Control the city pollution and give citizens a healthier urban life
https://www.audubon.org/mission-migration-game
Learn how birds migrate and the effect of human pollution on their migratory patterns.
https://www.epa.gov/students/games-quizzes-and-videos-about-environment
Games, Quizzes, and Videos about the Environment
http://www.alpconv.org/en/activities/younggeneration/game/pages/default.aspx?AspxAutoDetec
Cards game "The world of the Alps":
www.lamiaterravale.it
Interactive educational and entertaining tool aimed at public administrators, citizens, farmers, students, teachers of the communities interested in Natura 2000 sites. The player, taking the role of a farmer or a breeder, has the possibility to understand which Difficulty deals with those who deal with agriculture but

also to discover the environmental, economic and social opportunities offered by Rete Natura 2000.

EXPERIENCES AND LAB

https://www.khanacademy.org/about
Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom.

https://sciencejournal.withgoogle.com/experiments
A google app that allows you to make measurements with the sensors integrated into your smartphone, you can also integrate with external sensors.

https://phet.colorado.edu
Interactive simulations for science and math.

https://www.golabz.eu
In the Go-Lab repository it is possible to find remote and virtual laboratories for different scientific fields such as Physics, Astronomy, Chemistry, Biology, Geography and Mathematics.

PHISICAL GAMES

Entdeckerweste" the "explorer´s vest" for school children
A vest filled with tools to explore nature, like a compass, a Box magnifier, sheets to identify the most important trees,
"Water school box" of National Park Hohe Tauern
A box filled with tools to learn about water and the life in and near water.

CARD GAME "WHATS BEHIND ALPS?"
The game consists of cards. On each card there is presented one mountain and below picture, there are written information of the mountain: the elevation, walking duration to reach the top of the mountain, distance from the capital city of the country where the mountain is located, number of skiing places, number of mountain cabins, the year when the first path was established on that mountain.

KITS TO SUPPORT OUTDOORS ACTIVITIES

Dans les pas des animaux des parcs nationaux alpins / In the footsteps of the animals of the alpine
"An original and playful kit to spot animals in the Alps. Transparent index cards (printed realities and scientific data) with a user guide to be taken in family hike in an accessible and practical format "(In French only)
http://www.eredejeux.com/1338_kit-decouverte-ludique-des-empreintes-danimaux.html
http://boutique.mercantour.eu/index.php?id_product=142&controller=product
Kit pédagogique Neige sauvage / Educational kit Wild snow
"The teaching material "Wild snow": discovery of the Alpine environment and its many facets, arouse interest in the social, ecological and economic contexts of the Alpine environment. (in french and german)
http://mountainwilderness.ch/fileadmin/user_upload/pdf/projekte/bergsport_winter/lehrmittel_wild_im_schnee/Spielbeschrieb_A4.pdf
http://mountainwilderness.ch/projekte/bergsport-winter/lehrmittel-wild-im-schnee/
http://mountainwilderness.ch/fr/projets/alpinisme-hivernal/materiel-pedagogigue-neige-sauvage/
Alpi Marittime/Mercantour (2017): Kit di scoperta. Le rocce del territorio marittime-mercantour
Discovery tool in order to discover local geology ONLY for Italian schools
Vita da Lupi - secondary/upper secondary schools
The game covers the events of man and the wolf in the Alpine arc for a period of 4 years. 5 groups of players will interpret the packs of wolves and a group of players the man. Every year it is divided into game turns. In each round each flock will act in sequence.

Arctosgame
As part of the LIFE ARCTOS project, the Lombardy Region offers information and awareness raising activities in schools in the Alpine area, falling within the mountain territory of the provinces of Bergamo, Brescia and Sondrio. The proposal is divided into training seminars for teachers and a competition for classes that will give access, for the 40 winning classes, to a free training course.
YrA-Activity game
This is a game played in 2-4 teams with at least 2 players each. The teams' players move over the board, the goal is to reach the finish. Depending on the sort of field they are currently standing at, one player has to act or to describe or to paint a phrase (about alps) given on a card and the other members of his team have to find out what that should be. If they manage to do so, their team moves forward. They can choose easy phrase (3 points), more difficult one (4 points) or the most difficult one (5 points) – accordingly they move for 3, 4, or 5 fields.
Sustainable mountain- oriented adventure race - students
This "adventure race" is played on the field, with the group being divided into smaller groups (of max. 5 participants in one group). The game is conducted as a speed-oriented race, where each group is testing its orientation and sports skills, while exploring the nature with sustainable means of transport. Through this race participants hone their orienteering skills, while thinking about sustainable mobility modes and becoming a tightly connected group, since the whole race is designed as a "team building" exercise.
Foto-alpen (foto album of alps mountains) – primary school
We will prepare a "photo album" of Alps with the explanation of the nature (mountains, animals, flowers etc. – interesting information). It is "half prepared" album, with only explanations, when the main idea is, that when reading and learning about the Alps student find pictures of that certain element, that s/he is reading about on web (it could be on our web page, hidden with the special password, given in the album). Teacher (or student by himself/herself) print that picture and stick it to the album. The final result is personal complete album with all pictures of Alps and its nature.

APPS

The APP for mobile phones "The most beautiful views in the Alps" will be developed and it will be accessible for free to everybody. The main idea is to get pictures with the most beautiful views in the Alps – the promotion of certain areas (tourist attractions). The app will enable everybody to put his/her own picture and short explanation of a visit. Every picture is put on the map of Alp region.
In the app "Butterflies of Austria" you can find 140 Austrian butterfly species recorded with high-quality photos and detailed profiles. Butterflies can be easily and quickly photographed and determined with the app. Regardless of whether you observe and report butterflies in your own garden, while hiking, on school trips or while walking through the park: Austria's largest butterfly portal and a nationwide Citizen Science project are being set up together. It was produced by "Stiftung Blühendes Österreich"
https://schmetterlingsapp.at/ Only available in German

TOOLS AND DOCUMENT FOR IN DEPTH STUDIES

http://alpsknowhow.cipra.org/

CD Alps Know-how:
http://www.alpconv.org/en/publications/brochures

"Climate change – How it affects the Alps and what we can do"
"Handbook for Nature park schools and Nature freaks"
A handbook for teachers filled with ideas for games, experiments, templates, etc. about nature park topics. Teachers can use it for various school subjects. They do not need nature park staff to do this experiments and games. It was produced by us (RMB) It is only available in German.
"**Worksheets about the nature- and national parks in Burgenland and western Hungary"**
the worksheets offer interesting insights into the characteristics of a protected area in the Western Pannonian

region. Thus, the peculiarities such as animals, plants, landscape phenomena and cultural-historical peculiarities can be elaborated, puzzled and explored in a playful and interactive way.
http://www.umweltbildung.at/cms/praxisdb/index.htm
Austria forum for environmental education
http://www.carpathianconvention.org/tl_files/carpathiancon/Downloads/02%20Activities/2.1.13.1%20Move%204%20Nature%20-%20CarpathianMountainsESDToolKit_en.pdf
Carpathian Convention

TECHNOLOGIES AND STUDENTS' EXCHANGE

Erasmus+ is the EU's program to support education, training, youth and sport in Europe. Its budget of €14.7 billion will provide opportunities for over 4 million Europeans to study, train, gain experience, and volunteer abroad.
The aim of Erasmus+ is to contribute to the Europe 2020 strategy for growth, jobs, social equity and inclusion, as well as the aims of ET2020, the EU's strategic framework for education and training.
Erasmus+ also aims to promote the sustainable development of its partners in the field of higher education, and contribute to achieving the objectives of the EU Youth Strategy.

- Specific issues include:
- Reducing unemployment, especially among young people
- Promoting adult learning, especially for new skills and skills required by the labor market.
- Encouraging young people to take part in European democracy
- Supporting innovation, cooperation and reform
- Reducing early school leaving

Promoting cooperation and mobility with the EU's partner countries
http://ec.europa.eu/programmes/erasmus-plus/node_it
E-twinning
e-Twinning offers a platform for staff (teachers, head teachers, librarians, etc.), working in a school in one of the European countries involved, to communicate, collaborate, develop projects, share and to be part of the most exciting learning community in Europe.
https://www.etwinning.net/en/pub/about.htm

Par.3 – Alpine School App, discover-learn-experience

Alpine School App purpose, is finalized to strengthen Alpine School Model contents transmission. The app should support users (schools and non-formal educational organizations) in the possible following ways:

- providing practical experiences related to key alpine sustainable development Issues of the ASM (such are the naturalistic, cultural/socio-economical and governance issues)
- providing practical governance experiences in improving, for example, activities such are citizen science approach,
- representing a communication tool for users to create wider transnational community of practices, in which to exchange information about educational opportunity in order to establish twinning or visits experiences across the alpine countries (a sort of atlas of best practices),

Beneficiaries of the app are the class and the groups of learners following the indications of the Alpine School Model. In the different section presentations will be highlighted specific target groups and beneficiaries of different app functions.

Alpine School App thematical sections

Alpine School App environmental: phenological observation app

Phenology deals with the development phenomena in plants and animals that reoccur every year depending on the weather. In particular plants appear as complex measuring instruments for many environmental factors, such as temperature curves, water supply, the prior year's situations and many others. The best thing about it: no matter how complicated the processes in and around the "chemicals factory" a plant may be: the result is wonderfully easy to see for any child: flowers or no flowers! It is not necessary to spend many years studying or to buy expensive equipment for this. It is quite enough to take a closer look and compare lower or higher regions to each other. This will lead to increasingly stable images of interrelations in nature, forming almost of their own accord.
This section of Alpine School App will allow to:

1) take pictures of dozens of animals and plant species that are typical for the Alps
2) enter their current developmental phases.

Opportunities for observations are available in outdoor lessons, on field trips, on your way to school or while hiking.
If using this regularly, it is possible to see how climate change affects animals and plants, and which interrelations there are between annual weather and biodiversity. The individual phases of the development of nature pass by us as if pulled on a string. Each section keeps a respectful distance from its neighbor. The most important phenomena to observe are:

Unfurling leaves
The first leaves are completely unfurled in 3 places on a plant. They have reached their final shape, but not yet their final size.

Start of bloom
The first blossoms are completely opened in at least 3 places on the same plant and their stamens are exposed.

Start of the maturing of the fruit
Normally grown and healthy fruits are completely red in at least 3 places of the plant.

Leaf colouration more than 50%
About half of the needles, including those already fallen, are coloured yellow on several trees.

Arrival
First sighting of birds after they return from the South.

First calls
First calls of birds in spring

Rut
Spotting distinct rutting or mating behaviour of certain mammals and birds for the first time in a given year.

Table 6 – Phenomena observed and registered in ALPSApp environment

The easiest way to deal with phenology is to go outside and look for the phenological phases that you just happen to discover. Look at the plants around you and pay attention to the phenological phase they are in. Is it possible to see a shrub that is bursting with buds, that is just blossoming or where the fruits are ripening? Once you've discovered a phenological phase, take a picture of it.
Depending on the season, different plant phases, also called phenomena, can be observed. Among the most important are unfurling of leaves, start of bloom, maturing of fruits and leaf colouration.

To make sense of phenological observations, is necessary to make comparisons with other people's observations (see app tutorial for instructions on how to download your own data and set filters for other people's data). It is possible to compare phenological observations from:

- Different locations (but from the same year)
- Different years (but from the same location)

If you compare different locations, you can see the influence of the local climate on plant growth. Plants growing in valleys with south exposure in the southern alps will very likely have the earliest budding, leafing, flowering and ripening observations. Vice-versa plants growing in the mountains with north exposure in the northern alps will very likely have the latest budding leafing, flowering and ripening observations.

If comparing different years, it is possible to see the influence of the yearly regional climate on plant growth. In years with early warm periods or intermittent especially warm periods phases, such as budding, leafing, flowering and ripening can occur much earlier than expected in the long-term average. The other way around, in years with an extended winter or intermittent especially cold periods phases such as budding, leafing, flowering and ripening can occur much later than expected in the long-term average.
Climate change affects the occurrence of especially warm or especially cold temperatures, therefore, in observing the plants around it is possible over some years, to closely see its effects on the plants around you.

Alpine School App governance: communication and information

ASM indications are intended to encourage an active transfer to the learner's own life and community and to the natural world/ global issues: the final goal is to change youth lifestyles and behaviors, in both their personal community context, according to their age and school level.
ASM indications on governance activities are provided to ensure that participants can be engaged in the learning/teaching process and that they can take informed decisions on real life sustainability issues or should be able to work together actively and involve their communities in collaborative solutions, to examine their assumptions, knowledge, and experiences, in order to develop critical thinking, and to be open to change, or to be aware of cultural practices as an integral part of sustainability issues.
Being adequately informed and enhancing communication among different educational experiences is the first step for activating communities into sustainable development claims.
Aim of this Alpine School App section on governance is to encourage youth to share experiences, projects, ideas and in the same time to foster transnational communication and contacts among the educational community of the Alpine School Model. Information and communication are, indeed considered the first step of governance.
Within this app section, users will be able to provide comments on activities done, on places in the Alps they visited and giving information about cultural heritage, traditions, sustainable communities and alpine green economy, through uploading pictures and small texts or emoticons of their educational activity. In this way we would encourage story telling on the experiences and discovers they did and the app should become a sort of digital atlas of educational opportunities.

Annexes

Annex 1 –Alpine key SD issues and SDG's

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
Environmental	Biodiversity conservation	Ecosystem conservation	Ecology Ecosystem Threats to biodiversity Biological Conservation and management		Ecology: competition, predator-prey, community dynamics, energy flow through food webs, dispersal and ranges. Specific ecosystems – local and global native ecosystems Threats to biodiversity: habitat loss, deforestation, fragmentation, invasive species and overexploitation (caused by unsustainable production and consumption practices, unsustainable technologies, etc.) Strategies: - Ecological connectivity - Degraded habitats preservation and restoration Ecosystem services management Ecosystem services (cultural, provisioning, regulatory and supporting)
			Water ecosystems		Importance of water-related ecosystems
		Species and wild population conservation	Species biodiversity		Biodiversity of seeds, plants and animals, particularly in relation to wild species
			Evolution and genetics		Evolution and genetics, genetic resources, The dangers of extinction: Individually endangered species, how extinction is forever, the long time needed to form species, and the six mass extinctions
Environmental	Agro-managed landscape conservation	Farming and forestry maintained landscape	Food production		Main drivers and root causes of hunger and malnutrition

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
Environmental					Sustainable food - agriculture, organic agriculture and permaculture
			Deforestation Forest overexploitation		Managed forestry plantations and ecosystem Deforestation and efforts to combat them, Ecosystem overexploitation
	Climate change adaptation & mitigation	Natural hazards prevention	Natural hazards		Relation between natural hazards and poverty
			Food security		Relation between climate change and food security
			Resilience prevention		Disaster preparedness and resilience, resilience to weather problems and in the future and a culture of prevention and preparedness
			Mitigation		Climate change-related hazards leading to disasters like drought, weather extremes Prevention, mitigation and adaptation strategies and their connections with disaster response and disaster risk reduction

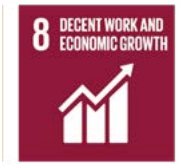
ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
Environmental		Energy efficiency and renewables	Energy efficiency and renewables		Different energy types, especially renewable energies like solar, wind, water, geothermal, tidal Energy production, supply, demand and usage of different countries Energy efficiency and sufficiency in energy usage Strategies: Centralized versus decentralized energy production; energy self-sufficiency, e.g. via local energy supply companies (LESCOs) Environmental impacts and issues of energy production, supply and usage (e.g. climate change, grey energy) The role of the public and private sectors in ensuring the development of low carbon energy solutions Peak of oil production and energy security – (over)dependence on non-renewable energies like oil Bridging technologies and technology for a 'cleaner' use of fossil fuels
					Sustainable resilient buildings and spatial planning (building materials, energy saving, planning processes)
		Adaptation measures	Adaptation measures		Consequences of hunger and malnutrition on the health and well-being of people, including practices like migration as adaptation
					Disaster preparedness and resilience, resilience to weather problems and in the future and a culture of prevention and preparedness

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
					Greenhouse gases and their emission trends Energy, agriculture and industry-related greenhouse gas emissions Climate change-related hazards leading to disasters like drought, weather extremes Prevention, mitigation and adaptation strategies and their connections with disaster response and disaster risk reduction
	Natural resources exploitation and management	Wood and non-wood forest products	Biodiversity		Biodiversity of seeds, plants and animals, particularly in relation to wild species
		Wood and non-wood forest products	Deforestation Forest overexploitation		Managed forestry plantations and ecosystem Deforestation and efforts to combat them, Ecosystem overexploitation
		Water	Water pollution		Chemicals, pollution and contamination of water
		Water	Water Cycle Water Consumption		The hydrosphere: The water cycle, cloud formation, water as the great climate regulator - and water distribution Impacts of pollution, dumping and release of hazardous chemicals and materials on water quality The human right to water and water as a global common good/ water security: - importance of equitable access to safe and affordable drinking water - importance of adequate and equitable sanitation and hygiene, water quality and quantity parameters for health
		Water	Water scarcity and efficiency		Water cycle and restoring ground water through urban design

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
					Water scarcity and water use efficiency (water harvesting, water efficiency, waste water treatment, recycling and reuse technologies, integrated water resources management) Relation between food security and the depletion of soil quality
		Soil	Soil use Soil contamination		Chemicals, pollution and contamination of soil
		Waste	Waste production		Food production and consumption agriculture, food processing, waste generation
			Waste management and waste prevention		Waste generation and management (prevention, reduction, recycling, reuse)
Socio-economic	Sustainable and cohesive communities	Resilient cohesive and cooperating communities	Poverty distribution Poverty, social vulnerability and Resilience Welfare		Local distribution of extreme poverty and extreme wealth and their reasons Resilience of the poor and those in vulnerable situations The importance of social welfare protection systems and measures
			Hunger and malnutrition		Main drivers and root causes of hunger and malnutrition Hunger in relation to food abundance, obesity and food waste

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
			Discrimination		Discriminatory attitudes towards people with illnesses or mental disorders Direct strategies to promote health and well-being, e.g. vaccines, healthy food, physical activity, mental health, medical consultation, education, sexual and reproductive health education. Indirect strategies (public health): political programmes for health insurances, affordable prices of medicine, health services including sexual and reproductive health care services, drug prevention, transfer of knowledge and technology, reduction of pollution and contamination, early warning and risk reduction
			Quality education Education for Sustainable Development		The relevance of inclusive and equitable quality education and lifelong learning opportunities for all (formal, non-formal and informal learning, including the use of ICT) and at all levels for improving people's lives and sustainable development Diversity and inclusive education Basic skills and competencies needed in the 21st century (Knowledge, values, skills and behaviours needed to promote sustainable development) The concept of education for sustainable development (ESD), whole-institution approach as a key strategy to scale up education for sustainable development, and pedagogy for developing sustainability competencies Youth empowerment and empowerment of marginalized groups
			Gender inequality and equality		Gender inequality, traditional gender roles and structural discrimination Gender and labour, including pay disparity and recognition of unpaid work Gender and educati on, including gender equality in achieving primary, secondary and tertiary levels of education Sexual and reproductive health and rights Gender and poverty, including food security and financial dependence
		Communication and digital divide	ICT		Access to basic services

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
			Discrimination		The relevance of inclusive and equitable quality education and lifelong learning opportunities for all including the use of ICT
	Towards a green alpine economy	Multifunctional sustainable agriculture	Sustainable agriculture		Community-based agriculture and community supported agriculture, Food processing,
			Sustainable forestry		Sustainable Forestry
		ICT sector			Appropriate new technology
			Innovation technologies		The sustainability of information and communication technology (ICT) including supply chains, waste disposal and recycling The need for basic infrastructure information and communication technologies The sustainability of the internet – from green chat groups to the ecological footprint of search-engine servers
		Turism sport and leisure economy	Turism economy		Cooperation on and access to science, technology and innovation, and knowledge sharing Distribution of access to the internet
		Turism sport and leisure economy	Turism economy		Waste generation and management (prevention, reduction, recycling, reuse) Labelling systems and certificates for sustainable production and consumption Green economy (cradle-to-cradle, circular economy, green growth, degrowth)

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
		Smart and sustainable economies	Sustainable economies		Appropriate new technology and financial services including microfinance
					Global food – import, export, cash crops, international taxes, subsidies, trading systems, merits, risks
					The contributions of economies to human well-being, and the social and individual effects of unemployment Economic ethics Theoretical assumptions, models and indicators of economic growth (GDP, GNI, HDI) Alternative economic models and indicators financial systems and economic development Labour force (increase in population through birth rates, migration, etc.) Inequalities in the labour market: representation and participation of different social groups, and different income/wages and weekly worktime between countries, sectors, social groups, genders Formal and informal labour, labour rights, especially for migrants and refugees, forced labour, slavery and human trafficking Entrepreneurship, (social) innovation, new technologies and local economies for sustainable development

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
			Industry Industry innovation		The relation of quality infrastructure and the achievement of social, economic and political goals The need for basic infrastructure like roads, information and communication technologies, sanitation, electrical power and water Inclusive and sustainable innovation and industrialization Sustainable and resilient infrastructure development Sustainable electricity: national grids, feed-in tariffs, expanding sustainable renewable sources, conflicts The sustainable job market, opportunities and investments The sustainability of transport infrastructure Alternative currencies as investment in local infrastructure
			Responsible consumption Green economy		Advertising, peer-pressure, belonging and identity-creation Production and consumption history, patterns and value chains, and management and use of natural resources (renewables and non-renewables) Environmental and social impacts of production and consumption Labelling systems and certificates for sustainable production and consumption Green economy (cradle-to-cradle, circular economy, green growth, degrowth)
					Social and economic impact within households, communities and countries and between countries
			Development cooperation		Governance and policies and the global market and trading system in the light of sustainable development Development cooperation, development assistance, and additional financial resources for developing countries from multiple sources

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
	Historical and societal identity	Cultural heritage preservation	Cultural heritage preservation		
		Smart and sustainable economies	Sustainable economies		Local food Physical, emotional and socio-cultural functions of food
			Ethical values		Philosophical and ethical conceptions of life quality, well-being and happiness
					Dietary choices and habits.
			Sustainable lifestyle		Sustainable lifestyles and diverse practices of sustainable production and consumption
	Regional and local cooperation		Development cooperation		Development cooperation
			Community decision making and governance		Communities and their dynamics (decision-making, governance, planning, conflict resolution, alternative communities, healthy communities, inclusive communities, ecovillages, transition towns)
			Justice and corruption		Corruption and how to measure it

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
			Cooperation among different sectors Citizenship Governance		Partnerships between governments, the private sector and civil society for sustainable development, Shared accountability possible conflicts between the different actors. Measurements of progress on sustainable development Governance and policies for market and trading system in the light of sustainable development Citizenship and citizens as change agents for sustainable development Capacity-building to support plans to implement all the SDGs
	Policy making		Decision making Governance		Communities and their dynamics (decision-making, governance, planning, conflict resolution, alternative communities, healthy communities, inclusive communities, ecovillages, transition towns)
	Policy making		Policy making		Policy frameworks at the local, national and international levels, based on pro-poor and gender-sensitive Development strategies
					Political, economic and social dimensions of energy and linkages to power constellations, potential conflict of interests (political and economic power (across borders),
					Local, national and global institutions addressing issues of climate change Local, national and global policy strategies to protect the climate Future scenarios (including alternative explanations for the global temperature rise)

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
			Partnership Cooperation Accountability Capacity building Citzenship		Partnerships between governments, the private sector and civil society for sustainable development, Shared accountability and possible conflicts between the different actors. Measurements of progress on sustainable development Local, national and global systems, structures and power dynamics Citizenship and citizens as change agents for sustainable development Capacity-building to support national plans to implement all the SDGs
	Partecipatory and democratic processes		Quality education Participation in democratic process of decision		The relevance of inclusive and equitable quality education and lifelong learning opportunities for all (formal, non-formal and informal learning) and at all levels for improving people's lives and sustainable development Diversity and inclusive education Basic skills and competencies needed in the 21st century (Knowledge, values, skills and behaviours needed to promote sustainable development) The concept of education for sustainable development (ESD), whole-institution approach as a key strategy to scale up education for sustainable development, and pedagogy for developing sustainability competencies Youth empowerment and empowerment of marginalized groups
			Gender equality		Gender equality and participation in decision-making Gender in community dynamics (decision-making, governance, child care, education, conflict resolution)
			Inclusion inequalities		Social, economic and political inclusion versus inequalities (on national and global levels) – typical discriminatory categories The meaning of rights to land, property and natural resources for equality and the impact of inequalities on vulnerabilities and capacities

ASM thematic framework			Suggested ASM Alpine SD Topics for school subjects	SDGs description (from Unesco, 2017- Learning objectives)	
Pillars	Macro - issues	Key alpine SD issues		SDGs	SDGs issues and suggested topics
					Communities and their dynamics (decision-making, governance, planning, conflict resolution, alternative communities, healthy communities, inclusive communities, ecovillages, transition towns)
					Partnerships between governments, the private sector and civil society for sustainable development, Global citizenship and citizens as change agents for sustainable development Cooperation on and access to science, technology and innovation, and knowledge sharing Global distribution of access to the internet Capacity-building to support national plans to implement all the SDGs Measurements of progress on sustainable development
	Funds and cooperation incentives		Funds and cooperation incentives		Partnerships between governments, the private sector and civil society for sustainable development, Cooperation on and access to science, technology and innovation, and knowledge sharing Capacity-building to support national plans to implement all the SDGs Measurements of progress on sustainable development

Annex 1 –Alpine key SD issues and SDG's

Environment

Since from primary school the attention is focused to develop an ethically oriented behavior and respectful of others, of the environment and of the nature.
Among the competence goals there is the living organisms observation and their environments, the natural phenomena, with particular attention to their changes.
The first cycle school covers a crucial period for the person full development and promotes the citizenship conscious practice.
Citizenship education aims to make the student aware about the importance of taking care of themselves and of the others in legality and responsible ethics way.
Environmental education is dealt with in the various disciplines in relation to the students age and maturity in transversal mode.

Primary and Secondary

HISTORY

Starting from primary school, topics covering all the human life problems on the planet are discussed: the use of different sources of energy, the defense from adverse natural elements, the natural environment progressive transformation, the technical development steps, good and food preservation.
At the end of secondary school the student must know how to use the knowledge to understand ecological, intercultural problems and the civil coexistence.

GEOGRAPHY

Learning goals at the end of primary school are: to capture through the world history the progressive man-made transformations on the natural landscape and realize that the geographic space is a territorial system, consisting of physical and anthropic elements linked by connection and /or relations. Learning objectives at the end of the secondary school are the knowledge of the elements characterizing the European and world landscapes, identifying the analogies and the elements of environmental and cultural value to be protected, as well as the problems related to the natural and cultural heritage protection and enhancement, proposing appropriate solutions in their own context of life.

SCIENCES

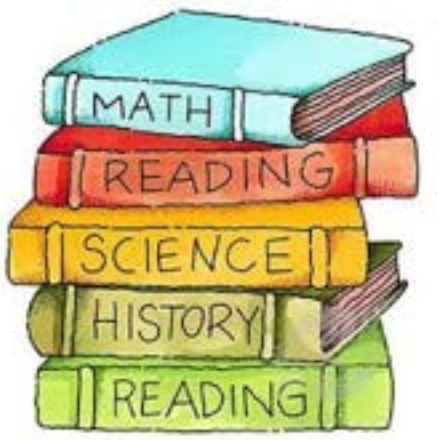
Among the goals for the skills development at the end of primary school there are the environment respect and the social recognition.
Learning objectives at the end of the secondary school are instead the observation and the interpretation of natural environmental transformations (by sun, atmospheric agents, water, etc.)
and those made by man (urbanization, cultivation, industrialization); the environmental changes interpretation, including global ones, particularly those resulting from modifying action man; the awareness of the human community role on Earth, natural resources and the inequality in access to them; ecologically sustainable personal behaviors and choices adoption; the respect for biodiversity in environmental systems.

ART AND IMAGE

The environment inspires art; art gives shape to the surrounding environment. This relationship becomes decisive for the common civilization preservation and well-being.
In the training activities field, familiarity with quality images and artworks sensitizes and enhances the

student creative, aesthetic and expressive skills, strengthens cultural preparation and helps the active and responsible citizenship. In this way the pupil is educated to safeguard the artistic and environmental heritage conservation, starting from the territory of belonging.
This will allow the student to recognize and appreciate the characteristic aspects of environmental heritage raising awareness about the problems associated with its protection and conservation.

TECHNOLOGY
There can be no technological progress that sets aside the respect for the environment: this is true for the big ones political and industrial decisions, as in the citizens daily choices.



This teaching area deals with the interventions and transformations that man works towards the environment to ensure survival and, more generally, their own needs satisfaction.
Already at the end of primary school, children know some processes about resource and energy transformation, with its environmental impact; it's a specific technology task to promote thought forms and attitudes in children and boys.
While at the end of the secondary school the pupil recognizes in the environment surrounding the principal technological systems and the many relationships they establish with living beings and other natural elements; knows the main processes of resource transformation or good production and recognizes the energy different forms involved.

HIGH SCHOOL

VOCATIONAL SCHOOL
The vocational schools paths provide that, at the end of the school cycle, the students are able to recognize the geographical, ecological, territorial aspects of the natural and anthropic environment, the connections with the demographic, economic, social and cultural structures and the transformations that took place during the time; to master the use of technological tools with particular attention to the environment protection, knowing how to apply the regulations that influence the processes for the territory protection and enhancement.

TECHNICAL SCHOOL
As recalled by student technical profiles at the end of the second cycle, the common learning outcomes provide that the student is able to recognize the geographical, ecological, territorial aspects of the natural and anthropic environment, the connections with the demographic, economic, social, cultural and transformative structures intervened during the time; to master the use of technological tools with particular attention to the protection of the person, of the environment and of the territory. It is expressly recalled that the student should be able to orient himself in the normative disciplining the productive processes, with particular attention to the environment and territory protection; he has to recognize the ethical, social, scientific, productive and economic environmental aspects of technology innovation and its industrial applications.

HUMANITARIAN, ARTISTIC AND SCIENTIFIC SCHOOL
Students must be aware of science and technology connection and of their correlation with the cultural and social context, with environment development and protection models. Interdependence knowledge between the evolution of science and technology and its implications ethical, social and environmental is an essential requirement. In the educational geography construction paths will be considered as main themes: the landscape, urbanization, globalization and its consequences, the relationship between economy, environment and society, the imbalances between world regions, sustainable development (energy, water resources, climate change, food and Biodiversity).

Environmental Paths

- Nature Protection
- Species Conservation
- Biodiversity Consevation
- Ecosystem Management
- Ecological Connectivity

Primary School

From curriculum

Citizenship and Constitution
Education for active citizenship

History
Knowledge related to the different energy sources use. Defense from the adverse natural elements.

Geography
Main physical geographic objects (rivers, mountains, plains, coasts, hills, lakes, seas, oceans, etc.). Landscape characters (mountain, hill, plain, volcanic, etc.). Natural landscape progressive transformations. Geographical space as a territorial system, consisting of physical and anthropic elements.

Science
Main characteristics animal and plant organism ways of life. Social and natural environment value

Art and image
Environmental and artistic heritage characteristic aspects and its conservation starting from the territory it belongs to

Technologies
Artificial elements and phenomena in the surrounding environment. Energy transformation and consumption processes, relative environmental impact

Suggested Educational Paths:

- Flora and fauna recognition: sensory paths on field
- Biodiversity in the four seasons
- Cultural diversity and diversity in alpine nature
- Food and biodiversity in the Alps
- Protected natural areas

Environmental Goals:

- Develop a systemic and complex approach to reading the territory
- Understanding the concept of the environment as an integrated relationships system
- Understanding the concept of interdependence between the individual and the environment
- Promote the ability to read the human activities impacts on ecosystems
- Create a sense of belonging to the territory
- Provide tools and models to actively participate in nature conservation
- Provide tools for species recognition and classification

SUSTAINABLE SKILLS:

- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to reflect on one's own role in the local community and (global) society

Secondary School

From Curriculum

Citizenship and Constitution

Education for active citizenship. Responsibility ethic acquisition

History

Environmental history essential process. Hypotheses formulation and verification on the basis of produced information and elaborated knowledge. Use of the learned knowledge to understand ecological, intercultural and cohabitation civil problems

Geography

Traditional and innovative tools use to understand and communicate facts and territorial phenomena. Landscape protection issues and problems understood as a cultural heritage and ability to plan enhancement actions

Science

Complex vision acquisition about the living system and its evolution over time. Recognition in the animals and plants diversity, special needs in specific environmental contexts. Awareness of the human role on Earth, finite resources, inequality access to them and environmentally responsible ways of life adoption

Art and image

Recognition of the environmental and artistic cultural heritage main elements, of its own territory and sensitivity to protection and conservation intervention

Technologies

Recognition of the main technological systems and of the multiple relationships they establish with living beings and with other natural elements in the surrounding environment. Transforming resources and energy forms involved. Analysis and evaluation of a technological choice possible consequences

Suggested Educational paths:

- Protected alpine natural areas
- Construction of an alpine herbarium
- Local environment and culture
- Species biodiversity and evolution in Alps
- Resistance and resilience strategies

Environmental Goals:
- Develop a systemic and complex approach to reading the territory
- Promote the ability to analyze the human activities impacts on the environment
- Acquisition of the importance to protect and conserve nature
- Acquisition of the ability to take informed choices that can change behavior daily

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders.
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions

High School

Humanitarian, Artistic and Scientific School
- Links between science and technology and their correlation with environmental development and protection models
- Sustainable development, including social, economic and political aspects, tools needed to reduce the environmental imbalances and the resources protection
- Interdependence between the science evolution and relationship with the historical, social, environmental context and the territory specificity in which each one is placed

Technical School
- Geographical, ecological and territorial aspects and their natural and anthropic care
- Connections with demographic, social economic and cultural structures and transformations occurred over time
- Use of technological tools in relation to the environment and the territory protection
- Environmental legislation related to production processes
- Ethical, social, scientific, productive and economic implications
- Environmental aspects of technological innovation and its industrial applications

Vocational School
- Geographical, ecological, territorial aspects of natural and anthropic environment
- Connections with demographic, economic, social and cultural structures and transformations occurred over time
- Technological tools and environmental and the territorial protection

Suggested Educational paths:
- Ecosystem services
- Sustainable development: environmental, economic, social and political aspects
- Green Economy and Green Jobs
- Science and technology for the environment: problems and solutions

Environmental Goals:
- Develop a systemic and complex approach about the territory and the landscape reading, highlighting the components and the relationships according to technical-scientific criteria feature
- Recognize and analyze the complex relationships between man and natural environment
- Become aware of the nature protection and conservation importance, of the ability to recruit and implement conscious choices capable to modify individual and collective behavior

Sustainable Skills:

- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

AGRO-MANAGED LANDSCAPE CONSERVATION PATHS

Farming and forestry-maintained landscape

Primary School

From curriculum

Citizenship and Constitution

Education for active citizenship. Development of a personal vision and collaborations for practicing civil cohabitation

History

Knowledge related to different energy sources use. Defense from the adverse natural elements. Food culture: heritage and common good. Goods and food conservation, labor and social differentiation, migration and territories conquest

Geography

Transformations made by man on natural landscapes. Reality from different points of view, which allow us to consider and respect multiple visions, in an intercultural approach from near to far.
Geographic space as a territorial system, consisting of physical and anthropic elements linked by connection and /or interdependence relationships

Science

Main characteristics animal and plant organisms ways of life. Social and natural environment value. Awareness of the structure and of the body development, in its various organs and apparatus and health care. Living system and its evolution over time. The human community on Earth, resources finite character and inequality at their access.

Physical education
Himself knowledge in constant relationship with the environment, the others, objects and integration in the team group

Technologies
The main technological systems and relationships with living beings and other natural elements. Resources and production of goods. Energy transformation and consumption processes, relative environmental impact

Suggested Educational paths:
- The agricultural production seasonality
- Food and Biodiversity in Alps
- Km 0
- Eco-friendly trade
- Food security
- Food and energy
- Water Proofing and water resources
- Footprint calculation
- Eco packaging

Environmental Goals:
- Health education through healthy eating
- Understand the interdependence between man, environment and health
- Train the organic farming culture to understand the earth products origin
- Understand the path of products coming from far

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to reflect on one's own role in the local community and (global) society

Secondary School
From Curriculum

Citizenship and Constitution
Education for active citizenship. Responsibility ethic acquisition. Conscious vision of shared values and of the cooperative attitudes for a civil coexistence

History
Food culture: heritage and common good. Human life problems on the planet: energy use different sources, defense against adverse natural elements, environment progressive evolution. Goods and food conservation, the labor and social differentiation division, migration territories conquest. Environmental cultural heritage

Geography
World landscapes and progressive transformations made by humans. Territorial system: physical and anthropogenic elements connection and/or interdependence. Reality from different points of view, which allow us to consider and respect multiple visions, in an intercultural approach from near to far

Science
Awareness of the structure and of body development, in its various organs and apparatus and health care. Animals and plants basic needs and ways to satisfy them. The human

community on Earth, resources finite character and inequality at their access.

Physical education
Himself knowledge in constant relationship with the environment, the others, objects and integration in the team group

Technologies
Main technological systems and multiple relationships recognition they establish with living beings and with other natural elements in the surrounding environment. Knowledge of the transforming resources and energy involved. Analysis and evaluation of technological choice possible consequences

Suggested Educational paths:
- The agricultural production seasonality
- Km 0
- Eco-friendly trade
- Food security
- Food and energy
- Water Proofing and water resources
- Footprint calculation
- Eco packaging
- Alpine food and culture from nature to the table: typical alpine dishes

Environmental Goals:
- Health education through healthy eating
- Understand the interdependence between man, environment and health
- Train the organic farming culture to understand the alpine earth products origin
- Understand the products path coming from other alpine territories

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders.
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions

High School

Humanitarian, Artistic and Scientific School
- Links between science and technology and their correlation with environmental development and protection models
- Globalization knowledge and its consequences
- Relationship between economy, environment and society, imbalances between the word regions, sustainable development (resources, climate change, nutrition and biodiversity)
- Interdependence between the science evolution and relationship with the historical, social, environmental context and the territory specificity in which each one is placed

Technical and Vocational School
- Geographic, ecological, territorial aspects of the natural and anthropic environment
- Connections with the demographic, economic, social and cultural structures and transformations occurred over time

- Regulations for person, environment and territory protection

Suggested Educational paths:
- Sustainable development: environmental, economic, social and political aspects
- Green economy and Green Jobs
- Food waste
- Alpine agricultural productions
- Km 0
- Eco-friendly trade
- Food security
- Food and energy
- Water Proofing and water resources
- Footprint calculation
- Eco packaging
- Alpine food and culture
- Economic evaluation about eco-systemic services related to food

Environmental Goals:
- Health education through healthy eating
- Understand the interdependence between man, environment, health and clime
- Train the organic farming culture to understand the alpine earth products origin
- Understand the products path coming from other alpine territories
- Promote the ability to analyze the human activities impacts on the environment
- Understand the need to reduce food packaging
- Promote the ability to read the human activities positive and negative impacts on ecosystems
- Create a strong sense of belonging to the alpine territory
- Use the knowledge to understand ecological, intercultural and civil cohabitation problems

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

CLIMATE CHANGE ADAPTATION AND MITIGATION

- Natural hazards prevention
- Mitigation measures such are energy saving and renewable
- Adaptation Measures

Primary School

From curriculum

Citizenship and Constitution
Education for active citizenship

History
Knowledge related to the different energy sources use. Defense from the adverse natural elements

Geography
Main physical geographic objects (rivers, mountains, plains, coasts, hills, lakes, seas, oceans, etc.). Landscape characters (mountain, hill, plain, volcanic, etc.). Natural landscape progressive transformations. Geographical space as a territorial system, consisting of physical and anthropic elements

Science
Air and its properties: air has a weight, air is elastic and compressible. Oxygen and combustion. Pollution. Social and natural environment value

Art and image
Recognition of the environmental and artistic cultural heritage main elements, of its own territory and sensitivity to protection and conservation intervention

Technologies
Artificial elements and phenomena in the surrounding environment. Energy transformation and consumption processes, and relative environmental impact

Suggested Educational paths:
- Pollution and environmental impact in Alps
- Calculating your own ecological footprint
- An eco-sustainable home: daily behavior for the local natural resource conservation
- Adoption of a local territory environment portion
- Renewable energy sources
- Energy saving in Alps

Environmental Goals:
- Develop a systemic and complex approach to reading the territory
- Understanding the concept of the environment as an integrated system of relationships
- Understanding the concept of interdependence between the individual and the environment
- Promote the ability to read the human activities impacts on ecosystems

- Create a sense of belonging to the territory
- Provide tools and models to actively participate in nature conservation

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Gros in the ALPS
- Be able to reflect on one's own role in the local community and (global) society

Secondary School

From Curriculum

Citizenship and Constitution
Education for active citizenship. Responsibility ethic acquisition

History
Environmental history essential processes. Hypotheses formulation and verification on the produced information and elaborated knowledge basis. Use of the learned knowledge to understand ecological, intercultural and cohabitation civil problems

Geography
Use of traditional and innovative tools to understand and communicate facts and territorial phenomena. Knowledge of landscape protection issues and problems understood as a cultural heritage and ability to plan enhancement actions.

Science
Air and its properties, atmosphere and gas atmosphere, pollution. Awareness of the human role on Earth, finite resources, inequality access to them and environmentally responsible ways of life adoption

Art and image
Environmental and artistic cultural heritage main elements recognition on its own territory and sensitivity to protection and conservation intervention

Technologies
Recognition of the main technological systems and of the multiple relationships they establish with living beings and with other natural elements in the surrounding environment. Knowledge of transforming resources main ways and energy involved. Analysis and evaluation of a technological choice possible consequences

Physical education
Himself knowledge in constant relationship with the environment, the others, objects and integration in the team group

Suggested Educational paths:
- Pollution and environmental impact in Alps
- Calculating your own ecological footprint
- An eco-sustainable home: daily behavior for local natural resources conservation
- Adoption of a local territory environment portion
- Climate and fossil fuels
- Renewable energy sources
- Energy saving in Alps
- Alpine Ecosystem services

Environmental Goals:
- Develop a systemic and complex approach to reading the territory
- Understanding the concept of the environment as an integrated system of relationships
- Understanding the concept of interdependence between the individual and the environment
- Promote the ability to read the human activities impacts on ecosystems
- Create a sense of belonging to the territory
- Provide tools and models to actively participate in nature conservation

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders.
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions

High School

Humanitarian, Artistic and Scientific School
- Links between science and technology and their correlation with the environmental development and protection models. Air composition and its properties, winds, atmosphere and layers, pollution: Greenhouse effect, ozone hole. Global warming
- Sustainable development, including social, economic and political aspects, tools needed to reduce environmental imbalances and protection of resources
- Interdependence between science evolution and relationship with the historical, social, environmental context and the specificity in which each one is placed

Technical School
- Geographical, ecological and territorial aspects and their natural and anthropic care
- Air composition and its properties, winds, atmosphere and layers, pollution: Greenhouse effect, ozone hole. Global warming
- Connections with demographic, social economic and cultural structures and transformations occurred over time
- Use of technological tools in relation to the environment and the territory protection
- Environmental legislation
- Ethical, social, scientific, productive and economic implications
- Environmental aspects of technological innovation and its industrial applications

Vocational School
- Geographical, ecological, territorial aspects of natural and anthropic environment
- Air composition and its properties, winds, atmosphere and layers, pollution: Greenhouse effect, ozone hole. Global warming
- Connections with demographic, economic, social and cultural structures and transformations occurred over time
- Technological tools and environmental and the territorial protection

Suggested Educational paths:
- Alpine Ecosystem services
- Sustainable development: environmental, economic, social and political aspects
- Green Economy and Green Jobs in Alps
- Science and technology for the environment: problems and solutions

- Climate and fossil fuels
- Renewable energy sources
- Energy saving in Alps
- Increased temperatures
- Ice melting
- Alpine catastrophic events and prevention measures

Environmental Goals:
- Develop a systemic and complex approach about the territory and the landscape reading, highlighting the components and the relationships according to technical-scientific criteria feature
- Recognize and analyze the complex relationships between man and natural environment
- Become aware of the nature protection and conservation importance, of the ability to recruit and implement conscious choices capable to modify individual and collective behavior
- Develop awareness of the rights deriving from the Aahrus Convention: guaranteeing citizens access to environmental information, encourage citizen participation in decision-making activities that can have effects on the environment

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivatte one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

NATURAL RESOURCES EXPLOITATION AND MANAGEMENT

- Wood and non-wood forest products
- Water
- Soil
- Waste

Primary School

From curriculum

Citizenship and Constitution
Education for active citizenship

History
Knowledge related to the different energy sources use. Defense from the adverse natural elements.

Geography
Main physical geographic objects (rivers, mountains, plains, coasts, hills, lakes, seas, oceans, etc.). Landscape characters (mountain, hill, plain, volcanic, etc.). Natural landscape progressive transformations. Geographical space as a territorial system, consisting of physical and anthropic elements.

Science
Idrosphere: features, marine and continental waters, water cycle. Lithosfere: soil and life plants, minerals, rocks. Main characteristics and animal and plant organism ways of life. Social and natural environment value

Art and image
Environmental and artistic heritage characteristic aspects and its conservation starting from the territory it belongs to

Technologies
Artificial elements and phenomena in the surrounding environment. Energy transformation and consumption processes, and relative environmental impact. Waste Collection, Recycling and Waste disposal

Suggested Educational paths:
- Water as a common good
- Water cycle
- Water is life
- Rivers and alpine lakes
- Recycling
- Creative workshop for recycling materials
- How to read a label
- Discovery and care of alpine territory
- Environmental Goals:
- Develop a systemic and complex approach to reading the territory
- Understanding the concept of the environment as an integrated system of relationships
- Understanding the concept of interdependence between the individual and the environment
- Promote the ability to read the human activities impacts on ecosystems
- Create a sense of belonging to the territory
- Provide tools and models to actively participate in nature conservation

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to reflect on one's own role in the local community and (global) society

Secondary School

From Curriculum

Citizenship and Constitution

Education for active citizenship. Responsibility ethic acquisition

History

Environmental history essential processes. Hypotheses formulation and verification on the basis of produced information and elaborated knowledge. Use of the learned knowledge to understand ecological, intercultural and cohabitation civil problems

Geography

Use of traditional and innovative tools to understand and communicate facts and territorial phenomena. Landscape protection issues and problems knowledge understood as a cultural heritage and ability to plan enhancement actions.

Science

Idrosphere: features, marine and continental waters, water cycle. Lithosfere: soil and life plants, minerals, rocks. Environment: organisms and plants. Complex vision acquisition about the living system and its evolution over time. Awareness of the humanrole on Earth, finite resources, inequality access to them and environmentally responsible ways of life adoption

Art and image

Environmental and artistic cultural heritage main elements recognition on its own territory and sensitivity to protection and conservation intervention

Technologies

Wood: features, property and technology. Waste Issues: waste Collection, recycling and waste disposal. Recognition of the main technological systems and of the multiple relationships they establish with living beings and with other natural elements in the surrounding environment. Knowledge of transforming resource main ways and of the energy involved. Analysis and evaluation of a technological choice possible consequences

Suggested Educational paths:

- Water as a common good
- Water cycle
- Water is life
- Rivers and alpine lakes
- Recycling
- Creative workshop for recycling materials
- Raw materials and waste cycle
- Alpine territory discovery and care

Environmental Goals:

- Develop a systemic and complex approach to reading the territory
- Promote the ability to analyze the human activities impacts on the environment
- Acquisition of the importance to protect and conserve nature
- Acquisition of the ability to take informed choices that can change behavior daily

Sustainable Skills:

- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders.
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions

High School

Humanitarian, Artistic and Scientific School

- Idrosphere: features, marine and continental waters, water cycle. Lithosfere: soil and life plants, minerals, rocks. Soil, water, energy consumption. Mobility, waste and recycling
- Links between science and technology and their correlation with the environmental development and protection models
- Sustainable development, including social, economic and political aspects and the tools needed to reduce environmental imbalances and the resources protection
- Interdependence between the science evolution and relationship with the historical, social, environmental context and the territory specificity in which each one is placed

Technical School

- Idrosphere: features, marine and continental waters, water cycle. Lithosfere: soil and life plants, minerals, rocks. Soil, water, energy consumption. Mobility, waste and recycling
- Geographical, ecological and territorial aspects and their natural and anthropic care
- Connections with demographic, social, economic and cultural structures and transformations occurred over time
- Use of technological tools in relation to the environment and the territory protection
- Environmental legislation related to production processes
- Ethical, social, scientific, productive and economic implications
- Environmental aspects of technological innovation and its industrial applications

Vocational School

- Idrosphere: features, marine and continental waters, water cycle. Lithosfere: soil and life plants, minerals, rocks. Soil, water, energy consumption. Mobility, waste and recycling
- Geographical, ecological, territorial aspects of natural and anthropic environment
- Connections with demographic, economic, social and cultural structures and transformations occurred over time
- Technological tools and environmental and the territorial protection
- Suggested Educational paths:
- Recycling
- Creative workshop for recycling materials
- Raw materials and waste cycle
- Discovery and care of alpine territory
- Ecosystem services
- Sustainable development: environmental, economic, social and political aspects
- Green Economy and Green Jobs
- Science and technology for the environment: problems and solutions

Environmental Goals:

- Develop a systemic and complex approach about the territory and the landscape reading, highlighting the components and the relationships according to technical-scientific criteria feature

- Recognize and analyze the complex relationships between man and natural environment
- Become aware of the nature protection and conservation importance, of the ability to recruit and implement conscious choices capable to modify individual and collective behavior
- Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

SOCIO-ECONOMIC QUALITY OF LIFE PATHS

- Ecosystem Service Assessment Payment
- Eco- Innovation
- Creating Green Jobs
- Multifunctional sustainable agriculture
- Sustainable Forestry
- ICT Industrial Sector
- Tourism, Sport and leisure economy

High School

Humanitarian, Artistic and Scientific School

- Links between science and technology and their correlation with the environmental development and protection models
- Globalization knowledge and its consequences
- Relationship between economy, environment and society, imbalances between the world regions, sustainable development (resources, climate change, nutrition and biodiversity)
- Interdependence between the science evolution and relationship with the historical, social, environmental context and the specificity of the territory in which each one is placed

Technical and Vocational School

- Geographic, ecological, territorial aspects of the natural and anthropic environment
- Connections with the demographic, economic, social and cultural structures and transformations occurred over time
- Regulations for person, environment and territory protection

Suggested Educational paths:

- Sustainable development: environmental, economic, social and political aspects
- Alpine agricultural productions and Km 0
- Green Skill for Green Jobs: sustainable and innovative business simulation
- Ecosystem service economic evaluation
- Eco-friendly trade
- Food security in Alps
- Green Economy and energy
- Water Proofing and water resources
- Corporate responsibility and sustainability report
- Training work experiences in alpine territory
- Five possible Green Jobs: Eco-Lawyer, Botanic Alpine Guides, Bio-Engineer, Green Designer, Green Chemist
- Environmental information and Open data

Environmental Goals:

- Develop a systemic and complex approach about the territory and the landscape reading, highlighting the components and the relationships according to technical-scientific criteria feature
- Recognize and analyze the complex relationships between man and natural environment
- Become aware of the nature protection and conservation importance, of the ability to recruit and implement conscious choices capable to modify individual and collective behavior
- Develop awareness of the rights deriving from the Aahrus Convention: guaranteeing citizens access to environmental information, encourage citizen participation in decision-making activities that can have effects on the environment
- Train the organic farming culture to understand the alpine earth products origin
- Understand the products path coming from other alpine territories
- Promote the ability to analyze the human activities positive and negative impacts on the environment
- Create a strong sense of belonging to the alpine territory
- Use the knowledge learned to understand ecological, intercultural and civil cohabitation problems

Sustainable Skills:

- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

CULTURE HERITAGE PRESERVATION

- Conservation of History
- Identity awareness construction

Primary School

From curriculum

Citizenship and Constitution
Education for active citizenship

History
Environmental cultural heritage. Food culture: heritage and common good. Human life problems on the planet: different energy sources use, defense against adverse natural elements and environment progressive evolution. Goods and food conservation, labor and social differentiation division, migration territories conquest. Development of a personal vision and collaborations for practicing civil cohabitation

Geography
Main physical geographic objects (rivers, mountains, plains, coasts, hills, lakes, seas, oceans, etc.). Landscape characters (mountain, hill, plain, volcanic, etc.). Natural landscape progressive transformations. Geographical space as a territorial system, consisting of physical and anthropic elements.

Science
Animal and plant organisms main characteristics ways of life. Social and natural environment value

Art and image
Environmental and artistic heritage characteristic aspects and its conservation starting from the territory it belongs to

Technologies
Artificial elements and phenomena in the surrounding environment. Energy transformation and consumption processes, and relative environmental impact

Suggested Educational paths:
- Alpine traditional dishes
- Values and alpine traditions
- Cultural diversity and diversity in alpine nature
- Food and biodiversity in the Alps
- Protected natural areas

Environmental Goals:

- Develop a systemic and complex approach to reading the territory
- Understanding the concept of the environment as an integrated system of relationships
- Understanding the concept of interdependence between the individual and the environment
- Promote the ability to read the human activities impacts on ecosystems
- Create a sense of belonging to the territory
- Provide tools and models to actively participate in nature conservation
- Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to reflect on one's own role in the local community and (global) society

Secondary School

From Curriculum

Citizenship and Constitution

Education for active citizenship. Responsibility ethic acquisition. Conscious vision of shared values and of the cooperative attitudes for a civil coexistence.

History

Environmental culture heritage. Food culture: heritage and common good. Human life problems on the planet: different energy sources use, defense against adverse natural elements e environment progressive evolution. Goods and food conservation, labor and social differentiation division, migration territories conquest.

Geography

Use of traditional and innovative tools to understand and communicate facts and territorial phenomena. Landscape protection issues and problems knowledge understood as a cultural heritage and ability to plan enhancement actions

Science

Acquisition of the living system complex vision and its evolution over time. Recognition in animals and plants diversity, special needs in specific environmental contexts. Awareness of the humans role on Earth, finite resources, inequality access to them and adoption of environmentally responsible ways of life

Art and image

Environmental and artistic cultural heritage main elements recognition on its own territory and acquired sensitivity to protection and conservation intervention

Technologies

Recognition of the main technological systems and of the multiple relationships they establish with living beings and with other natural elements in the surrounding environment. Knowledge of transforming resources main ways and energy involved. Analysis and evaluation of a technological choice possible consequences

Physical education

knowledge in the constant relationship with the environment, the others, objects and integration in the team group

Suggested Educational paths:
- Alpine traditions and values
- The agricultural production
- Historical and artistic paths
- Alpine food and culture from nature to the table: typical alpine dishes

Environmental Goals:
- Develop a systemic and complex approach to reading the territory
- Promote the ability to analyze the human activities impacts on the environment
- Acquisition of the importance to protect and conserve alpine nature
- Acquisition of the ability to take informed choices that can change behavior daily
- Create a sense of belonging to the territory
- Understand the interdependence between man and environment
- Train the organic farming culture to understand the alpine earth products origin

Sustainable Skills:
- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders.
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions

High School

Humanitarian, Artistic and Scientific School
- Links between science and technology and their correlation with the environmental development and protection models
- Globalization knowledge and its consequences
- Relationship between economy, environment and society, imbalances between the world regions, sustainable development (resources, climate change, nutrition and biodiversity)
- Interdependence between the science evolution and relationship with the historical, social, environmental context and the territory specificity in which each one is placed
- Technical and Vocational School
- Geographic, ecological, territorial aspects of the natural and anthropic environment
- Connections with the demographic, economic, social and cultural structures and transformations occurred over time
- Regulations for person, environment and territory protection

Suggested Educational paths:
- Sustainable development: environmental, economic, social and political aspects
- Alpine Culture and Traditions: Skiing and other Sports, Music, Folklore, Art
- Alpine agricultural productions
- Alpine food and culture
- Alpine churches trough the history

Environmental Goals:
- Develop a systemic and complex approach about the territory and the landscape reading, highlighting the components and the relationships according to technical-scientific criteria feature
- Become aware of the nature protection and conservation importance, of the ability to recruit and implement conscious choices capable to modify individual and collective behavior

- Train the organic farming culture to understand the alpine earth products origin
- Promote the ability to analyze the human activities positive and negative impacts on the environment
- Create a strong sense of belonging to the alpine territory
- Use the knowledge to understand ecological, intercultural and civil cohabitation problems

Sustainable Skills:

- Be able to motivate and facilitate sustainability assessment and problem solving
- Be able to apply participatory methods for collaborating with diverse Stakeholders
- Be able to work in teams and understand diversity among cultures and social Groups in the ALPS
- Be able to structure uncertain information about the future into plausible future scenarios
- Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals
- Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different actors in ALPS.
- Be able to address relevant sustainability aspects with the project executive and stakeholders
- Be able to think about a problem critically and globally
- Be able to reflect on one's own role in the local community and (global) society
- Be able to evaluate and further motivate one's actions
- Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

Annex 3- Tools for Learner-centered methodologies

EAS- Design Format

EAS		
Teachers		
Title		
Target		
Goals		
Step	**Design**	**Time**
Preparatory		
Operational		
Restructuring		
Evaluation		

Table 8 – EAS design format

EAS - Assessment and grading criteria

KEY COMPETENCES	DIMENSIONS (TASK-COMPETENCE CONTENT)	CRITERIA (GOALS, WHAT A STUDENT SHOULD BE ABLE TO DO)	INDICATORS (WHAT TEACHER OBSERVE FOR EACH STUDENT)	LEVELS (BASIC, INTERMEDIATE AND EXPERT)	EAS (MICROACTIVITY TO BE DONE)

Table 9 – EAS Assessment form

Flipped Classroom - Design Format

FLIPPED CLASSROOM		
Teachers		
Title		
Target		
Goals		
Step	Design	Time
Activation		
Production		
Processing		
Evaluation		

Table 10– Flipped classroom design form

FC- Assessment and grading criteria

KEY COMPETENCES	DIMENSIONS (TASK-COMPETENCE CONTENT)	CRITERIA (GOALS, WHAT A STUDENT SHOULD BE ABLE TO DO)	INDICATORS (WHAT TEACHER OBSERVE FOR EACH STUDENT)	LEVELS (BASIC, INTERMEDIATE AND EXPERT)	FC (ACTIVITY TO BE DONE)

Table 11– Flipped classroom Assessment form

Self evaluation

Center Work Rubric		
		
I completed my work.	Some of my work is incomplete.	I did not complete my work at all.
My work is done correctly.	Some of my work is done incorrectly.	I did not do my work correctly at all.
My work is deat and tidy.	Some of my work is neat and tidy.	My work is not neat and tidy at all.
I put my BEST work and effort in my center work.	I put some effort in my center work.	I did not put any effort in my center work.

Table 12– EAS and Flipped Classroom Self-evaluation rubric

Observation Sheet Cooperative learning

Start by teaching one skill and observing for it. Show students how well they do in practicing that skill; praise and otherwise reward their efforts. When they have mastered one skill, add and teach a second skill, etc.

Date _____ Period _____ Observer _____

Skills	Group Members			

Table 13 - Other Observation Notes

Other evaluation rubrics at:
http://www.lapresenter.com/coopevalpacket.pdf

Annex 4 – Examples of non- formal educational activities for schools

Key Issue	Targets	Tipology of activity	Goals	Actions
Climate change	For high schools	Scientific Projects to document climate change in high altitudes. Students collect and document scientific indicators of climate change and carry out a survey with NF operators.	• challenge students to obtain scientific data in the field until they are used, meet actors, trades around a shared structure: Regional and National Park, • become aware of the interdependence of actors, resources and climatic conditions, • become aware of the reality of global warming through a local example.	The work should focus on: • obtaining data (choice of parameters measured / observed, choice of sites, problems encountered, limits ...), • the sorting of the data (aberrations, choice, distribution, validation), • the organization of data (tables, graphs, averages, smoothing), • their cross-use in solving problems (year 2003, 2011 compared to others for example), • study facilities set up on the meadow to follow the snow removal and phenology of the vegetation.
	For Grammar and secondary schools	Research-education cooperation programs and project. Discovering and experiencing climate change from different perspectives. Educational potential: learning-on-site to better understand climate change in the alpine mountains.	In the context of global change, education in geography, economics, and other subjects has the responsibility to foster competencies that enable young people to cope with the challenges of the 21st century. By combining inter- and transdisciplinary approaches with the theory of moderate constructivism, a theoretical basis is formed that facilitates the practical configuration of the setting.	Further education for teachers. The main interests are identified by accompanying analyses and interviews and are included in the further development of the project. The integration into everyday school life is a central part of the concept. It starts with a kick-off workshop and involves individual contributions by students in different subjects, doing an "alpine research week" in the mountains.
Societal identity Resilient cohesive cooperative communities	All	Sites and practices for people in difficult situations like social exclusion, school failure, illness or disability, to help them find a motivation to overcome this situation	Establish access to the mountains for people as a great asset and an important factor in psychological and physiological health treatments and allow social integration	

Key Issue	Targets	Tipology of activity	Goals	Actions
Quality education	College and post-graduate school	Interdisciplinary practices and training	Innovative training for study and analysis of issues regarding mountain areas	Conservation and sustainable development of mountain areas Land and landscape restoration and enhancement Environmental and land planning engineering Agricultural and agro-environmental sciences Mountain forestry Protection and management of food farming chain Project management for mountain areas
	Secon-dary scholl	Interdisciplinary school project (Geography, History, Italian, Science, Technology and Physical Education)	The main educational goal is to develop territorial awareness among young people of the enhancement and protection of the cultural and environmental heritage of our country, for the promotion of knowledge of and respect for environmental values in the Alpine region, which is fundamental for its defense from the environmental challenges of the present. The goals to be achieved are: - Knowledge and protection of the Alpine environment, - Personal development of the young regarding their specific alpine identity, - Increase the awareness of historical and social identity and promote civic education, - Character building and development of communication and social skills.	The planning of teaching focus on the landscape and the territory in partnership with museums to jointly plan activities, courses, and initiatives aimed at focusing classroom lessons on local cultural and natural heritage. The project is based on an educational approach involving both lessons with experts (geologists, glaciologists, architects, engineers, artisans, farmers, mountain guides, hiking guides, Alpine rescue) and fieldwork (4 field trips per year). Activities are different depending on the year of study: FIRST YEAR: "Time and territory": observing the nature and the morphology of our territory to understand the transformations that have occurred over the years. SECOND YEAR: "Man and territory": to deepen the relation between our territory and human activities, analyzing changes humans have left on the territory. THIRD YEAR: "History and territory": our territory preserves the remains of some of the most tragic events of the First World War. In the third year we explore the role of military architecture and the strategic position of our territory.

Key Issue	Targets	Tipology of activity	Goals	Actions
	Activities for children in kindergartens, primary and secondary schools	Educational programmes that are compatible with curricula. Center with accommodation, meals, equipment and qualified teachers	Contents based on the curricula of kindergartens, primary and secondary schools with "outdoor" pedagogic-didactical methods and approaches. Goal is to achieve knowledge and skills in the fields of environment, natural and cultural heritage and sustainable development. The long-term impact of this kind of activities is building a positive and responsible attitude towards the environment. Through a healthy diet and athletic activities, participants work on a positive self-image, friendship, cooperation and tolerance.	Mountain-oriented educational activities are connected with knowledge and skills in the fields of alpine biodiversity, adaptations of organisms to the alpine environment, alpine ecosystems analysis and monitoring, pollution of alpine ecosystems (especially water, soil and air), limitations in protected areas. single day activities: science and technical days, field trips – one-week activities: • Outdoor schools with plenty of athletic activities (skiing, rafting, cycling, hiking, mountain climbing) • Project activities, dealing with healthy lifestyles, biodiversity, ecosystems, natural and cultural heritage, water cycle, orientation ... • Pupils' and students' holiday activities • They offer athletic activities such as hiking, mountain climbing, rafting, canoeing, cycling, skiing, cross country skiing and swimming. The safety of all participants is a vital component of all activities.
	children, youth, kindergartens, schools, families and the wider community	Forest Kindergartens and Schools systematically implements forest pedagogy in the curricula. The goals of this initiative are achieved through various projects and beneficial activities. The forests are the main site of the education measures	The main purpose is to encourage schools and kindergartens to maximize the use of the local natural environment for educational purposes, exchange of knowledge, good practices The transfer of knowledge and skills to reality and the possibility of using them outside of school, in the forest, the children not only deepen their knowledge of nature, but also develop their individual abilities in the best possible way. Furthermore, the entire class develops as a group and the social network is strengthened.	The use of the nearby forest or natural environment, which is selected on the basis of criteria such as accessibility, health, and safety; Regular, frequent visits to the forest (natural environment) weekly or fortnightly for kindergartens and monthly for the schools, all-year-round; The activities tak- into account the abilities of the children and their individual characteristics; Exploring and learning has the characteristics of open learning; Everybody feels good in a natural environment, including the teaching staff. Moving the class outside, Learning songs on the meadow, Repeating multiplication under a tree, Taking a group of children out of the kindergarten to the forest and creating a forest playground, Teaching them the ABCs - of nature, Helping children achieve their goals, Using the forest as a learning tool, Creating a network of local natural environments for learning.

Key Issue	Targets	Tipology of activity	Goals	Actions
	All school grades	Parks nature experience centres for environmental education with residence which coordinates activities for environmental education and environmentally compatible nature- expe-rience-tourism	Increase competence to find solutions for complex challenges (e.g. with programs about energy/ climate, ecological footprint, globa-lization by the example of mobile phones etc.	Programmes for schools: 2 hours or nature-experience-programmes taking several days • Indoor activity room groups meet for group lessons in the education center. • Vacation programmes (day-care programmes taking several days (e.g. camping, tours) • exciting youth-wilderness-camp (5 days) • Training and workshops for nature lovers, forest owners, environ-mental educators. "Explorer week" for different schools as 2-3 day programmes. "Media camp": 4 day event for teena-gers between 13 and15 years of age in the summer holidays (incl. 2 day excursion to the National Park)
	Primary schools		The kids should establish a positive relationship towards nature as early as possible. Further goals are communicating environmental education idea, enhancing the understanding for protection measures, and promo-ting a sustainable lifestyle	Children groups weekly meetings They explore and discover nature in their local environment, experience the different seasons, play, do handicrafts, build camps and much more. The kids are usually part of the group for several years, which enables a continuous and sustainable education and, by including the whole family, contributes to a higher acceptance of the nature.
	Primary school and midd-le school	"Naturpark-Schule"	Goal is to raise awareness of the value of the protectorate within long-term cooperation between the school and the nature park.	The subject "nature" is integrated in the curriculum of regular classes (e.g. mathematics class in the woods, all classes visit the nature park-office, old handicraft is practically implemented in the nature park). Nature park schools are linked and developed through an informal cooperation between partners like School authorities, college of educa-tion (school for teachers), college for agrarian and environmental education, association of the nature parks, nature park societies, nature park communi-ties, nature park schools. Main contents: • Attending school development • Linking between schools • Advanced training for teaching staff and nature park guides • Integration and linking on the official e-platform

Key Issue	Targets	Tipology of activity	Goals	Actions
Multifunctional sustainable agriculture Farming and forestry maintained landscape	Primary schools	Programs in education for children by sensitising them to the world of alpine pastures and mountain farming with their (cultural) heritage, landscapes, flavours and images.		
Clean water and sanitation	High schools	Fieldworks on analysis and evaluation of the water quality level by considering significant parameters.		This activity is repeated twice every year (in autumn and in spring) to show how these parameters change over the year. The activity is carried out at two collection points. Students evaluate the concentration of nitrogen, phosphates, PH and temperature at two different water levels (namely the water surface and at a water depth of 8 metres). Two samples are collected at different points and then analysed at the school's laboratory with appropriate instruments. For each parameter, a form is completed to report on the concentration and measurement method.
Energy efficiency and renewables Cultural heritage preservation Responsible consumption and production	High school	The project provides students with the relevant competencies to plan the rebuilding of a refuge in a mountain territory.	Leading students in specific knowledge about: the local technical conditions of the building and the environmental context of the area how to develop a project of refurbishment of building/refuge in cooperation with the public institutions considering environmental characteristics of the territory and technical specifications of the structure.	Using software for architectural design as well as photo editing and improving their presentation skills Activities: • 2 surveys • Meetings with the director of Park • to explain problems related to interventions on buildings in protected areas • Laboratory activities (20 hours) • Final presentation of the project (4 hours)

Key Issue	Targets	Tipology of activity	Goals	Actions
Biodiversity species conservation	Secondary schools	Educational activities to promote the overall knowledge on alpine species conservation: biological characteristics, importance of natural habitat and behaviour to preserve species. Encourage people to collect and report data on the presence of animal species in the network of Protected Areas.	The goal of these activities, which will be carried out in the area of National and regional parks is to increase students' awareness of the importance of large carnivores and its role in the alpine ecosystem. The aims of this educational and teaching activity are: 1. Increase people's awareness on the value of Protected Areas in protecting the environment and increase biodiversity 2. discover the importance of monitoring activities for protecting the environment 3. Promote citizen science and its goals 4. Promote environmental education with scientific experts in the field of biodiversity for the broad public.	The educational activities are articulated in the following ways: 1) Competition between schools regarding the preparation of an artistic or multimedia product on the preservation of the brown bear. 2) Distribution of information on this project at local schools to promote the its goals and activities; 3) Training activities for teachers and field visits with students. 4) Final dissemination events with the participation of students and their families. Students are followed by experts to help them detect ant recognize the most interesting species, photograph animals and plants and return data on a web platform. The innovative points of this activity are the involvement of citizens and students in a participating process for evaluating and monitoring: ï Knowledge and protection of the alpine environment and its habitat. ï Personal development in relation to the specific identity of its home area. ï Increase the awareness on natural mountain identity and promote monitoring actions. ï Responsible use of digital platforms.
Smart and sustainable economies Social local identity Quality education	High schools	School curricula on educational programs "nature preservation" and "agricultural-entrepreneurial technician.	Students combine the knowledge and skills needed for survival in Alpine region with tradition and sustainable development. As the employment opportunities of these young people are limited, they try to develop their interests and skills in a way that will help them with their chosen profession. This requires a very practical approach to their education, relevant knowledge and skills, innovative and modern pedagogic-didactical methods.	MOE contents are taught as part of the general subjects and as part of VET modules, where the emphasis is placed on the protection knowledge in the fields of protection of natural values, ecosystems, eco-remediation and activities in the environment, ecological analysis and monitoring, guidance in nature and organic agriculture, business opportunities, offered by local environment A portion of VET module takes place outdoors (local environment) or in a laboratory; teachers can also cooperate with various local clubs (fishermen, hunters). Students also obtain MOE knowledge and skills through field trips, camps, project days (focusing on a particular issue each)
Sport and leisure education	Young people leisures	Training programs for FREERIDE and CLIMBING	Educational tasks: young people need the experience of risks to develop individual responsibility and self-reliance, by the transfer of knowledge	Key activities are training camps (5 days each) on different levels where free riders and climbers get alpine-technical knowhow and get to work on their individual strategy for risk optimisation.

Key Issue	Targets	Tipology of activity	Goals	Actions
Regional cooperation	Interna-tional age youth	"Youth at the Top" is an international project: in several protected alpine areas and natural sites, young people walk and share a physical, human, cultural and artistic experience in the mountains at a common annual date near a summit or a refuge, including various activities such as rock painting, land art, writing, wood carving, light painting, tales, treasure hunting, stargazing, climbing peaks, solidarity actions, meetings with mountain players.	Aim at creating links between the different countries and symbolical-ly go beyond administrative and language barriers by considering the Alps as a sole region.	• Setting up a collective operation with great symbolic impact • Reinforcing mountain culture in young people as well as their feeling of belonging to the area • Strengthening their relationship with nature and the protected areas • Enabling the young people of the area to "experience" mountain nature & giving youngsters who are not necessarily familiar with it the opportunity to try out and experience the mountain environ-ment (experiencing a night in a refuge, etc.) • Mobilizing alpine players by means of an original, unifying operation • Enabling the greatest number of young people possible (access for all) to take part in the long run. • Setting up a convivial project which has a pleasurable side and creates a social link in the valley

Table 14– Examples of non-formal activities

Annex 5 - Alpine School Model Certification Charter

Partnership Structure

Partnership role	Organization name
Coordinator	
Partner 1	
Partner 2	
Partner 3	
Partner 4	
Partner 5	
Partner 6	
Partner 7	
Partner 8	
Partner 9	

Self evaluation

Organization Official extended Name	
School/Non-formal education organization	
Legal address	
Postal address	
Name of the legal reference person	
Functional role in the organization	
Telephones, Fax (with area prefix)	
E-mail, web-site	
Name of the administrative responsible	
Name of responsible of didactical aspect	
E-mail address of the responsible person/persons	

Partner information Sheet (copy and past for the number of partners)

1	Organization Name	
2	Legal address	
3	Postal address	
4	Name of the legal reference person	
5	Functional role	
6	Telephones, Fax (with area prefix)	
7	E-mail, web-site	
8	Name of the administrative responsible	
9	Name of responsible of didactical aspect	
10	E-mail address of the responsible person/ persons	

The legal responsible of the partnership SEEN what presented in the Certification Toolkit document:

- Expresses the interest of the partnership in following the Alpine School Model Certification for the period of :
  One school year ..... (please indicate the school year)
  Two school years ..... (please indicate the school year)

- Expresses the interest to receive the documentation of support, the ASM Toolkit and the annual certification label for each of the partners involved,

- Declares his/her intention in committing with the Alpine School Model mission and in fulfilling the requirements and the indicated procedure for the certification,

- Commits in presenting an extensive report at the end of certification process period showing how the ASM indications were integrated in a subjective and creative way in an original declension,

- Agree with the use of references and data for the project purposes

The undersigned authorizes the processing of personal data pursuant to Law ..... and declares under his own responsibility that everything corresponds to the truth.

_____

(Coordinator Signature, seal)

_____

(Name and job title of the undersigned)

Annex 6 – ASM unity of Learning form

Title of the project

Photo gallery

Thematical frame

ASM Pillar Macro-issues Key alpine SD Issue

FORMAL and NON-FORMAL organizations involved

List of involved schools and non-formal organization

Role of each in the design/planning/implementation/reporting of the activities

SD VALUES

LEARNING GOAL/OUTCOMES

(Identifying what students will understand about the topic as a result of this unit)
National curricula should be referenced
Formal competencies (knowledge, skills, attitudes)
Integration of SD non-formal competences (knowledge, skills, attitudes)

DESCRIPTION

Unit of Learning structure
(phases of the project/times/structure in activities)

Activity description

Outdoor activities

Tools and materials description

Project STRATEGIES
Strategies, methods, techniques overview and detail of each activity
Cross-curricular strategies Inclusion of school subjects for the development of the SD topics
Interdisciplinary development of the topics Topics and sub-topics mindmap
Contact with other transnational organizations
Governance aspects: take actions initiatives
Project QUALITY improvement
Educator training in ESD, MOE, Learner-centered methodologies, Outdoor activities
Documented use of AlpsApp Toolkit

Table 15– ASM Unity of learning form

Annex 7– Competences evaluation scheme

SD Competence Assessment							
Competences	Anticipatory	Normative	Strategic	Collaboration	Systems thinking	Self-awareness	Integrated Problem - Solving
Basic	- Know models and a for sustainability impact analysis	- Be able to assess the (un-)sustainability of current and future states of social ecological systems, and to create and craft sustainability visions for these systems	-Be familiar with concepts and methods for strategy building -Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different Societal actors in ALPS	-Be able to motivate and facilitate sustainability assessment and problem solving	-Know the key sustainability issues and the developments causing these Sustainability issues - Know the actions, interests and mandates of key stakeholders in the problem constellation - Understand the role of technology in sustainability	-Understand one's own role in the local community and (global) society -Be active in environment	- Know different problem-solving frameworks related to sustainability problems and develop viable -Be able to think about a problem critically and globally -Be open to varying perspectives
Intermediate	-Know models and a for sustainability impact analysis -Be able to structure uncertain information about the future into plausible future Scenarios	- Be able to assess the (un-)sustainability of current and future states of social ecological systems, and to create and craft sustainability visions for these systems -Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals	-Be familiar with concepts and methods for strategy building -Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different Societal actors in ALPS - Be able to address relevant sustainability aspects with the project executive and stakeholders	-Be able to motivate and facilitate sustainability assessment and problem solving -Be able to apply participatory methods for collaborating with diverse stakeholders	-Know the key sustainability issues and the developments causing these Sustainability issues -Know the actions, interests and mandates of key stakeholders in the problem constellation -Understand the role of technology in sustainability -Understand the relations between intermediate and root causes of complex (Sustainability) problems -Be able to think about a problem critically and globally	-Understand one's own role in the local community and (global) society -Be active in environment - Be able to reflect on one's own role in the local community and (global) society	- Know different problem-solving frameworks related to sustainability problems and develop viable - Know inclusive and equitable solution options -Be able to think about a problem critically and globally -Be able to motivate and facilitate sustainability assessment and problem solving -Be open to varying perspectives

SD Competence Assessment							
Expert	-Be able to structure uncertain information about the future into plausible future scenarios -Accept responsibility for the (sustainability aspects) of the project's process and output/ outcome	- Be able to assess the (un-)sustainability of current and future states of social ecological systems, and to create and craft sustainability visions for these systems -Be able to collaborate with stakeholders to specify, negotiate, and apply sustainability values, principles, objectives, and goals -Be open to different cultures	-Be familiar with concepts and methods for strategy building -Be able to use methods for designing, testing, implementing, evaluating, and adapting policies, programs, and action plans in collaboration with different Societal actors in ALPS - Be able to address relevant sustainability aspects with the project executive and stakeholders - Be committed to integrity and ethics - Be open to varying perspectives - Be willing to act despite inconclusive or incomplete information	-Be able to motivate and facilitate sustainability assessment and problem solving -Be able to apply participatory methods for collaborating with diverse Stakeholders. -Be able to work in teams and understand diversity among cultures and social Groups in the ALPS -Embrace diversity among cultures and social groups	-Know the key sustainability issues and the developments causing these Sustainability issues - Know the actions, interests and mandates of key stakeholders in the problem constellation - Understand the role of technology in sustainability -Understand the relations between intermediate and root causes of complex (Sustainability) problems -Be able to think about a problem critically and globally -Think Global act Local	-Understand one's own role in the local community and (global) society -Be active in environment - Be able to reflect on one's own role in the local community and (global) society - Be able to evaluate and further motivate one's actions -Deal with one's feelings and desires	- Know different problem-solving frameworks related to sustainability problems and develop viable - Know inclusive and equitable solution options - Understand the role of technology in sustainability -Be open to varying perspectives -Be open to varying perspectives -Be able to think about a problem critically and globally -Be able to motivate and facilitate sustainability assessment and problem solving -Be able to apply different problem-solving frameworks to complex sustainability problems and develop viable

Table 16– Scheme of SD competences Assessment - FLA adaptation from G. Silvius format

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