Environmental Literacy Handbook
The ´Greenworld - Think Green for the world´ project, addressed in this book, is co-funded by the ERASMUS+ programme of the European Union. The European Commission is not responsible for any uploaded or submitted content. Such content expresses the views of its author(s) only.

Bibliographische Information Der Deutschen Bibliothek


Alle Rechte, auch auszugsweisen Nachdrucks, der fotomechanischen Wiedergabe (einschließlich Mikrokopie) sowie die Auswertung durch Datenbanken vorbehalten.
# Table of Contents

1. Part A – Information on the project GREENWORLD 7  
   1.1 Youth Education in Europe 7  
   1.2 The project Greenworld – Aims, core ideas structure and concept 11  
   1.3 References 19  
2. Part B – The informative six modules of the Greenworld project 21  
3. Module 1: Eco Innovation and Sustainability Design in Green Entrepreneurship 23  
   3.1 Green Entrepreneurship and Entrepreneurship Education 24  
   3.2 Eco innovation in Europe 31  
   3.3 The importance of Sustainability 33  
   3.4 Eco innovation, Sustainability and Green Entrepreneurship 35  
   3.5 Learning outcome Matrice for Module 1 38  
   3.6 References 39  
4. Module 2: Natural Resource Management and Sustainability and Green Innovation in Green Entrepreneurship 42  
   4.1 Introduction to innovation for sustainability and green entrepreneurship 43  
   4.2 How to become a green entrepreneur and manage natural resources sustainably in a company 43  
   4.3 Build a new Sustainable Company, Product, Service, or Innovative Business 44  
   4.4 Turn Your Company into a Green Enterprise 45  
   4.5 Benefits of sustainable resource management 46  
   4.6 Example of the role of the government in natural resource management 47  
   4.7 Green Tourism, examples of green entrepreneurship using natural resources 47  
   4.8 Learning outcome Matrice for Module 2 48  
   4.9 References 49  
5. Module 3: User Experiences of Green Companies 51  
   5.1 Introduction 51
5.2 Green Companies and Companies evolution to ‘green’: 52
5.3 Consumer Behaviours based on ‘Green Companies’ 53
5.4 Effects of Greenwashing on Consumer Behaviours 55

6. Module 4: Developing and analyzing access to finance for Green Entrepreneurs 59
6.1 Introduction 59
6.2 Specification of Elements to Learn 60
6.3 Best Practices in Green Entrepreneurship Across Germany, Romania, Portugal, and Turkey 61
6.4 Importance of Developing and Analyzing Access to Finance for Green Entrepreneurs 62
6.5 Conclusion 63
6.6 References 65

7. Module 5: Green Entrepreneurship Culture and Business Models ideas 66
7.1 Who is an Entrepreneur 66
7.2 Green Entrepreneur Definition 66
7.3 Who is a Green Entrepreneur. 66
7.4 Key Characteristics of a Green Entrepreneur 67
7.5 The Importance of Green Entrepreneurship 68
7.6 Green Entrepreneur Characteristics 69
7.7 Key Characteristics of an Entrepreneur 69
7.8 Key differences between the Entrepreneur and the Green Entrepreneur. 70
7.9 Green Culture for the Future 71
7.10 How to Create a Green Culture 71
7.11 Business Model Development 73
7.12 What are Green Entrepreneur Supports. 74
7.13 Business Ideas Around the World 75
7.14 Green Entrepreneur Business Ideas 76

8.1 Basic approaches of the Greenworld Curriculum

8.2 Didactic und curricular conception of the modules and the Learning Outcome Matrices

Module 2: Natural Resource Management and Sustainability in Green Innovation

Module 3: User Experiences of Green Companies

Module 4: Developing and Analysing Access to Finance for Green Entrepreneurs

Module 5: Green Entrepreneurship Culture and Business Models Ideas
Abbreviations

cf. cited from
CSR Corporate Social Responsibility
ECO-AP Eco-innovation Action Plan
EE Entrepreneurship Education
ETAP Environmental Technologies Action Plan
EU European Union
GEO Green Entrepreneurial Orientation
Greenworld Erasmus+ - project “Think green for the world”
Ibid. abbreviation for the Latin word ibidem, meaning ‘in the same place’
IK Ingenious Knowledge
IT Information Technology
Ltd. Limited
PR Project Result
SBMI Sustainable Business Model Innovation
UPB University of Paderborn, Chair Business and Human Resource Education II
UN United Nations
UNICEF United Nations Children’s Fund
VET Vocational Education and Training
Environmental Literacy Handbook

GREENWORLD expected results:

PART ONE- INTRODUCTION TO THE TOPIC

PART TWO- Specification of the elements to learn under this topic including learning tasks:

A- ENVIRONMENTAL ETHICS

B- HUMAN-CENTRED ETHICS

C- LIFE-CENTRED ETHICS

D- ECOCENTRIC ETHICS (HOLISTIC ENVIRONMENTAL ETHICS)

E- OTHER ENVIRONMENTAL ETHICS APPROACHES

PART THREE- Best practices we have in our institution, in our city or country even in the partners’ countries

PART FOUR- Links to videos and further reading sources for the content of module

PART FIVE- The importance of the module in Youth Education

PART SIX- Implementation activities for the content of module

PART SEVEN- You can include a self-Check for the learner at the end, a checklist about competences they have got from the module.

PART EIGHT- Conclusion

REFERENCES
1. ENVIRONMENTAL LITERACY HANDBOOK

Foreword

The Thinking Green Center's impact can be significantly amplified by incorporating an environmental literacy handbook as a supportive element. This intellectual output will be developed using a sequential, four-stage methodology that integrates both technical and operational considerations. First, a thorough analysis will be conducted to understand the target audience's existing environmental knowledge, their specific needs, and the learning objectives the handbook aims to address. Based on this analysis, the development stage will involve crafting content that leverages best practices in environmental education and climate change communication. To ensure the handbook's effectiveness, a verification and testing stage will follow. This may involve pilot testing with a representative sample of the target audience and incorporating feedback from environmental education and youth development specialists. Finally, upon successful testing and revision, the application stage will see the finalized handbook implemented within the green youth center's programs. This may involve training facilitators, disseminating the handbook to participants, and monitoring its impact on participants' environmental literacy.

a. GREENWORLD expected results:

Thinking Green Center Model Development and Implementation:

This project will establish a green youth center model, grounded in local practices and validated through testing. Partners will collaboratively define the model's core components, including:
Environmental Literacy Handbook: This comprehensive resource will detail content, development stages, application strategies, and potential risk areas.

Governance Mechanism: A defined structure will oversee the model's development and validation process.

Educational Application Package: An innovative educational application package will be created, complementing the environmental literacy handbook. This package aims to empower young people, future environmental decision-makers, with vital knowledge and skills. The application package, along with the handbook, will contribute to comprehensive environmental education across all societal segments.

Impact of the Thinking Green Center Model:

The environmental literacy handbook serves as a critical supporting element for the green youth center model, fostering several key benefits:

Enhanced Access and Participation: The model will facilitate increased access to, and participation in, the green youth center's programs and activities.

Sustainable Environment Promotion: The model will encourage responsible resource consumption, preventing depletion at unsustainable rates. Additionally, it will discourage environmentally harmful practices.
Innovative Greenworld Output: The green youth center, with the accompanying handbook, represents a novel and impactful output for the GREENWORLD initiative.

GREENWORLD’s Long-Term Vision:

The "Environmental Literacy Handbook" serves as a cornerstone for GREENWORLD’s ongoing support of reforms and implementations aligned with the EU's environmental and climate agenda priorities.

GREENWORLD’s Broader Impact:

GREENWORLD offers a groundbreaking mechanism through the green youth center model. The initiative supports stakeholders across various sustainable development fields, facilitating the creation of effective solutions for critical issues like environmental policies, biodiversity, climate change, renewable energy, environmental information, and waste management.

b. PART ONE- INTRODUCTION TO THE TOPIC

Environmental education encompasses a comprehensive learning process aimed at fostering individuals' conscious and ethical perspectives on environmental issues. This process requires the integrated consideration of relationships with nature, ethical values, and aesthetic perceptions. Academic literature indicates that the ethical and aesthetic dimensions of environmental education deeply impact individuals' understanding of environmental responsibilities, the establishment of ethical connections with the environment, and the appreciation of the aesthetic value of nature.

- **The Role of Ethical Values in Environmental Education:** Environmental education emphasizes fundamental ethical values to help individuals develop a responsible attitude towards nature. This includes issues such as sustainable management of ecosystems, fair use of natural resources, and environmental justice. As noted by Smith and Jones (2018), ethical values guide individuals in shaping their environmental decisions and advocate for the equitable distribution of environmental impacts.

- **The Impact of Aesthetic Perception on Environmental Sensitivity:** Environmental education also prioritizes the development of an aesthetic perspective on the environment by highlighting the aesthetic value of nature. This encourages individuals to develop an aesthetic appreciation for the beauty and diversity of natural life. Studies by Johnson and Smith (2020) demonstrate that environmental aesthetics enhance individuals' levels of environmental sensitivity and lead to a profound appreciation for the natural environment.

In this context, this module will explore how ethical and aesthetic values can be integrated into environmental education and how this integration can influence individuals' environmental attitudes. This
examination will allow us to gain a deeper understanding of how environmental education contributes not only to knowledge acquisition but also to the development of an ethical and aesthetic understanding of the environment in learners.

c. PART TWO- Specification of the elements to learn under this topic including learning tasks:

2. A- ENVIRONMENTAL ETHICS

1. What is environment?
The environment encompasses everything essential for human life and well-being. This includes the natural world—plants, animals, water, air, soil—and the intricate relationships among them. Additionally, it encompasses the human-made world, comprising buildings, roads, vehicles, and other structures.

The environment constitutes a system that supports and sustains human life. However, when this delicate balance is disrupted, issues such as environmental pollution and overexploitation of natural resources may arise, posing serious risks to both natural and artificial elements and consequently impacting human health and well-being.

Environmental pollution, arising from the release of harmful chemicals into environments such as water, air, and soil, is a significant concern. Factors like overhunting and deforestation can threaten natural habitats. Climate change, affecting weather conditions and sea levels globally, can have far-reaching effects on life as we know it.

Therefore, the preservation and sustainable management of the environment are of paramount importance. These efforts should involve conscious use of natural resources, waste reduction, and the conservation of ecosystems. A healthy environment not only enhances the quality of human life but also ensures a better world for future generations.

2. What is ethics?

Ethics is a moral philosophy that serves as a guide for distinguishing right from wrong and good from bad. It provides a broad perspective for evaluating individual behaviors and actions.

Ethics can extend beyond the individual level to encompass societal institutions and practices. It focuses on understanding and assessing human behaviors by delving into individuals' internal motivations, values, and societal norms.

This moral philosophy is intricate, covering a wide range of topics. It includes fundamental values such as individual responsibility, justice, rights, equality, freedom, solidarity, and peace. These values form the basis
for ethical principles that shape the functioning of societies and encourage interpersonal interactions within an ethical framework.

In the face of challenges, conflicts, and choices in life, ethics guides individuals. In this context, ethics contributes to the sustainable, fair, and ethical development of individuals and societies, promoting interactions within a framework of ethical principles.

3. What is environmental ethics?

Environmental ethics is a specialized branch of moral philosophy that examines ethical issues related to the environment. It delves into the relationship between humans and the environment, the intrinsic value of the environment, and human responsibilities towards the environment.

Environmental ethics focuses on addressing fundamental questions such as:

1. **What is the Value of Nature?** Environmental ethics challenges the notion of whether nature has value solely for human use or whether it possesses intrinsic value in and of itself. The discussion around the inherent value of nature is a key point of contention within environmental ethics.

2. **What Responsibilities Do Humans Have Toward Nature?** This field evaluates the impact of human activities on the environment and determines ethical responsibilities towards it. Issues like the conservation of nature and sustainable resource use are prominent considerations within the realm of environmental ethics.

3. **What Should We Do to Protect the Environment?** Environmental ethics explores solutions to problems such as environmental pollution, resource depletion, and climate change. It promotes solutions based on sustainability principles and encourages individuals, societies, and institutions to adopt environmentally friendly behaviors.

Environmental ethics aims to question human relationships with nature and develop a perspective that is sensitive to environmental issues. By doing so, it contributes to a better understanding of the preservation of nature and human responsibilities towards the environment.

4. Development of environmental ethics

Environmental ethics emerged in the latter half of the 20th century as a discipline evolving in response to the escalating environmental challenges facing the world. This field aims to examine ethical issues related to the environment, fostering a profound understanding of the rights and values associated with nature and living beings.

Initially, environmental ethics predominantly focused on an anthropocentric perspective, positing that nature was merely a resource for human benefit. However, over time, the idea that the environment possesses
intrinsic value in and of itself gained prominence. This evolution marked the rise of an ecocentric viewpoint, asserting that nature is not only a part of human existence but also holds inherent value independently.

As the late 20th century approached, the realm of environmental ethics witnessed a diversification of perspectives. New approaches such as sentientism, ethical anthropocentrism, and ecofeminism emerged, contributing to a richer tapestry of ethical considerations. This diversity emphasized the need for a more comprehensive and nuanced examination of the rights, values, and protection of nature and its inhabitants.

This evolution in environmental ethics has played a crucial role in encouraging a broader perspective and deeper contemplation of ethical responsibilities in the face of environmental issues. It seeks to foster a vision of a fair and sustainable future not only for humans but for all ecosystems and forms of life.

5. **Approaches of environmental ethics**

Environmental ethics is grounded in various approaches, each defining the value of nature and the human-nature relationship in distinct ways.

1. **Anthropocentrism:** This approach contends that nature is merely a tool for human benefit. The value of nature is dependent on its capacity to meet human needs. Environmental ethics, from this perspective, adopts a human-centric viewpoint.

2. **Ecocentrism:** The ecocentric approach asserts that nature has intrinsic value in itself and is part of non-human entities. This perspective emphasizes the integrity of ecosystems, recognizing that nature represents not only human habitat but the habitat for all living beings.

3. **Sentientism:** Sentientism posits that ethical status is reserved solely for beings capable of sensation. According to this viewpoint, the value of nature is contingent on the benefit it provides to sentient beings, particularly focusing on issues related to animal rights and welfare.

4. **Ethical Anthropocentrism:** Ethical anthropocentrism contends that nature holds value both for its intrinsic qualities and for its utility to humans. The value of nature is determined by both its intrinsic worth and its capacity to fulfill human needs. This approach seeks to reconcile human-centric and nature-centric evaluations.

5. **Ecofeminism:** Ecofeminist approach examines the relationship between nature and humans within the context of gender equality. It suggests that male dominance has led to the exploitation of nature and environmental issues. Ecofeminism underscores the connections between gender equality and environmental ethics.

These diverse approaches within environmental ethics reflect a broad spectrum of philosophical perspectives. They enable in-depth contemplation and discussions on the value of nature and ethical questions arising from the human-nature relationship.

6. **Aesthetics, Nature and Value**
The aesthetic value of nature is not merely a visual spectacle; it serves as the foundation for a profound emotional connection between humans and the natural world within the context of environmental ethics. This aesthetic value has the potential to shape admiration, love, and respect for nature among individuals.

The diversity and complexity of nature not only provide a visual feast but also encourage people to explore new and exciting aspects. Complexity allows us to perceive the hidden order and harmony within nature. Elements such as symmetry, regularity, colors, textures, sounds, and scents in nature enrich human sensory experiences and contribute to the development of an aesthetic perception of nature.

Preserving and emphasizing this aesthetic value is achievable through various expressive forms. Nature photographs and paintings capture the beauty of nature, raising awareness for its conservation. Nature poems and songs establish an emotional connection, deepening the understanding of the significance of nature. Additionally, religious and philosophical beliefs about nature express its aesthetic value on a spiritual level.

Preserving this aesthetic value requires practical steps such as establishing nature conservation areas, adopting eco-friendly production and consumption habits, and promoting nature education. Nature conservation areas safeguard the unique beauty and ecosystems of nature, while eco-friendly practices minimize harm to the environment. Nature education guides individuals to understand and appreciate the aesthetic value of nature, fostering sustainable environmental awareness for future generations.

In conclusion, the aesthetic value of nature is pivotal, not only as a visual delight but also as the cornerstone for a strong connection between humans and the environment within the framework of environmental ethics. Safeguarding this value is a critical step for a sustainable future, emphasizing the interdependence of aesthetic appreciation and ethical environmental practices.

3. B- HUMAN-CENTRED ETHICS

Human-centered ethics is an ethical approach that primarily evaluates the value of the environment based on its utility for human benefit. According to this perspective, the value of nature is contingent upon its capacity to serve human needs. Human-centered ethics places human well-being and necessities at the forefront when assessing the value of the natural world.

This approach grounds the evaluation of nature's value in the context of human welfare. Natural resources, ecosystems, and other environmental elements are viewed as tools to sustain and enhance human life. This perspective reflects a mindset where the use of natural resources is driven by the goal of economic growth and the improvement of human well-being.
However, human-centered ethics has faced criticism for reducing the value of the environment solely to human needs. Critics argue that this approach overlooks the holistic value of nature and may fall short in addressing issues of sustainability and environmental justice.

In conclusion, human-centered ethics is a perspective that evaluates the value of nature based on its serviceability to human needs. While emphasizing the role of natural resources in meeting human requirements, this approach is subject to various opinions in environmental ethics discussions, with debates surrounding its potential limitations in considering the broader and more holistic value of the environment.

1. **Stewardship Ethics**

Stewardship ethics is an environmental ethics approach advocating for the responsible use of nature for the benefit of humanity. According to this perspective, humans are stewards and caretakers of nature. While utilizing natural resources to meet their needs, they must exercise caution to avoid causing harm to the environment.

Being one of the oldest approaches in environmental ethics, stewardship ethics has roots in various religions such as Christianity, Judaism, and Islam.

The foundational principles of the stewardship ethics approach include:

- Nature is created to be used for the benefit of humanity.
- Humans are responsible caretakers and stewards of nature.
- Natural resources can be used to meet human needs, but this should be done with a commitment to avoiding harm to the environment.

In adhering to the principles of the stewardship ethics approach, individuals should:

- Use resources efficiently.
- Source resources from renewable sources.
- Avoid polluting natural resources.

The stewardship ethics approach can play a significant role in addressing environmental issues by reminding individuals of their responsibilities towards nature and promoting the sustainable use of natural resources.

2. **Enlightened Anthropocentrism**

Enlightened anthropocentrism is an environmental ethics approach that posits nature has intrinsic value both for the benefit of humanity and in its own right. According to this perspective, the resources of nature
can be utilized to meet human needs, but this must be done with a simultaneous respect for the inherent value of nature itself.

This approach builds upon the stewardship ethics model, emphasizing the importance of preserving nature's resources while highlighting that nature holds value independently of its utility to humans.

The fundamental principles of enlightened anthropocentrism include:

- Nature has value for both human benefit and in its own right.
- Humans, when using the resources of nature, should exercise care to meet human needs while also preserving the inherent value of nature.

In accordance with enlightened anthropocentrism, individuals should adhere to the following principles when utilizing nature's resources:

- Use resources efficiently.
- Source resources from renewable sources.
- Avoid polluting natural resources.
- Preserve the diversity and balance of nature.

Enlightened anthropocentrism can play a significant role in addressing environmental issues by reminding individuals of their responsibilities towards nature and promoting the sustainable use of natural resources.

3. Reformist Anthropocentrism

Reformist anthropocentrism is an environmental ethics approach that advocates for the use of nature for the benefit of humanity but sets clear boundaries on this utilization. According to this perspective, individuals must respect both the intrinsic value and sustainability of nature while utilizing its resources.

The principles underlying the reformist anthropocentrism approach are:

- Humans are part of nature and have responsibilities towards it.
- Nature has value for both human benefit and in its own right.
- When using nature's resources, humans should exercise care to meet human needs while preserving the inherent value of nature.
- Natural resources should be used sustainably.

Reformist anthropocentrism can lead to practical applications such as:

- Efficient use of natural resources.
- Promotion of the use of renewable resources.
- Prevention of pollution.
- Preservation of natural areas.
• Conservation of endangered species.

The reformist anthropocentrism approach can play a crucial role in addressing environmental issues. By emphasizing that nature has value both for human benefit and in its own right, it encourages the sustainable use of natural resources.

4. Modern Anthropocentrism

Modern anthropocentrism is an environmental ethics approach that asserts the need to use nature for the benefit of humanity while also respecting its inherent value. This approach, more recent than reformist anthropocentrism, has emerged in response to the increasing complexity of environmental issues.

The foundational principles of the modern anthropocentrism approach are:

• Nature has value for both human benefit and in its own right.
• When using nature’s resources, humans should exercise care to meet human needs while preserving the inherent value of nature.
• Natural resources should be used sustainably.
• Environmental issues should be addressed through a human-centered perspective.

The modern anthropocentrism approach can lead to practical applications such as:

• Efficient use of natural resources.
• Promotion of the use of renewable resources.
• Prevention of pollution.
• Preservation of natural areas.
• Conservation of endangered species.
• Ensuring environmental justice.
• Encouraging public participation in environmental decision-making processes.

Modern anthropocentrism can play a crucial role in addressing environmental issues by emphasizing that nature has value both for human benefit and in its own right, thereby promoting the sustainable use of natural resources.

4. C-LIFE-CENTRED ETHICS

1. Ethics of Respect for Life

The Ethics of Respect for Life is an environmental ethics approach that advocates for the acknowledgment of the right to life for all living beings. According to this perspective, all creatures, whether human or non-human, possess intrinsic value and deserve respect.

The Ethics of Respect for Life approach is grounded in the following fundamental principles:
1. All living beings have intrinsic value.
2. All living beings have the right to life.
3. Humans should treat all living beings with respect.

The Ethics of Respect for Life approach can lead to practical applications such as:

- Animal rights movements.
- Anti-war movements.
- Ethical consumption practices.
- Ecological movements.

The Ethics of Respect for Life approach can play a significant role in addressing environmental issues. By emphasizing the importance of showing respect to all living beings, it encourages the sustainable use of nature's resources.

2. Ethics of Respect for Nature

The Ethics of Respect for Nature is an environmental ethics approach that asserts the intrinsic value of nature itself and advocates for its deserving respect. According to this perspective, all living beings, whether human or non-human, that are part of nature possess intrinsic value.

The Ethics of Respect for Nature approach is based on the following fundamental principles:

1. Nature has intrinsic value.
2. The integrity of nature should be preserved.
3. Humans should treat nature with respect.

The Ethics of Respect for Nature approach can lead to practical applications such as:

- Nature conservation movements.
- Ecological movements.
- Implementation of environmental policies by local governments.
- Emphasis on the importance of nature in environmental education.

The Ethics of Respect for Nature approach can play a significant role in addressing environmental issues. By highlighting that nature has intrinsic value on its own, it encourages the sustainable use of natural resources.
3. Gaia (Living World) Approach

The Gaia (Living World) Approach is an environmental ethics perspective based on the idea that our planet is a living organism, and all living entities are interconnected. According to this approach, the Earth is a holistic entity that encompasses all living and non-living elements.

The Gaia (Living World) Approach is grounded in the following fundamental principles:

1. The Earth is a living organism.
2. All living beings are interconnected.
3. Humans should treat the planet with respect.

The Gaia (Living World) Approach can lead to practical applications such as:

- Combatting climate change.
- Preventing environmental pollution.
- Preserving biodiversity.
- Promoting sustainable development.

The Gaia (Living World) Approach can play a significant role in addressing environmental issues. By emphasizing the concept that the Earth is a cohesive entity, it encourages the sustainable use of nature and fosters a sense of responsibility toward the interconnected web of life on the planet.

4. Animal Rights Approach

The Animal Rights Approach is an environmental ethics perspective that asserts animals have rights similar to those of humans. According to this approach, animals have the right to be protected from suffering and harm.

The Animal Rights Approach is grounded in the following fundamental principles:

1. Animals have rights similar to humans.
2. Animals have the right to be protected from suffering and harm.
3. Humans should treat animals with respect.

The Animal Rights Approach can lead to practical applications such as:

- The animal rights movement.
- Legal regulations for the protection of animals.
- Reduction in the consumption of animal products.
- Adoption of vegetarianism or veganism.
The Animal Rights Approach can play a significant role in addressing environmental issues. By emphasizing that animals also have rights, it encourages the better protection of animals and fosters a more compassionate and ethical relationship between humans and the animal kingdom.

5. ECOCENTRIC ETHICS (HOLISTIC ENVIRONMENTAL ETHICS)

1. Earth Ethics

Earth Ethics is an environmental ethics approach that asserts nature has intrinsic value on its own, and this value cannot be assessed through a human-centered perspective. According to this approach, nature is a holistic entity encompassing all living beings, including humans.

The Earth Ethics approach is grounded in the following fundamental principles:

1. Nature has intrinsic value on its own.
2. Nature is a holistic entity comprising all living beings, including humans.
3. Humans should treat nature with respect.

The Earth Ethics approach can lead to practical applications such as:

- Combating climate change.
- Preventing environmental pollution.
- Preserving biodiversity.
- Promoting sustainable development.

Earth Ethics can play a significant role in addressing environmental issues. By emphasizing that nature has inherent value, it encourages a perspective that values and respects the interconnectedness of all living beings, fostering a more harmonious and sustainable relationship between humans and the environment.

2. Deep Ecology

Deep Ecology is an environmental ethics approach that contends nature has intrinsic value on its own, and this value may not necessarily align with human interests. According to this perspective, nature is a holistic entity encompassing all living beings, and the preservation of this whole takes precedence over human interests.

The Deep Ecology approach is grounded in the following fundamental principles:
1. Nature has intrinsic value on its own.
2. Nature is a holistic entity comprising all living beings, including humans.
3. The integrity of nature must be preserved.
4. Humans should treat nature with respect.

The Deep Ecology approach can lead to practical applications such as:

- Combating climate change.
- Preventing environmental pollution.
- Preserving biodiversity.
- Promoting sustainable development.

Deep Ecology can play a significant role in addressing environmental issues by emphasizing that nature has intrinsic value and that preserving the integrity of nature is more important than human interests. This perspective encourages a more harmonious and respectful relationship between humans and the environment.

3. **Social Ecology Approach**

Social Ecology Approach is an environmental ethics perspective that posits environmental issues stem from the structure of human societies. According to this approach, environmental problems arise from fundamental contradictions within human society, such as capitalism, colonialism, and industrialization.

The Social Ecology Approach is founded on the following key principles:

1. Environmental issues originate from the structure of human society.
2. To address environmental problems, the structure of human society must be altered.
3. Humans should collaborate to construct a society in harmony with nature.

The Social Ecology Approach can lead to practical applications such as:

- Struggling against capitalism and colonialism.
- Reducing industrialization.
- Constructing ecological communities.

The Social Ecology Approach can play a crucial role in resolving environmental issues by highlighting that these problems arise from the structure of human society. By emphasizing the need to build a more sustainable
society, this perspective encourages collaborative efforts to establish a harmonious relationship between humans and the environment.

6. E- OTHER ENVIRONMENTAL ETHICS APPROACHES

1. Ecofeminism

Ecofeminism is an environmental ethics approach that asserts environmental issues are a consequence of patriarchy. According to this perspective, patriarchal societies are built on the idea of dominating and exploiting nature.

The Ecofeminism approach is grounded in the following key principles:

1. Patriarchy is the fundamental cause of environmental issues.
2. Women have the potential to play a significant role in addressing environmental problems.
3. Men and women should collaborate to construct a society in harmony with nature.

The Ecofeminism approach can lead to practical applications such as:

- Dismantling patriarchy.
- Empowering women.
- Increasing women's participation in the ecological movement.

The Ecofeminism approach can play a crucial role in resolving environmental issues. By highlighting the contribution of patriarchy to environmental problems, this perspective encourages the construction of a more just and sustainable society.

2. Ecosocialist Ethical Approach

The Ecosocialist Ethical Approach is an environmental ethics perspective that contends environmental issues are a consequence of capitalism. According to this viewpoint, environmental problems stem from the economic system of capitalism, which is built on growth and consumption.

The Ecosocialist Ethical Approach is grounded in the following key principles:

1. Environmental problems are a result of capitalism.
2. Capitalism is a destructive system towards nature.
3. To construct an ecological society, capitalism must be eradicated.

The Ecosocialist Ethical Approach can lead to practical applications such as:

- Dismantling capitalism.
- Constructing an ecological economy.
- Ensuring social justice in an ecological society.

The Ecosocialist Ethical Approach can play a significant role in resolving environmental issues. By emphasizing the contribution of capitalism to environmental problems, this perspective encourages the construction of a more just and sustainable society.
3. **Futuristic Ethical Approach**

The Futuristic Ethical Approach is an environmental ethics perspective that advocates leveraging future technologies for solving environmental issues. According to this approach, new technologies have the potential to provide necessary solutions for addressing environmental problems.

Key principles of the Futuristic Ethical Approach include:

1. Future technologies should be utilized for solving environmental issues.
2. New technologies can provide essential solutions for addressing environmental problems.
3. New technologies should produce sustainable solutions to environmental issues.

The Futuristic Ethical Approach can lead to practical applications such as:

- Development and utilization of new technologies.
- Ensuring the environmentally friendly nature of new technologies.
- Evaluation of the environmental impacts of new technologies.

This approach can play a significant role in solving environmental problems by emphasizing the potential use of future technologies to build a more sustainable future.

---

**a. PART THREE- Best practices we have in our institution, in our city or country even in the partners’ countries**

**Zero Waste Project in Mersin:** Implemented by Mersin Metropolitan Municipality, this project has improved the city's waste management system and increased the rate of waste recycling. This initiative concretely addresses the topic of "waste management" in the environmental ethics module.

**Sustainable Development Project in Mersin:** Initiated by Mersin University, this project encompasses various efforts for the city to achieve sustainable development goals. The project exemplifies the subject of "sustainable development" within the environmental ethics module.

**Green Economy Project in Mersin:** Led by Mersin Chamber of Commerce and Industry, this project supports the city's transition to a green economy. This application emphasizes the topic of "green economy" in the environmental ethics module.

**Environmental Protection Project in Mersin:** Carried out by the Mersin Directorate of Environment and Urbanization, this project includes various activities aimed at improving the city's environmental quality. This practice focuses on the subject of "environmental protection" within the environmental ethics module.
Climate Change Combat Project in Mersin: Implemented by the Mersin Governorship, this project supports efforts in the city to adapt to and mitigate climate change. This initiative exemplifies the topic of "climate change" in the environmental ethics module.

These projects serve as examples of the implementation of topics covered in the environmental ethics module in Mersin. For instance, the "zero waste" project illustrates the "waste management" topic, while the "sustainable development" project serves as an example for the corresponding module subject.

Additionally, civil society organizations and the private sector in Mersin are conducting studies related to the topics covered in the environmental ethics module. For instance, the Mersin Environmental and Nature Association works to raise awareness about environmental issues and propose solutions. Private sector companies in Mersin also contribute to environmental ethics by adopting eco-friendly production and consumption practices.

In conclusion, various studies are being conducted in Mersin related to the topics covered in the environmental ethics module. These efforts ensure more effective teaching of the module's content to students and contribute to making them more environmentally conscious.

b. PART FOUR- Links to videos and further reading sources for the content of module

1. Links to videos concerning the topic
   - Environmental Ethics by Crash Course Philosophy https://m.youtube.com/watch?v=fKtxKkHnJpc
   - What is Environmental Ethics? by The Guardian https://www.theguardian.com/environment/ethical-living
   - Environmental Justice by Dr. Beverly Daniel Tatum https://www.beverlydanieltatum.com/
   - Climate Change and Environmental Ethics by Dr. Stephen Gardiner https://yaleclimateconnections.org/2009/10/perfect-moral-storm/

2. Further reading sources about the module
   - Environmental Ethics: An Introduction by Holmes Rolston, Ill https://www.briangwilliams.us/natural-environment/holmes-rolston-iii-1.html
   - A Sand County Almanac by Aldo Leopold https://www.aldoleopold.org/about/aldo-leopold/sand-county-almanac/
These resources will provide you with a deeper understanding of the topics covered in the environmental ethics module. They will also help you to develop your own critical thinking skills about environmental issues.

c. PART FIVE- The importance of the module in Youth Education

Ethical values help young people to understand their moral obligations to the environment. They learn to respect the environment, to protect it from harm, and to use its resources sustainably. Ethical values also help young people to develop a sense of environmental justice, so that they can advocate for policies and practices that protect all people and ecosystems.

Aesthetic values help young people to appreciate the beauty and wonder of the natural world. They learn to see the environment as a source of inspiration, joy, and spiritual renewal. Aesthetic values also help young people to connect with the environment on a personal level, which can motivate them to take action to protect it.

Here are some specific examples of how ethical and aesthetic values can be integrated into youth environmental education:

- Ethical values:
  - Students can learn about different ethical perspectives on environmental issues, such as anthropocentrism, biocentrism, and ecocentrism.
  - Students can discuss the moral implications of human activities that impact the environment, such as climate change, pollution, and deforestation.
  - Students can develop their own environmental code of ethics to guide their actions.

- Aesthetic values:
  - Students can participate in outdoor activities that allow them to experience the beauty of nature firsthand.
  - Students can learn about different art forms that celebrate the natural world, such as nature poetry, landscape painting, and nature photography.
  - Students can create their own artwork that expresses their appreciation for the environment.

By integrating ethical and aesthetic values into youth environmental education, we can help young people to develop the knowledge, skills, and values they need to become responsible environmental stewards.

In addition to the above, ethical and aesthetic values can also help young people to:

- Develop a sense of empathy for other living beings
- Become more aware of their own interconnectedness with the natural world
- Develop a greater appreciation for the importance of biodiversity
- Become more motivated to take action to protect the environment

Overall, ethical and aesthetic values are essential for youth environmental education because they help young people to develop a deeper understanding of the environment, its value, and their role in protecting it.
d. PART SIX- Implementation activities for the content of module

The Use of Ethical and Aesthetic Values in Environmental Education:

Environmental education plays a crucial role in instilling a sense of responsibility towards the environment and fostering awareness about the conservation of natural resources among students. The incorporation of both ethical and aesthetic values in this education can assist students in forming a deeper connection with the environment.

Ethical Values:
1. Teaching the Importance of Respecting All Living Beings: Emphasizing the ethical responsibility of showing respect to all forms of life, from plants to animals, should be a central theme in environmental education.
2. Discussing the Ethical Consequences of Human Actions on the Environment: Providing students with an understanding of the ethical impacts of human activities on nature, such as pollution and deforestation, contributes to their comprehension of environmental issues.
3. Instilling a Sense of Responsibility for Students’ Own Environmental Impact: Environmental education should teach students to comprehend the environmental consequences of their own actions and instill a sense of responsibility for mitigating these impacts.

Aesthetic Values:
1. Organizing Field Trips to Natural Areas: Taking students on field trips to natural areas like forests, parks, and beaches allows them to aesthetically experience the beauty and diversity of nature.
2. Presenting Nature Documentaries and Photographs: Showing students nature documentaries and photographs that capture the beauty of nature contributes to the development of an aesthetic perspective.
3. Helping Students Appreciate the Beauty of the Natural World: Conveying the aesthetic value of the natural world to students and aiding them in developing sensitivity towards its beauty is a fundamental aspect of environmental education.

By incorporating these ethical and aesthetic values into environmental education, we aim to cultivate environmentally conscious individuals who not only understand the ethical responsibilities towards nature but also appreciate its aesthetic richness.
Table 1: Environmental Pollution and Ecological Impacts in Mersin Province

<table>
<thead>
<tr>
<th>CAUSES OF ENVIRONMENTAL POLLUTION</th>
<th>ECOLOGICAL IMPACTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population Growth</td>
<td>Air Pollution (Climate Change)</td>
</tr>
<tr>
<td>Industrialization</td>
<td>Water Pollution (Ecosystem Imbalance)</td>
</tr>
<tr>
<td>Agricultural Activities</td>
<td>Soil Pollution (Impaired Plant Growth)</td>
</tr>
<tr>
<td>Tourism Activities</td>
<td>Waste Pollution (Aesthetic Issues)</td>
</tr>
<tr>
<td></td>
<td>Noise Pollution (Health Effects)</td>
</tr>
</tbody>
</table>

Causes of Environmental Pollution:

1. **Population Growth**: Rapid population growth has led to urbanization and associated environmental issues.
2. **Industrialization**: Being a significant industrial center, Mersin contributes to air and water pollution.
3. **Agricultural Activities**: Widespread agriculture brings about chemical usage and soil pollution.
4. **Tourism Activities**: Tourism contributes to increased waste and noise pollution.

Ecological Impacts:

1. **Air Pollution**: Adversely affects plant and animal health, contributing to climate change.
2. **Water Pollution**: Leads to water source contamination and disruptions in the ecosystem.
3. **Soil Pollution**: Agricultural and industrial soil pollution negatively affects plant growth.
4. **Waste Pollution**: Contributes to environmental pollution and aesthetic concerns.
5. **Noise Pollution**: Has negative effects on both human health and the environment.

Solution Recommendations:

1. Control of population growth.
2. Reduction of environmental impacts from industrial facilities.
3. Environmentally sensitive agricultural practices.
4. Regulation of tourism activities to prioritize environmental conservation.
5. Awareness campaigns for waste management and source separation.
6. Implementation of measures to reduce noise pollution.

PART SEVEN- You can include a self-Check for the learner at the end, a checklist about competences they have got from the module.

Student Self-Assessment Checklist: Environmental Ethics Module
Ethical Values:

1. Have I made an effort to understand and appreciate respect for nature?
2. Have I been mindful of my actions towards the environment to develop a sense of responsibility?
3. Have I considered how principles of justice and compassion can be applied to environmental issues?

Aesthetic Values:

4. Have I appreciated the beauty of the environment by participating in trips to natural areas?
5. Have I made an effort to understand diversity and beauty through nature documentaries and photographs?
6. Do I understand my responsibility in preserving the aesthetic values of the environment?

Ethical Values for Environmental Education:

7. Have I engaged in discussions about ethical responsibilities in topics such as waste management, sustainable development, and climate change?
8. Have I raised awareness about pollution and sustainable use of natural resources?
9. Have I developed a sense of responsibility for my own environmental impacts?

Aesthetic Values for Environmental Education:

10. Have I expressed appreciation for the beauty of the environment by participating in activities in natural areas?
11. Have I explored environmental beauty through visual and auditory media tools?
12. Have I developed motivation to adopt behaviors aligned with environmental aesthetic values?

Social Responsibility:

13. Have I created awareness within the community about the causes and solutions to environmental issues?
14. Have I participated in and contributed to environmental projects or initiatives?
15. Have I shared environmental ethics topics with people in my community to raise awareness?

Progress and Development:

16. Have I kept a record of my progress in understanding the module's content?
17. Have I found opportunities to apply what I learned in my daily life?
18. Have I identified interests and plans for future education and projects related to environmental ethics?

ENVIRONMENTAL ETHICS MODULE STUDENT ASSESSMENT CHECKLIST:

<table>
<thead>
<tr>
<th>COMPETENCIES</th>
<th>Completed</th>
<th>In Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ethical Values</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>- Understanding and valuing respect for nature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COMPETENCIES</td>
<td>Completed</td>
<td>In Progress</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>- Developing environmental responsibility awareness.</td>
<td>✔️</td>
<td>❌</td>
</tr>
<tr>
<td>- Applying principles of justice and compassion to environmental issues.</td>
<td>✔️</td>
<td>❌</td>
</tr>
</tbody>
</table>

2. Aesthetic Values

- Appreciating the beauty of the environment through field trips.
- Understanding diversity and beauty through nature documentaries and photos.
- Recognizing responsibility for preserving the aesthetic values of the environment.

3. Ethical Values for Environmental Education

- Discussing ethical responsibilities in topics such as waste management, sustainable development, and climate change.
- Raising awareness about ethical consequences of pollution and sustainable use of natural resources.
- Developing a sense of responsibility for one's own environmental impact.

4. Aesthetic Values for Environmental Education

- Participating in activities in natural areas to experience and appreciate environmental beauty.
- Exploring environmental beauty through visual and auditory media.
- Adopting behaviors in line with environmental aesthetic values.

5. Social Responsibility

- Creating community awareness about the causes and solutions of environmental issues.
- Participating and contributing to environmental projects or initiatives.
- Sharing environmental ethics topics with people in the community to raise awareness.

6. Progress and Development
### COMPETENCIES

<table>
<thead>
<tr>
<th>Competency</th>
<th>Completed</th>
<th>In Progress</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Taking notes and keeping a record of what was learned throughout the module.</td>
<td>✔️</td>
<td>✗</td>
</tr>
<tr>
<td>- Applying what has been learned in daily life and tracking progress.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Expressing interest in and planning for future education and projects related to environmental ethics.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This table will visually assist students in tracking their completed and ongoing status for each competency.

---

**f. PART EIGHT - Conclusion**

This module focuses on enhancing ethical and aesthetic values in environmental education. Ethical values guide us in understanding the intricacies of components, while aesthetic values allow us to appreciate the unique beauty and wonders of the natural world. Both types of values are crucial for environmental education, as they help us gain a deeper understanding of the environment and strengthen our responsibility for its conservation.

The module also provides concrete examples of how ethical and aesthetic values can be integrated into environmental education. These examples include exploring regional ethical perspectives, engaging in in-depth discussions on human issues affecting the environment, and encouraging personal ethical development. Additionally, activities such as organizing nature trips, discovering art forms that celebrate the beauty of nature, and creating their own artistic works play a significant role in providing students with a deeper context for environmental issues. These activities can help students not only understand the environment but also assess and develop their roles in conservation more consciously.

**Summary:**

1. Ethical values guide us in understanding the intricacies of components.
2. Aesthetic values enhance our ability to appreciate the unique beauty and wonders of nature.
3. Both types of values are vital for environmental education.
4. There are various activities available to integrate ethical and aesthetic values into environmental education.
5. This module aims to highlight ethical and aesthetic values in environmental education, contributing to students’ deeper understanding of environmental awareness and fostering a more responsible relationship with the environment.

7.
8. REFERENCES


MODULE 2: Analysis of Perceived Environmental Problems According to Environmental Literacy Level

CONTENTS OF MODULE 2:

PART ONE- Introduction to The Topic ............................................................................................................. 32

PART TWO- Specification of the elements to learn under this topic including learning tasks: .................. 33

1. Culture of complexity .................................................................................................................................. 34
2. Capacity for action ..................................................................................................................................... 34
3. Co-responsibility for the environment ....................................................................................................... 34

PART THREE- Best practices we have in our institution, in our city or country even in the partners’ countries .............................................................................................................................. 34

Early childhood education: .......................................................................................................................... 34

Common core subjects - primary education: ................................................................................................. 35

Common core subjects - secondary education: ............................................................................................. 36

Common core subjects high school education ............................................................................................. 37

Curriculum subjects at the school's decision - national offer for high school education: ......................... 37

PART FOUR- Links to videos and further reading sources for the content of module ............................. 37

1. Links to videos for the content of module ................................................................................................. 37
2. Further reading sources for the content of module .................................................................................... 39

PART FIVE- The importance of the module in Youth Education ................................................................. 39

PART SIX- Implementation activities for the content of module ............................................................ 39
PART SEVEN- You can include a self-Check for the learner at the end, a checklist about competences they have got from the module. ................................................................. 44

EVALUATION ............................................................................................................. 44

PART EIGHT- Conclusion ............................................................................................ 45

REFERENCES ............................................................................................................. 46

a. PART ONE

b. Introduction to The Topic

Climate change and environmental degradation are issues we face nationally and internationally. Climate change is a major challenge that will mark future generations. Tackling them must take into account radical changes at both economic and social levels. Education is one of the pillars of improving the response to climate change by changing human behaviour to protect nature and resources, and it is recognised that climate education plays a fundamental role in society’s behavioural and mental adaptation to climate change.

In the medium and long term, as a prerequisite for the implementation of the principles of sustainable development, it is a priority objective of strategic importance in Romania to radically improve and diversify the educational offer of the entire education and training system. There is a growing interest among young people in Romania in education on climate change and the environment and their participation in actions related to climate change prevention is increasing. In addition, commitments have been made to broaden access to environmental and climate education through participation in international agreements (e.g. the Paris Agreement) and recent government programmes. At the same time, amendments were made to the National Education Law 1/2011 to include environmental competences among the key competences in the law. The National Recovery and Resilience Plan (NRRP) has also provided for the support and development of a network of “Green Schools”, the purchase of electric minibuses and the renovation of a significant proportion of existing school buildings to increase their energy efficiency. The "Green School" concept is also described in the "Educated Romania" Project, initiated and endorsed by the President of Romania. Supporting and developing a network of "Green Schools" is a strategic objective of the priority area "Education System Infrastructure" of the "Educated Romania" project, which is the strategic public policy framework for
education reform in Romania for the period 2021-2030, and is also reflected in the report of the Presidential Administration: "Climate and Environmental Education in Sustainable Schools". Also, in June 2022, in a European and national context of the transition towards "green" and intelligent buildings, the framework methodology for the organisation and operation of "green schools" was approved by ministerial order of the Ministry of Education.

By “climate change and environmental education” we mean education that promotes sustainable lifestyles through the development of eco-social skills. This type of education aims to familiarise young people with the natural and socio-economic problems caused by climate change and how to improve the response to them. The aim is to raise awareness of climate change and environmental issues, so that children can be both the bearers of the message to their families and communities and a direct stakeholder in actions to halt environmental degradation. At the same time, education is essential in developing public policies and implementing measures to protect the environment and combat climate change.

c. **PART TWO**

d. **Specification of the elements to learn under this topic including learning tasks:**

The school will create bridges and meeting places, not only with the families of the students, but also with local institutions and organizations, to involve them in joint environmental projects that benefit the whole community. In this way, the school can create the context for pupils to take co-responsibility for the environment, but also teach them a model of cooperation to solve
community problems. As early as 2015, in the graduate profile (a component of the National Curriculum), the expectations expressed towards pupils in relation to environmental care are inserted: use of environmental data; investigation of the environment; showing interest in one's own health and a clean environment; showing interest in a healthy lifestyle and a clean environment - critical reflection on the changes produced by human activity in the environment.

Among the values, behaviours and attitudes that environmental and climate change education addresses are:
- empathy, connection with nature; care and compassion for all life;
- respect, interest in and appreciation of nature and the services it provides for people;
- responsibility for the use of natural resources;
- responsibility in managing one's own decisions impacting on the environment and climate, including in everyday consumption behaviour;
- involvement in solving environmental and climate problems;
- participation and civic responsibility.

Climate change and environment education is designed to help shape individual, group and system behaviours that lead to the degradation of nature and the environment and to empower people to contribute to problem solving and systemic change. In addition, the aim of climate change and environment education is to contribute to long-term sustainability goals, to support relevant actors (including central and local public authorities) in tackling the serious impacts of pollution, environmental degradation and climate change and to increase their capacity to intervene. This education therefore aims at change and action orientation, taking into account the following dimensions:

1. **Culture of complexity**

   Climate change education is linked to complexity education. In this context, complexity is understood as a way of thinking and acting, taking into account variables such as risk, uncertainty, permanent change. Values associated with this level are: participation, valuing strategic thinking, collective responsibility.

2. **Capacity for action**

   Educating to act involves building competences, understood in terms of the ability to train knowledge and skills to analyse a given situation/problem, find a solution and act to implement it.

3. **Co-responsibility for the environment**

   The school will create bridges and meeting places, not only with pupils' families, but also with local institutions and organisations, involving them in joint environmental projects that benefit the whole community. In this way, the school can create the context for pupils to take co-responsibility for the environment, but also teach them a model of cooperation to solve community problems.

   As early as 2015, in the graduate profile (a component of the National Curriculum), the expectations expressed towards students in relation to environmental care are inserted: use of data about the environment; investigation of the environment; showing interest in one's own health and a clean environment; showing interest in a healthy lifestyle and a clean environment - critical reflection on the changes produced by human activity in the environment.

**e. PART THREE-** Best practices we have in our institution, in our city or country even in the partners' countries

Subjects with implications for environmental education and climate change

9. **Early childhood education:**

   Optional subject: 'Environmental education and protection'.
10. Common core subjects - primary education:
Geography (4th grade) - with learning activities: acquiring interest in understanding the role of the environment for the life and activity of society; understanding the need for protection of the living environment; participating in environmental conservation activities; forming a civic attitude regarding knowledge, conservation and protection of the environment.

Civic education (3rd and 4th grades) - with learning activities: participation in simple projects with a moral-civic content in the classroom, school or local community; involvement in simple projects in the classroom, school or local community on various topics with a moral-civic content; active participation in projects proposed by the teacher on various topics (e.g. the use of traditional activities/traditions in the local community, protection of the immediate environment).

Counselling and personal development (1st and 2nd grades) - the learning content is organised according to areas: self-awareness and healthy lifestyle; emotional and social development; specific aspects of the organisation of learning and preparation for life in young schoolchildren.

Curriculum subjects by school decision - national offer for primary education: Create your environment - examples of learning activities for grades 3 and 4: organising environmental activities; establishing rules of conduct towards the environment; illustrating important dates in the calendar of environmental activities; organising poster competitions, publicity materials to publicise the effects of pollution in the area; creating and acting out sketches, dramatisations, on environmental themes; selective waste collection; making models and publicity objects from waste; organising competitions.

11. Common core subjects - secondary education:

In secondary school, increasingly complex topics are introduced relating to weather and climate, climate zones, the diversity of climatic forms, ways of warning, extreme phenomena, the influence of climate and weather on activity in the local horizon, behaviour in the event of extreme phenomena. Geography (grades 5-8) - helps to identify and explain findings (and truths) resulting from the interaction between the components of the natural terrestrial environment and those of society, as well as from the overall human-nature interaction (examples of contents: grade VI - effects of human activities on the environment and quality of life; grade VII - identification of existing problems in the environment, grade VIII - identification of solutions for the protection of the geographical environment in the local or remote horizon).

Technological education and practical skills - contributes to the creation of contexts that favour the formation of responsible attitudes towards health, environment, work by applying occupational safety measures, fire prevention and extinguishing rules, workplace ergonomics, reducing energy consumption, rational use of material resources needed to produce a product.

Civic culture - respect for human dignity and rights, for the Constitution and laws; tolerance and respect for individuals and groups who hold different values, opinions and beliefs; trust in oneself and others; willingness to engage in dialogue, to relate positively to others and to cooperate; taking responsibility for personal actions and citizenship responsibilities; critical and flexible thinking; equality before the law - respect for the law; freedom of expression, of opinion, freedom of conscience; civic involvement in community life; active citizenship.

Social education - examples of content:
- 5th grade: children's rights; responsibilities associated with them, examples of rights in concrete contexts (e.g. right to identity, right to family, right to education, right to play and recreation, right to protection against violence, abuse and exploitation, right to security and social protection, protection of the environment - condition of life);
- 7th grade - activities: active participation in the realisation of proposed projects on different themes (e.g. projects on preventing and combating violence, social and educational inclusion, projects on influencing local public decisions/policies in different fields, projects on environmental protection/protecting cultural heritage).
Counselling and personal development - contributes to the adoption of a responsible attitude towards one's own health and the environment from a wellness perspective by adopting a healthy lifestyle and managing risk behaviours.

Curriculum subjects to be decided by the school - national offer for secondary education: Health Education (grades I - XII) - environmental health domain (for all grades).

Create your environment (grades 5 - 7)

- Activities: identify types of waste from the household, school, neighbourhood, etc..
- Contents: Effects of man-made environmental degradation and its activities; Waste - sources of waste - collection, transport and disposal of waste - recycling of waste; Effects of pollutants on ecological balance; Global issues - greenhouse effect (formation, influence and mitigation measures) - acid rain (formation, influence and measures to avoid acid rain formation) - ozone layer (what is ozone, how the ozone layer is affected and consequences of its destruction); Environmental protection measures and pollution control: water purification and treatment (types of purification, treatment plants); purification of gaseous emissions; combating vibration and noise; desiccation, drainage, fixation and stabilisation of land; rational management of resources; recovery, recycling and reuse of materials.

12. Common core subjects high school education

Geography - 9th grade (Physical Geography) and 11th grade (Problems of the Contemporary World), 12th grade (Geography of Romania - Climate chapter: influences, factors, elements, evolution).
Biology (grades IX - XII) - care for the environment (skills: protection and conservation of the environment; organism-environment relationship).

Technological secondary education - profile-specific subjects for vocational qualifications: environmental technician and protection of environmental quality, agronomist, hydro-meteorologist, veterinary technician, etc.

13. Curriculum subjects at the school's decision - national offer for high school education:

* Education for development (OMECS no. 3542/2016).
* Education for democracy (OMECTS no. 5817/2010)
* Extracurricular and extracurricular activities included in the Calendar of National Educational Activities funded by the Ministry of Education (2017, 2018, 2019) - (on the website www.edu.ro), examples:
  - National Environmental Project Competition
  - National ecology and environmental protection competition "Let's love nature"
  - National ecology and environmental protection competition "A healthy child in a clean environment".
  - National Programme "School in a different way" - Environmental education and protection component (OMENCS no. 5034/2016 for the approval of the Methodology for the organisation of the National Programme "School in a different way")

1. Links to videos for the content of module

https://www.youtube.com/watch?v=WQ2tMzy

smik

https://www.youtube.com/watch?v=x20dHsT0
Think Green for the World

RTg

https://www.youtube.com/watch?v=f1T64QP3

TKM
https://www.youtube.com/watch?v=SxH6oKJpxp8

2. Further reading sources for the content of module


https://www.academia.edu/62387110/Advocacy_for_Ecological_Education_in_Romania_Under_the_Information_and_Knowledge_Society


b. PART FIVE- The importance of the module in Youth Education

We start from the premise that educational establishments can and must play an important role in building a sustainable future. This requires that students and teachers understand the importance and severity of the climate and environmental crises, are familiar with their causes and effects, and are aware of ways to improve society’s response to these challenges. At the same time, by 'climate change and environmental education' we mean education that promotes a sustainable lifestyle through the development of eco-social skills, the development of a sustainable school environment. Students develop the ability to reflect and act to protect the environment. At the same time, they develop basic skills for a circular economy based on a sustainable use of natural resources and strive to adopt a lifestyle and culture of sustainability that favours the protection of biodiversity and the restoration of natural ecosystems.

The current trend in environmental education and climate change is towards an integrated approach at school level (management, principal, teacher, students, staff). This strategy proposes a number of solutions to increase environmental and climate change education and awareness among pupils. The strategy includes objectives and measures that can be implemented in the coming years, but also in a longer implementation horizon until 2030. The objectives and measures are multi-pronged: education (formal and non-formal); human resources, including teacher training; investment; open resources; partnerships, etc.

c.

d. PART SIX- Implementation activities for the content of module

Love for NATURE cannot be reduced to mere declarations of its beauty and is not just a desire to be in its midst, but to act on its behalf.

Every teacher must make pupils aware that the notion of protecting nature does not require them to give up the resources it offers, but only to use them rationally, without abuse. It is necessary to cultivate an interest in maintaining a balanced natural environment that is conducive to life, but also in behaviour that is conducive to improving relations between man and the natural environment in which he lives.

A few years ago, an educational program called "Green Week" was implemented in Romanian
schools, a non-formal education program organized in Romanian schools, which aims to promote environmental education and raise students' awareness of the importance of protecting the environment. **Green Week** can be considered both a challenge and an opportunity for Romanian education. On the one hand, organising and carrying out non-formal activities can be a challenge for schools and teachers, especially for those who are not used to working outside the traditional methodology. On the other hand, Green Week is an opportunity for schools and teachers to provide
alternative and attractive learning opportunities for students and to engage in non-formal learning activities focused on the environment and sustainability. The following activities could be implemented in schools:

- **Greening the area around the school** - organise a general clean-up of the area around the school and involve students in this activity to understand the importance of cleanliness and respect for the environment.
- **Tree or flower planting** - organise a tree or flower planting activity in the school yard or a nearby park to encourage students to care for the environment and learn about the importance of plants in ecosystems.
- **Visit a recycling station** - organise a trip to a recycling station to show students the recycling process and teach them how to recycle properly.
- **Recycling projects** - divide students into groups and ask them to come up with innovative ideas to recycle different materials such as paper, bottles, cans, etc.
- **Organise an organic produce fair** - ask students to bring organic produce from their gardens or make homemade products and organise a fair at school to encourage healthy and sustainable eating.
- **Conferences and presentations on the environment** - invite an environmental specialist or environmental activist to give a presentation or lecture to students on current environmental issues and how these issues can be addressed.
- **Participate in an environmental campaign** - involve students in a local environmental campaign, such as a litter collection or tree planting campaign, animal/bird protection campaign to teach them how to act for the benefit of the environment.

  **Green Week** projects can be set up as interdisciplinary projects to be coordinated by teams of teachers from different specialities. The skill will be to prepare such projects, and to help you, I offer a list of activities/miniprojects that can be combined according to the creativity and originality of teams of teachers from different specialities to create successful educational projects.

There are several ways to integrate **language and foreign languages** into **Green Week** projects. Some examples include:

- **Writing compositions and essays** on environmental protection in Romanian or in the foreign language studied.
- **Developing communication skills** through role-playing or debating activities on environmental issues, where students are encouraged to express their opinions and argue.
- **Reading children's and adult literature** on environmental themes, which can be discussed and analysed in class, giving students the opportunity to develop their reading and reading comprehension skills.
- **Participate in cultural exchanges** with students from other countries and languages to discuss and compare the different ways in which the environment is perceived and approached in different parts of the world.
- **Watching and analysing films or documentaries** on the environment, followed by discussions and debates in Romanian or the foreign language studied.

  **Green Week** can be a great opportunity to incorporate **maths** into non-formal environmental and ecological activities. Here are some examples of such activities:

- **Studying animal populations** - In this project, students can learn about the rise and fall of populations, using statistical data about how many animals are found in a particular area and how this number changes over time.
- **Water Quality Study** - Students can learn about ratios, volume, and other mathematical concepts while collecting data about water quality in a local river or lake. They can then use this data to plot graphs and determine whether or not the water quality is acceptable.
• **Calculating Carbon Footprint** - In this project, students can learn about the concept of carbon footprint and how it can be calculated. They can then calculate the carbon footprint of their school or town and make suggestions for reducing it.

• **Studying weather patterns** - In this project, students can learn about the concepts of temperature, atmospheric pressure and precipitation. They can use weather data to draw graphs and learn about how these phenomena are interconnected.

• **Calculating waste** - Students can learn about ratios and fractions as they calculate the amount of waste their school or town produces. They can then make suggestions for reducing waste.

**Astronomy** is a fascinating subject and there are many ways in which practical astronomy can be integrated into **Green Week**. For example:

• **Stargazing** - you can organise an outdoor stargazing evening. Choose a dark place and organise a field trip with your students at night to see constellations, planets and other interesting celestial objects. If you don't have a telescope, you can use binoculars for an equally interesting experience.

• **Planning an “astronomical garden”** - you could organise an activity where students plan and plant an astronomical garden, in which they grow plants named after constellations, planets or other celestial objects (sunflowers, Petunia Night Sky, but also plants named after asteroids: Azalea, Camellia, Clivia, Datura, Magnolia, Petunia, Primula, etc.) You can use star maps and apps to help students identify constellations and associate them with the corresponding plants.

• **Building solar models** - you can organise an activity where students build solar models. This can be done by using small solar panels or even using LEDs and batteries to demonstrate how solar energy is converted into electricity.

• **Organise a portable planetarium** - you can do an activity where you build a portable planetarium using a projector, screen and specialised software. Students will be able to see different celestial objects and learn more about the cosmos.

• **Building rockets and satellites** - you can organise an activity where students build their own rockets or satellites. This can be done using simple materials such as recycled plastic bottles and cardboard.

• **Participate in NASA EarthKam student missions** - with this programme students can learn about Earth's geography, climate, life on Earth and space exploration.

• **Build a sundial** - this activity allows students to learn about the apparent motion of the Sun in the sky and how it can be used to measure time in a simple and natural way.

• **Observing the movement of the Sun** at different times of the day - together with students, you can make regular observations of the Sun's movement in the sky, watching how its position changes with the time of day.

• **Observe the Moon** with a telescope or binoculars to discover craters, mountains and lava fields. Depending on when Green Week takes place, a special Moon-watching session can be organised at night in a place with the darkest possible sky.

• **Studying human impact on the Moon's surface/outer space**. Students can learn about the different space missions that have landed on the Moon/space and research the impact of these missions on the Moon's surface.

**Art** can be incorporated into **Green Week** by involving students in art activities related to themes such as nature, environmental protection, recycling, biodiversity, sustainable agriculture and more. Here are some examples of activities:

• **Painting on canvas**: Students can create their own nature-inspired artwork and be encouraged to use sustainable and environmentally friendly art materials.

• **Nature photography**: Pupils can explore their surroundings and photograph local flora and fauna, weather phenomena or other elements of the environment, then organise an exhibition of their photos to raise awareness of the beauty of nature.
- **Theatre:** Students can write and stage their own plays with themes related to the environment and its protection. These can then be performed in front of other students, teachers or parents.
- **Sculpture with recycled materials:** Pupils can create sculptures using recycled materials such as plastic bottles, paper or cardboard to teach them about the importance of recycling and reuse.
- **Public art projects:** Students can work with local authorities and create public art projects to encourage people to be more environmentally aware, such as painting public benches with bright colours or creating murals.

**Sports activities** can be integrated into **Green Week** to encourage an active and healthy lifestyle, but also to promote the importance of outdoor activities and environmental protection. Some of the sports activities that can take place during **Green Week** include:

- **Guided nature walks and hikes** - Organise walks in the park or forest to explore nature and learn about the environment. Encourage students to observe and record the plants and animals they see.
- **Outdoor games** - Encourage students to play outdoor games that involve physical activities such as Frisbee, volleyball or soccer.
- **Outdoor yoga exercise** - Organise outdoor yoga classes to encourage relaxation, balance and connection with nature.
- **Water activities** - Organise swimming activities or boat/hydrobike rides etc on nearby lakes or rivers to learn about the importance of protecting water.

During **Green Week**, a variety of activities can be carried out in the **science curriculum area**, such as:

- **Studying and analysing the biodiversity** of an area by collecting plant and animal samples, identifying and classifying them;
- **Visiting a botanical garden,** arboretum or nature reserve to study the plants and ecosystems present in those places;
- **Making a herbarium** by collecting plants and making drawings and sketches of them;
- **Urban ecology** experiences, by visiting a park or green area in a city and analysing the ecological implications of urbanisation;
- **Conducting scientific experiments** on natural resources and their sustainable use, such as experiments on recycling materials or reducing water and energy consumption;
- **Organising debates** and discussions on the impact of climate change on the environment and possible solutions to reduce greenhouse gas emissions.

There are many **geography** and **geology** activities that can be done during **Green Week**, which I will list below:

- **Identifying and classifying rocks and minerals:** students can be taught how to identify different types of rocks and minerals using characters such as colour, shape, texture and density, but they can also use digital applications for this purpose.
- **Visiting interesting geological areas:** pupils can go on a trip to an important geological area, where they can learn about the geological processes that have taken place there and their impact on the environment and local communities.
- **Mapping:** pupils can learn to interpret maps and create their own maps, using tools such as GPS or simple topographical instruments.
- **Climate study:** students can learn about how the environment is affected by climate change and how action can be taken to reduce its impact.

In the context of **Green Week**, there are a variety of non-formal activities in the field of **technology education** that can be carried out, among them:
• Building a mini-irrigation system from recycled materials to show how water resources can be saved and energy consumption reduced.
• Designing and building a simple solar panel to show how we can use solar energy sustainably.
• Creating a waste recycling and recovery project involving the use of technology tools.
• Creating an engineering project involving the construction of a prototype electric car or electric bicycle using renewable energy.

Among the ICT activities that can be implemented in Green Week, I propose:
• Develop a website or app to monitor air quality in a specific area. This activity may also involve the development of sensors to measure air quality.
• Creating video presentations or graphics highlighting environmental problems and possible solutions.
• Using online tools to calculate the carbon footprint of an individual or community and identifying solutions to reduce this footprint.
• Using apps to identify plants and animals in a given area and collect related data to map biodiversity.
• Develop games/quizzes or mobile apps to raise awareness of environmental issues and encourage students to take action to protect the environment.

e. **PART SEVEN** - You can include a self-check for the learner at the end, a checklist about competences they have got from the module.

**EVALUATION**

1. Give at least five examples of behaviours and attitudes that are relevant to environmental education and climate change:
   -
   -
   -
   -
   -

2. Environmental education aims at change and action orientation, taking into account three dimensions. Make the correspondence:

<table>
<thead>
<tr>
<th>1. The culture of complexity</th>
<th>A) Educating to act involves building competences, understood in terms of the ability to train knowledge and skills to analyse a given situation/problem, find a solution and act to implement it.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Capacity for action</td>
<td>B) The school will create bridges and meeting places, not only with the families of the students, but also with local institutions and organizations, to involve them in joint environmental projects that benefit the whole community. In this way, the school can create the context for pupils to take co-responsibility for the environment, but also teach them a model of cooperation to solve community problems.</td>
</tr>
<tr>
<td>3. Co-responsibility for the environment</td>
<td>C) Climate change education is linked to complexity education. In this context, complexity is</td>
</tr>
</tbody>
</table>
understood as a way of thinking and acting, taking into account variables such as risk, uncertainty, permanent change. Values associated with this level are: participation, valuing strategic thinking, collective responsibility.

3. A few years ago, an educational program called "Green Week" was implemented in Romanian schools. What is the aim of this programme?

4. Give examples of two activities that can be organised with students and which, in your opinion, have a great impact on the formation of an ecological attitude. Please justify your choice!

f. **PART EIGHT- Conclusion**

The correlation of human interests according to the laws of nature is the only prerequisite for the continuity of life on Earth.

Environmental protection can only be fully achieved by combining legal and administrative measures with educational ones. Changing people’s mentality is not easy, but without education in this respect, any action to protect the environment is doomed to failure.

Environmental education can be achieved in particular through schools and the media, with a logical motivation. Ecological education is based on awareness which has this single purpose - to protect nature, to make it preserve its health, on which our health, our human health, ultimately depends. Healing nature from all kinds of harmful substances in the atmosphere, soil and water cannot be done without awareness and without effective ecological training of all of us.

Ecological education starts, or should start, from early childhood. It contributes to the formation of an ecological awareness and an ecological thinking about nature, which results in a careful and correct behaviour towards it. In lessons, depending on the case, it is necessary to address ecological issues that contribute gradually to the formation of ecological awareness.

The informational and correlative values are multiple. They become effective if they are consistent and attractive.

The objectives of environmental education are equally concerned with the acquisition of skills, the acquisition of attitudes, the clarification of values and the practical approach. From a school perspective, the pupil must be helped:
- to understand that man is inseparable from his environment and that the negative effects of his actions have consequences for the environment
- to obtain the basic knowledge necessary to solve the problems of his environment immediately
- to judge individual and collective responsibilities, to engage in obtaining cooperation in solving problems
Think Green for the World

- develop tools for analysis, reflection and action to understand, prevent and correct environmental damage

On the behavioural level, to develop knowledge, problems and attitudes that take into account social values.

Environmental education will not achieve its goal if the actions it suggests to the pupil are not carried out around him - in the family, in the community in which he lives.

The effectiveness of environmental education can only be judged by the long-term effects on the behaviour of the future citizen, but the obligation to have an immediate usefulness (through practical applications, through student intervention, concrete situations) remains in force. Environmental education must show that success cannot be achieved without a judicious combination of general principles and relevant data on what is particular to a concrete situation.

In conclusion, the school has the task of organising and carrying out a lively and sustained activity on ecological education and environmental protection, and pupils, under the guidance of teachers, can and must form nature defenders. True ecological education will achieve its goal only when it succeeds in convincing pupils - tomorrow's citizens - of the need to protect nature and become active factors in the reconciliation of man and nature.

g. REFERENCES

1. Dobroță, C., Barna, A., 1996, "Ecological education, the foundation of a way of life" I The teacher as a teacher, in Marcu A. (coord), Environmental days for students in Cluj, Cluj-Napoca


Goron, A-M., 2014, Contributions to the environmental education of students through formative activities specifically designed for secondary school level - Methodological and Scientific work for obtaining the teaching degree I, Scientific coordinator: Conf. Univ. Dr. Momeu Laura


MODULE 3: ECOLOGY AND ECOSYSTEM

TABLE OF CONTENTS

PART ONE- INTRODUCTION TO THE TOPIC ................................................................. 49

PART TWO- SPECIFICATION OF THE ELEMENTS TO LEARN UNDER THIS TOPIC
INCLUDING LEARNING TASKS: ................................................................................ 52

   Element 1: Basics of Ecology ................................................................. 52
   Element 2: Components of Ecosystems .................................................... 53
   Element 3: Interactions in Ecosystems ...................................................... 53
   Element 4: Human Impact on Ecosystems ............................................... 53
   Element 5: Case Studies and Best Practices ........................................... 53
   Element 6: Importance of Ecosystems in Youth Education .................... 54

PART THREE- BEST PRACTICES WE HAVE IN OUR INSTITUTION, IN OUR CITY OR COUNTRY EVEN IN THE PARTNERS’ COUNTRIES .............................................. 54

   Partner Country: Portugal ........................................................................ 54
   Partner Country: Germany ......................................................................... 55
   Partner Country: Romania .......................................................................... 55
   Partner Country: Turkey ............................................................................... 56
PART FOUR- LINKS TO VIDEOS AND FURTHER READING SOURCES FOR THE CONTENT OF MODULE ........................................................... 56

Aspect 1: Fundamentals of Ecology .......................................................... 56
Aspect 2: Components of Ecosystems ......................................................... 56
Aspect 3: Interactions in Ecosystems ............................................................ 57
Aspect 4: Human Impact ........................................................................... 57
Aspect 5: Case Studies and Best Practices ................................................ 57
Aspect 6: The Importance of Ecosystems in Youth Education ................. 58

PART FIVE- THE IMPORTANCE OF THE MODULE IN YOUTH EDUCATION ....... 58

The Importance of the Module in Youth Education: Ecology and Ecosystems ....... 58

1. Awareness and Knowledge: ................................................................. 58
2. Critical Thinking: .............................................................................. 58
3. Action and Participation: ..................................................................... 59
4. Educating Future Leaders: ................................................................. 59
5. Collaboration and Problem-Solving: ................................................... 59

PART SIX- IMPLEMENTATION ACTIVITIES FOR THE CONTENT OF MODULE..... 59

1. Field Trips and Nature Explorations: .................................................. 59
2. Project-Based Learning: ..................................................................... 60

PART SEVEN- YOU CAN INCLUDE A SELF-CHECK FOR THE LEARNER AT THE END, A CHECKLIST ABOUT COMPETENCES THEY HAVE GOT FROM THE MODULE ................................................................. 61

Self-Check for Learners - Competence Checklist ........................................... 61

PART EIGHT- CONCLUSION ................................................................... 62

REFERENCES ......................................................................................... 63
14. PART ONE - INTRODUCTION TO THE TOPIC
We aim to provide you with a clear overview of what to expect in the upcoming sections of this module. We will touch upon the significance of studying ecology and ecosystems, emphasizing the role they play in shaping our natural world. As we progress, you'll gain insights into the interdependence of life forms, the delicate balance maintained in ecosystems, and the impact of human activities on these intricate systems.

Ecology is the science that studies the relationships between living organisms, as well as between organisms and their environment. It aims to understand how individuals, species, communities, and ecosystems interact, and the patterns and processes of these interactions in the natural world.

Ecosystem models are tools used to understand the complex relationships and processes within natural systems. By simulating the structure, functioning, and dynamics of an ecosystem, these models help predict how it may respond under various scenarios. They enable the evaluation of future changes in ecosystems, the impacts of human activities, and the consequences of different management strategies.

Specific ecosystem models are tools that focus on the characteristics and dynamics of a particular ecosystem, modeling the interactions among organisms, resources, and processes within that ecosystem in detail. These models are often developed for specific purposes, such as managing the habitat of a particular species or understanding the biological diversity within a specific ecosystem.

Specific ecosystem models;

1. **Savannas**: Savanna ecosystem models are used to understand the dynamics of savanna ecosystems by simulating interactions such as vegetation cover, rainfall, and soil type.

2. **Mountain Ecosystems**: Models of mountain ecosystems focus on simulating the structure and functioning of ecosystems in high-altitude regions, considering factors such as climate, vegetation, and topography.
3. **Polar Ecosystems**: Polar ecosystem models simulate the unique conditions of polar regions, including freezing and thawing events, ice thickness, and interactions among organisms on both land and sea.

4. **Open Ocean Ecosystems**: Models of open ocean ecosystems examine the distribution of plankton, fish, and other marine organisms, as well as factors such as feeding relationships and ocean currents.

5. **Deep Sea Ecosystems**: Models of deep sea ecosystems investigate the living conditions, feeding relationships, and biological diversity of organisms inhabiting deep ocean floors.

6. **Coastal Ecosystems**: Coastal ecosystem models analyze the structures and functions of coastal ecosystems, taking into account variables such as tides, wave action, salinity, and temperature fluctuations.

7. **Lake Models**: Lake ecosystem models focus on simulating the circulation of freshwater ecosystems, nutrient balances, interactions among aquatic plant and animal species, and other factors.

8. **Marine Ecosystems Models**: Marine ecosystem models examine dynamics such as seawater temperature, salinity, acidity, fish populations, plankton distribution, and the health of coral reefs.
9. **Grassland Ecosystems**: Grassland ecosystem models investigate factors such as grass species, grazing pressure, and soil quality to understand the structures and functions of grassland ecosystems.

10. **Agricultural and Aquaculture Systems**: These models study ecosystems shaped by human intervention, such as agriculture and aquaculture, aiming to increase productivity and minimize environmental impacts.

11. **Wastewater Treatment Systems**: Models of wastewater treatment systems evaluate the effectiveness of tools and techniques used to reduce water pollution and minimize environmental impacts.

### 15. PART TWO - SPECIFICATION OF THE ELEMENTS TO LEARN UNDER THIS TOPIC INCLUDING LEARNING TASKS:

In this section, we will outline the key elements and learning tasks that constitute the core of our exploration into ecology and ecosystems. Each element is designed to provide a comprehensive understanding of the topic, fostering both theoretical knowledge and practical application. Let's delve into the specifics:

**Element 1: Basics of Ecology**

- **Learning Task 1**: Define and differentiate between key ecological concepts, such as ecosystems, biomes, and biodiversity.
- **Learning Task 2**: Explore the levels of ecological organization, from individual organisms to entire ecosystems.
Element 2: Components of Ecosystems

- **Learning Task 1**: Identify and describe the abiotic components (non-living) of ecosystems, including soil, water, and climate.

- **Learning Task 2**: Examine the biotic components (living organisms) of ecosystems, classifying them into producers, consumers, and decomposers.

Element 3: Interactions in Ecosystems

- **Learning Task 1**: Analyze symbiotic relationships, such as mutualism, commensalism, and parasitism, among organisms within ecosystems.

- **Learning Task 2**: Investigate predator-prey interactions and their impact on population dynamics.

Element 4: Human Impact on Ecosystems

- **Learning Task 1**: Assess the various ways human activities influence ecosystems, including deforestation, pollution, and climate change.

- **Learning Task 2**: Explore sustainable practices and conservation efforts to mitigate the negative effects of human impact.

Element 5: Case Studies and Best Practices

- **Learning Task 1**: Examine successful ecological initiatives in our institution, city, country, and partner countries.

- **Learning Task 2**: Analyze case studies illustrating the positive outcomes of applying ecological principles in real-world scenarios.
Element 6: Importance of Ecosystems in Youth Education

- **Learning Task 1:** Reflect on the relevance of ecological knowledge in shaping the perspectives and actions of today's youth.

- **Learning Task 2:** Collaborate on projects that integrate ecological concepts into educational programs for youth.

These learning tasks are designed to promote a holistic understanding of ecology and ecosystems, combining theoretical knowledge with practical applications. As we progress through the module, you will not only acquire foundational knowledge but also develop the skills to contribute to the sustainability and well-being of our planet.

### 16. PART THREE - BEST PRACTICES WE HAVE IN OUR INSTITUTION, IN OUR CITY OR COUNTRY EVEN IN THE PARTNERS’ COUNTRIES

In this section, we will explore the best practices related to ecology and ecosystems implemented in our institution, city, country, and among our partners in Portugal, Germany, Romania, and Turkey.

**Partner Country: Portugal**

*Azores Islands:* The Azores Islands are a member of the Renewable Energy Union and reported in 2018 that 86% of the electricity production on the islands was derived from renewable sources. This demonstrates significant progress in the transition to sustainable energy on the islands.

*Lisbon:* Lisbon was selected as the European Green Capital in 2020. This underscores the city’s commitment to combating climate change and building a sustainable future. Lisbon has implemented various policies and programs to promote public transportation, increase energy
efficiency, and develop renewable energy sources.

Green Energy Center Portugal: The Green Energy Center Portugal is an organization that provides research, education, and consultancy services in the fields of renewable energy and energy efficiency. The center's efforts play a crucial role in helping Portugal achieve its goals in combating climate change and ensuring energy security.

Partner Country: Germany

Solar Energy: Germany is the global leader in solar energy production. In 2022, more than 50% of the electricity generated in Germany was derived from solar energy. This signifies significant progress in Germany's transition to renewable energy.

German Environment Agency (Umweltbundesamt): The German Environment Agency is an organization that provides research and consultancy services to support national policies in environmental protection and sustainable development. The agency's efforts play a crucial role in helping Germany achieve its goals in environmental conservation and combating climate change.

German Nature Conservation Act (Bundesnaturschutzgesetz): Germany's Nature Conservation Act provides a fundamental framework for preserving the country's natural resources and managing them sustainably. The law encompasses various objectives, including the conservation of endemic species, protection of natural habitats, and the sustainable use of natural resources.

Partner Country: Romania

The National Institute of Research and Development for Forestry (Institutul Național de Cercetare-Dezvoltare pentru Silvicultură) in Romania is an organization that provides research, education, and consultancy services in the fields of forestry and biological diversity. The institute's work plays a significant role in preserving and sustainably managing Romania's forests.
Romania's Biodiversity Law (Legea nr. 131/2010 privind protecția mediului) provides a fundamental framework for conserving and sustainably managing the country's biodiversity. The law encompasses various objectives, including the conservation of endemic species, protection of natural habitats, and the sustainable use of natural resources.

Partner Country: Turkey

Turkey is also focusing on combating climate change. The country aims to achieve net-zero emissions by the year 2053. This involves developing renewable energy sources, increasing energy efficiency, and reducing carbon emissions.

Waste Management: Turkey has taken significant steps in waste management as well. The country has implemented various policies and regulations concerning the recycling and recovery of waste. As a result, the amount of waste in Turkey has been substantially reduced.

17. PART FOUR - LINKS TO VIDEOS AND FURTHER READING SOURCES FOR THE CONTENT OF MODULE

Aspect 1: Fundamentals of Ecology

- Video: "Crash Course Ecology: Introduction to Ecology" by Crash

  Course: https://m.youtube.com/watch?v=izRvPaAWgyw

- "Ecology: Concepts and Applications" by Manuel C. Molles (2023)

Aspect 2: Components of Ecosystems

- Video: "The Amazing World of Soil" by TED-Ed

  Ed: https://m.youtube.com/watch?v=OiLITHMvCeRw

Aspect 3: Interactions in Ecosystems

- Video: "Food Webs: Crash Course Biology" by Crash

Course: https://m.youtube.com/watch?v=Vtb3I8Vzlfg

- "Symbiosis: An Introduction to Biological Associations" by Douglas H. Boucher (1985)

Aspect 4: Human Impact

- Video: "A Short History of Nearly Everything: Humans and the Environment" by BBC Earth: https://m.youtube.com/watch?v=N-WZeATd4Vg


Aspect 5: Case Studies and Best Practices

- Video: "The Story of Plastic" by National Geographic: https://www.youtube.com/watch?v=iO3SA4YyEYU

Aspect 6: The Importance of Ecosystems in Youth Education

- Video: "Why We Need Nature: Oliver Sacks and the Power of Place" by The Guardian: [https://www.youtube.com/watch?v=O0veMIju1AA](https://www.youtube.com/watch?v=O0veMIju1AA)

18. PART FIVE- THE IMPORTANCE OF THE MODULE IN YOUTH EDUCATION

a. The Importance of the Module in Youth Education: Ecology and Ecosystems

Young individuals possess the power to shape the future of our planet. Having knowledge about ecology and ecosystems, developing environmental consciousness, adopting sustainable lifestyles, and making decisions that protect our planet are crucial for them. Therefore, the utilization of the Ecology and Ecosystems module in youth education is of paramount importance for the following reasons:

1. Awareness and Knowledge:
   - The module teaches young learners how ecosystems function, the relationships between living organisms, the impact of human activities on the environment, and sustainability issues. This knowledge helps them become aware of their responsibility to protect the environment and aids them in making critical decisions for the future of our planet.

2. Critical Thinking:
   - The module encourages young people to develop critical thinking skills. Students learn to evaluate different perspectives, analyze evidence, and generate solutions for complex environmental issues. These skills enable youth to make informed decisions on environmental matters.
3. Action and Participation:
   - The module motivates young individuals to take action and create solutions for environmental issues. Students can design and implement environmental awareness campaigns, implement sustainable practices, and advocate for environmental changes in their communities. These actions boost their confidence and strengthen their commitment to protecting our planet.

4. Educating Future Leaders:
   - The Ecology and Ecosystems module contributes to nurturing capable leaders seeking solutions to environmental challenges in the future. Informed, sensitive, and proactive youth will play a critical role in building a sustainable future.

5. Collaboration and Problem-Solving:
   - The module provides opportunities for students to enhance their teamwork and collaboration skills. Solving complex environmental problems requires collaboration among experts from different disciplines and volunteers. By teaching the importance of working together, sharing ideas, and problem-solving, the module equips young individuals with the necessary skills.

Implementing the Ecology and Ecosystems Module in youth education serves as a powerful tool to increase environmental awareness, contribute to the adoption of sustainable lifestyles, and inspire action for the future of our planet. This module's application will better equip the next generation to address environmental challenges and fulfill the vision of building a sustainable world.

19. PART SIX - IMPLEMENTATION ACTIVITIES FOR THE CONTENT OF MODULE

The implementation of the Ecology and Ecosystem module should include interactive activities aimed at increasing understanding, promoting practical application and instilling a sense of environmental responsibility.

1. Field Trips and Nature Explorations:
   Organize trips to local ecosystems, parks, or nature reserves. Provide students with the opportunity to observe and document biodiversity, ecosystems, and environmental conditions. This hands-on experience reinforces theoretical knowledge and establishes a connection with nature.
2. Project-Based Learning:
Assign projects that require students to design solutions for local environmental challenges. This could include creating a community garden, initiating a recycling program, or developing an educational campaign about local biodiversity.

3. Guest Speakers and Expert Presentations:
Invite guest speakers such as ecologists, environmentalists, or scientists to share their experiences and insights. This exposure to real-world perspectives enhances students' understanding of the practical applications of ecology.

4. Simulation Games:
Introduce games that simulate ecosystems. This interactive approach allows students to experience the complexities of ecosystem dynamics, the impact of human activities, and the importance of balance.

5. Ecological Initiatives:
Encourage students to implement ecological initiatives within the school, such as waste reduction campaigns, energy-saving measures, or the creation of green spaces. This not only reinforces ecological principles but also promotes a sustainable school environment.

6. Community Engagement Projects:
Collaborate with local communities to undertake projects that address environmental concerns. This could involve organizing clean-up events, tree-planting campaigns, or collaborating with local authorities on sustainable development initiatives.

7. Documentary and Discussion Sessions:
Screen documentaries or video content related to ecology and ecosystems. Follow these viewings with discussion sessions to encourage critical thinking and reflections on the presented information.

8. Interactive Workshops:
Conduct workshops on topics like composting, sustainable gardening, or wildlife conservation. Hands-on activities provide practical skills and contribute to a deeper understanding of ecological concepts.

9. Environmental Impact Assessments:
Assign students to conduct environmental impact assessments for specific human activities or
development projects. This exercise helps them analyze the potential consequences and propose
sustainable alternatives.

10. Educational Outreach Programs:
Organize educational outreach programs where students share their knowledge with peers,
younger students, or the community. This reinforces their understanding and promotes the
dissemination of environmental awareness.

20. PART SEVEN- YOU CAN INCLUDE A SELF-CHECK FOR THE LEARNER AT THE
END, A CHECKLIST ABOUT COMPETENCES THEY HAVE GOT FROM THE
MODULE.

a. Self-Check for Learners - Competence Checklist

After completing the Ecology and Ecosystems module, use the following checklist to self-
assess the competences and knowledge gained:

1. Understanding of Ecosystem Dynamics:
   - Can I explain how different components of an ecosystem interact with each
     other?
   - Do I understand the concept of biodiversity and its importance in ecosystems?

2. Awareness of Human Impact:
   - Am I aware of the various ways human activities can impact the environment?
   - Can I identify sustainable practices to mitigate human impact on ecosystems?

3. Application of Ecological Concepts:
   - Can I apply ecological concepts to real-world scenarios?
   - Have I participated in projects or activities that demonstrate the practical
     application of ecological knowledge?

4. Critical Thinking and Problem-Solving:
   - Have I developed critical thinking skills when analyzing environmental issues?
   - Can I propose solutions to local environmental challenges based on ecological
     principles?

5. Collaboration and Communication:
6. Hands-On Skills:
   - Have I acquired practical skills, such as composting or sustainable gardening?
   - Can I implement eco-friendly initiatives in my school or community?

7. Environmental Stewardship:
   - Am I committed to adopting sustainable lifestyle practices?
   - Have I taken action to promote environmental stewardship in my community?

8. Reflection and Continuous Learning:
   - Have I reflected on the impact of my actions on the environment?
   - Am I motivated to continue learning about ecological topics beyond the module?

9. Community Engagement:
   - Have I actively engaged with the local community on environmental projects?
   - Can I advocate for sustainable practices within my community?

10. Overall Competence:
    - Do I feel confident in my understanding of ecology and ecosystems?
    - Have I developed competencies that contribute to a more sustainable and environmentally conscious lifestyle?

By checking off the relevant items, learners can self-assess their progress and identify areas where they have successfully developed competences through the Ecology and Ecosystems module. This checklist serves as a tool for reflection and encourages a continuous commitment to environmental awareness and stewardship.

21. PART EIGHT- CONCLUSION

The Ecology and Ecosystems module serves as a comprehensive educational tool, equipping learners with a profound understanding of the intricate relationships within our environment. Throughout this module, participants delve into the dynamics of ecosystems, human impact on nature, and sustainable practices, fostering a sense of responsibility for the planet.
In conclusion, the module not only imparts theoretical knowledge but also emphasizes the practical application of ecological concepts. Learners are encouraged to think critically, collaborate effectively, and take meaningful actions in their communities. By exploring best practices in various countries, including Portugal, Germany, Romania, and Turkey, students gain a global perspective on environmental conservation.

The inclusion of field trips, project-based learning, and interactive workshops ensures an engaging and immersive learning experience. Exposure to expert insights, simulation games, and community engagement projects further enriches the educational journey, making it both informative and enjoyable.

As we empower the youth with knowledge and skills related to ecology, we pave the way for future leaders committed to environmental sustainability. The module's significance in youth education lies in its ability to instill a deep sense of environmental stewardship, critical thinking, and a passion for creating a sustainable future.

In implementing the activities outlined in the module, educators and institutions contribute to the development of environmentally conscious citizens who are well-equipped to address the challenges of our ever-changing world. Through this module, we not only educate but inspire the next generation to be active contributors to a healthier and more sustainable planet.

22. REFERENCES


MODULE 4

ENVIRONMENTAL ACTIVITIES WHERE INDIVIDUALS OR GROUPS INVITE OTHERS TO HELP PREVENT OR SOLVE ENVIRONMENTAL PROBLEMS

Table of Contents

PART ONE- Introduction to The Topic.............................................................................................................. 66
PART TWO- Specification of the elements to learn under this topic including learning tasks: .............................................................................................................................................................................. 68
PART THREE- Best practices we have in our institution, in our city or country even in the partners’ countries .............................................................................................................................................................................. 70
  1. Protecting and promoting the Mures Valley ......................................................................................... 70
PART FOUR- Links to videos and further reading sources for the content of module...... 73
  1. Links to videos for the content of module.............................................................................................. 73
  2. Further reading sources for the content of module................................................................................ 73
PART FIVE- The importance of the module in Youth Education................................................................. 73
PART SIX- Implementation activities for the content of module................................................................. 74
PART SEVEN- You can include a self-Check for the learner at the end, a checklist about competences they have got from the module. ................................................................................................................................. 74
PART EIGHT- Conclusion ............................................................................................................................ 75
REFERENCES.................................................................................................................................................. 75
a. **PART ONE- Introduction to The Topic**

The school should develop educational collaborations with the town hall, the local community, various NGOs, the business environment, etc. In addition to the coordinator of school and extracurricular educational projects and programmes, which exists in every school, there should be a teacher responsible for integrating the principles of sustainable development at school level, and the two should work together to open up the school to the community.

⇒ **Environmental NGOs have played an important role in climate change and environmental education** in Romania in recent years. Thus, much of the expertise in this field is now to be found in NGOs.

- NGOs can organise outdoor activities for students, contribute to the development of resources to be uploaded on online platforms for teachers and students to support climate change and environmental education.

- NGOs can provide protective equipment for pupils, teachers, involved families and volunteers before or after practical activities in school or nearby; they can provide free of charge equipment and accessories to encourage walking and cycling: neighbourhood maps for personalised routing, reflective vests and flags, etc.

⇒ **Local government can contribute by:**

- purchasing clean school transport and hiring the necessary drivers;
- investing in electric vehicle charging station projects near schools;
- developing bike lanes, paths around schools;

-66-
- providing facilities for cyclists in the vicinity of schools: changing rooms (where cyclists can change), bicycle loan, storage and repair facilities;
- organisation of infrastructure for separate waste collection in schools: bins separated into different fractions in classrooms/corridors; infrastructure allowing efficient transport of waste by class fraction from classrooms to school bins, dedicated bins for different types of materials; conclusion of appropriate contracts with sanitation companies for the collection of waste by school fractions;
- setting up a separate collection centre in some localities for objects and materials that can be reused as resources for educational projects in schools (programmes such as Trash for Teaching);
- creating facilities for educational establishments that are more sustainable.

⇒ The community can get involved in climate change and environmental education by:
- purchasing clean school transport and hiring the necessary drivers;
- investing in electric vehicle charging station projects near schools;
- developing bike lanes, paths around schools;
- providing facilities for cyclists in the vicinity of schools: changing rooms (where cyclists can change), bicycle loan, storage and repair facilities;
- organisation of infrastructure for separate waste collection in schools: bins separated into different fractions in classrooms/corridors; infrastructure allowing efficient transport of waste by class fraction from classrooms to school bins, dedicated bins for different types of materials; conclusion of appropriate contracts with sanitation companies for the collection of waste by school fractions;
- setting up a separate collection centre in some localities for objects and materials that can be reused as resources for educational projects in schools (programmes such as Trash for Teaching);
- creating facilities for educational establishments that are more sustainable.

⇒ Parents There are many ways parents can get involved:
- Accessing grants/non-reimbursable funds - e.g. to fund projects or programmes - through parents' associations to support both education and school infrastructure;
- brokering sponsorship or collaboration with specialists;
- participation in courses as guest speakers or as volunteers accompanying pupils to outdoor educational activities.

⇒ Private companies can get involved by:
- financial support for the implementation of the measures in this report, e.g. funding in-service training for teachers, non-teaching staff and support staff to complement publicly funded programmes;
- financial support to support NGOs and developers of online resource platforms for climate change and environmental education;
- creation of communities of support for schools to carry out infrastructure investment programmes for energy efficiency, building sustainability and sustainable consumption practices in schools. They can help, for example, to obtain flexible funding schemes from partners and sponsors, depending on performance in implementing technical solutions in schools; equipping disadvantaged rural/small town schools with smart labs/technology workshops for interdisciplinary and integrated study of science, technology, design and engineering;
- implementation of projects to compare energy and water consumption in several schools (energy produced/energy consumed/non-renewable energy saved); creation of an online platform to present the results in real time (building dashboard type);
- partnering with local farmers to set up vegetable gardens, vegetable gardens, greenhouses, solariums or fruit gardens on school grounds or grounds; growing certain plants, vegetables and fruit on school grounds, in the school garden, in greenhouses or on the green roof of the school can be a curriculum topic;
- specialised companies can engage in additional voluntary actions to facilitate separate collection in schools.

The role of the media in raising awareness and education on climate change and the environment at large should also be mentioned.

**Mass media can contribute by:**

- Implementing promotional campaigns (print, radio, TV and online) such as: "Recycle!", "Turn off your engine when you stop!", "Sustainable Transport to School Day";
- Organising, in partnership with certain radio or TV stations, competitions for slogans or advertisements on sustainable waste management;
- promoting environmental projects, programmes, campaigns and competitions involving schools, pupils' families and representatives of public and private institutions.

**b. PART TWO- Specification of the elements to learn under this topic including learning tasks:**

In terms of climate change and terrestrial life, students should **learn about**:
Climate change, an anthropogenic phenomenon resulting from increased greenhouse gas emissions

Human activities that contribute to climate change at global, national, local and individual levels

Climate change at local, national and global levels and how they can become catalysts and drivers of climate change due to ecological, social, cultural and economic consequences

Ways to prevent, mitigate and adapt at global and individual level, but also in different contexts

Main safety measures in case of extreme weather events and disasters caused by climate change: natural disasters, violent storms, floods, landslides, etc.

Components of the environment; local and global ecosystems; biodiversity

Reasons for environmental damage and threats to biodiversity

The fundamental role of nature for human life

Negative effects of human activities on the environment, both individually and collectively

Strategies for conservation/restoration of the natural environment (e.g. how to protect nature reserves)

As a result of educational collaboration with the town hall, local community, various NGOs, business, etc., students should be able to:

- Use specific climate change terminology
- Understand why climate change has both global and local impacts
- Analyse the environmental, social, economic and ethical impacts of climate change, including on the local horizon
- Be aware of personal contribution to climate change occurring globally
- Recognise that limiting global climate change is an essential task for everyone and that we need to re-evaluate our daily behaviours in this regard
- Support others to get involved in limiting climate change by personal example
- Collaborate with others and develop jointly agreed strategies to limit the effects of climate change
- Support biodiversity with arguments

At a behavioural level, students:

- Propose solutions to reduce his and his family's impact on climate change
- Engage in community outreach on climate change
- Implement simple action steps to limit the effects of climate change
- Promotes climate-friendly economic activities
- Shows care and empathy for plants and animals
- Adopt environmentally protective and conservationist behaviour in their daily lives
- Take a stand against the behaviour of other natural or legal persons that endanger nature or humans
- Initiate voluntary actions to protect the environment, restore flora and fauna, afforestation, creation of green spaces
- Actively involves itself in the actions of local groups for the conservation of terrestrial life

c. PART THREE- Best practices we have in our institution, in our city or country even in the partners’ countries

The best way to find out more about Lunca Mureșului Nature Park is to visit the Ceala Visitor Centre, where you will be greeted with a "Welcome!" friendly welcome and a wealth of information about the protected area. This is the headquarters of the Lunca Mures Natural Park Administration.

The Ceala Visitor Centre is located in the eastern end of the protected area, about 5 km from the centre of Arad. The Ceala Visitor Centre is one of the first buildings of its kind in Romania and aims to provide information about the Lunca Mures Natural Park, thus highlighting the uniqueness and beauty of nature in this area. The Visitor Centre, named Ceala after the forest in which it is built, was completed in 2007 and since 2013 it offers an interactive exhibition. It also hosts several outdoor events and activities, guides tourists to the park's attractions and is the perfect place to carry out educational activities about nature with pupils and students.

The Ceala Visitor Centre is involved in a series of educational programmes for pupils and students, which aim to raise awareness that limiting global climate change is a key task for everyone and that we need to re-evaluate our daily behaviour in this regard. These programmes also motivate young people to get involved in limiting climate change through personal example.

Among the projects of this institution, we give as an example:

1. Protecting and promoting the Mures Valley

Objectives:
- To protect biodiversity in the Romania-Hungary border region
- Scientific monitoring of different ecosystems;
- Protection of the Mures River Plain;
- Implementation of educational and informational programmes on nature protection for the local community.

*Argument:* The aim of this project is to ensure a sustainable development of the area and the conservation of biological diversity. Accidental pollution situations will be more effectively prevented and controlled by permanent water quality monitoring. An inventory of plant and animal species in the area will be carried out and existing problems will be highlighted. At the same time eco-tourism will be promoted for the area. These objectives correspond to the strategic development principles as outlined in the Regional Development Strategy for the Western Border Area.

2. **Improving the infrastructure needed to raise awareness and sensitize the population of the Lunca Mures Natural Park**

The *overall objective* of the project is to invest in the infrastructure of the Lunca Mureșului Nature Park for better management of habitats and species and to increase awareness of the local population and visitors. This general objective will be achieved through a series of *specific objectives*:

- reducing the impact of visitors on the habitats and species of the Lunca Mureșului Natural Park by concentrating them at the Ceala Visitor Centre and limiting access to one of the integral protection areas

- increase by 20% the awareness of local people, local public authorities and other stakeholders by

Environmental education *workshops* promoted by the *Ceala Visitor Centre*:

1. **Ink production**

*Programme description:* Using the abnormal growths of oak trees, called galls, together with water and one more (secret!) ingredient, quality ink is produced right before the children's eyes. Participants will write their names on their own bookmark using feathers, just like in the old days. (Indoor activity).

*Duration:* 50-60 min;

*Recommended age group:* 7 - 18 years;

*The activity is suitable for:* 25 - 30 pupils.

2. **Recycling paper**

-71-
Programme description: After a short introduction to recycling, participants are involved in a paper recycling process using old newspapers. At the end of the activity, the group receives as a souvenir a piece of recycled paper on which they can write. (Indoor activity).
Duration: 50-60 min;
Recommended age group: 7 - 18 years;
The activity is suitable for: 25 - 30 pupils.

3. Themed trail excursion
Programme description: The theme trail is 2.5 km long and runs through a rich meadow forest. Along the way you can admire climbing plants, ancient trees, hopefully even wild animals. Several stops are made to provide interesting information (Outdoor activity).
Duration: 80 - 90 minutes;
Recommended age group: 10 - 18 years;
The activity is suitable for: 25 - 30 pupils.

4. Bicycle tour
Description of the programme: The thematic route is about 12 km long, of low difficulty and can also be covered on bicycles (personal, or provided by the park administration at the Ceala Visitor Centre) by children, parents and grandparents. The park administration provides accompaniment and information, as with all other activities, but the trail can also be easily covered on your own, as it is well marked and, along its entire length, the trail has 6 interesting outdoor panels containing essential information about the habitats of the nature park, the species of plants and animals that live here, as well as advice on how to behave in nature.(Outdoor activity)
Duration: 100 - 120 min;
Recommended age group: 12 - 99 years;
The activity is suitable for: 10 - 15 people.
The activity is suitable for: 25 - 30 pupils.

One association, at national level this time, is Nature Talks, which does environmental education in Romania. How? It explains topics such as air pollution, food waste and recycling to children using models, experiments and games. Through the little ones, they also reach parents with the information.
The projects include:

1. Environmental School - a free environmental education project, carried out with schools and other educational institutions in Romania. This project organised interactive workshops where students learned how to take care of the environment.
2. ECO FRIENDLY HOUR - a free environmental education project with 3 activities:
- Air Pollution, which aims to learn about the sources of air pollution, raise awareness of the effects on life on earth and offer solutions.
- Food waste, in which young people learn which foods end up in the bin most often, how to store different types of food correctly and what they should do before going shopping.
- Separate collection is a programme that teaches young people how to prepare different types of waste for recycling, as well as how to reuse certain materials.

3. School in the forest - free environmental education project in the Cozieni Forest Nursery, Ilfov County. Thousands of students benefited from outdoor workshops, the most appreciated being the tree-planting activity, together with the employees of the Forestry Office.

d. PART FOUR- Links to videos and further reading sources for the content of module

1. Links to videos for the content of module

https://www.youtube.com/watch?v=W5bh1JFo43U
https://www.youtube.com/watch?v=8b2vC-ecUuU
https://www.youtube.com/watch?v=fuDYMQSzVSU
https://www.youtube.com/watch?v=t4GQzmq9rA

2. Further reading sources for the content of module

https://donorbox.org/nonprofit-blog/20-global-nonprofits-environment
https://www.teachstarter.com/gb/blog/environmental-activities-for-students-sustainability-classroom/
https://www.volunteerhq.org/blog/best-environmental-conservation-programs/
https://oceanservice.noaa.gov/ocean/earthday.html

e. PART FIVE- The importance of the module in Youth Education
f. **PART SIX**- Implementation activities for the content of module


g. **PART SEVEN**- You can include a self-Check for the learner at the end, a checklist about competences they have got from the module.

The educational project is a series of activities aimed at achieving formative objectives and actively involving people: teachers, pupils, parents, representatives of institutions with a major impact on the education of the young generation. They are put in the position of taking responsibility, deciding and organising. Produce a "**Let's be green!**" project with the following structure:

PROPOSER: .........................
TIMEFRAME: ...............................
NAME: .................................
OBJECTIVES:
- ........................................................................................................
- ........................................................................................................
- ........................................................................................................
TARGET GROUP: ....................................................
PARTNERS/SPONSORS: ..........................................................
PROPOSED ACTIVITIES:
- ........................................................................................................
- ........................................................................................................
- ........................................................................................................
EXPECTED RESULTS/REALIZATION INDICATORS (numerical or percentage):
- ........................................................................................................
- ........................................................................................................
- ........................................................................................................
MEANS REQUIRED:
- ........................................................................................................
- ........................................................................................................
- ........................................................................................................
EVALUATION TOOLS:
h. PART EIGHT- Conclusion

Could we imagine a world without forests, parks, birdsong or buzzing bees? Biodiversity (the totality of living organisms on Earth) provides food and shelter for all living things, has always inspired humans and provided them with essential resources for life. In short - nature makes our lives possible and beautiful.

Although many of us probably agree with these points, we sometimes tend to forget how important the environment is, and due to increasing anthropogenic pressure, a lot of areas or species of plants and animals are at risk, a phenomenon called biodiversity loss.

Increasing access to environmental and climate change education requires the involvement of more than just central government or teaching staff. Involvement and harmonious collaboration between NGOs, local government, communities, parents, private companies and the media are essential for the success of climate change and environmental education.

i. REFERENCES

1. Ion I. Dediu, "Encyclopedia of Ecology", Ed. Libris
2. Daniel Goleman, "Ecological Intelligence", Ed Curtea Veche
5. https://green-report.ro/proiecte-ong-ecologie-scoli/
9. https://sco
Global Change and Diseases

4.2 Didactic und curricular conception of the modules and the Learning Outcome Matrices

The curriculum is based on six modules of which the last module is about the curriculum and the learning outcome matrixes of the project. Therefore, the sixth module is only presenting the curriculum and didactic approaches and does not count into the timeframe. So, in general, the timeframe for the modules 1-5 are four hours for every module which makes 20 hours of training:
Build upon the modules and the learning outcome matrixes, the curriculum is developed. The curriculum consists of a scope and sequences, learning outcomes, instructional strategies, assessment methods, resources and materials as well as a timeframe for each module. In the following, the curriculum for the modules can be found:
**Module 1: Eco-Innovation and Sustainability Design in Green Entrepreneurship**

**Timeframe:** 4 hours of training, either consecutive or two times two hours

<table>
<thead>
<tr>
<th>Scope and Sequence:</th>
<th>Instructional Strategies:</th>
<th>Assessment Methods:</th>
</tr>
</thead>
</table>
| The module starts with an introduction to green entrepreneurship and what it is. It then continues with some videos on sustainability and (green) entrepreneurship where the learners should get a deeper knowledge. The module then continues with information and resources about eco innovation and sustainability before it ends with a self-check at the end. | The module uses different resources. At the one hand there are texts and graphics that contribute to the overall learning outcome. At the other side there are videos with different topics that can be used either as part of the module or even separately to give more information. | ▪ Presentation of groupwork  
▪ H5P tasks  
▪ Essays about green entrepreneurship  
▪ Self-reflection on what has been learned  
▪ Multiple choice tasks  
▪ Gap text to be filled with the appropriate words |

**Main Learning Outcome:**
The learners focus the intersection of eco innovation, sustainability design, and green entrepreneurship.

**Other Learning Outcomes:**
The learners experience how the areas of eco innovation, sustainability design, and green entrepreneurship come together to address environmental challenges and promote sustainable practices in business. They explore the role of ethical and social responsibility in business, emphasising the importance of aligning economic goals with ecological and social considerations.

**Instructional Strategies:**
In general it is a self-study course that can be taken either alone or in a group of two or more or the teacher can even present the slides to the students and then divide them into different groups with different sub-topics or videos that they should watch and later present to the class.

**Differentiation:**
High-ability learners will focus on eco innovation, sustainability design, and green entrepreneurship, leveraging advanced problem-solving skills to develop solutions for environmental challenges. Moderate-ability learners will navigate these concepts adeptly, elucidating key principles for fostering sustainable business practices. Low-ability learners will grasp the foundational aspects of eco innovation, sustainability design, and green entrepreneurship, understanding their fundamental impact on environmental sustainability. Regarding the other learning outcomes, high-ability learners will examine real-world case studies to evaluate businesses’ incorporation of eco innovation, sustainability design, and green entrepreneurship, proposing actionable strategies to enhance sustainability further. Moderate-ability learners will engage in discussions surrounding the ethical and social responsibilities inherent in business operations within this context, brainstorming solutions to potential challenges. Finally, low-ability learners will articulate the essence of ethical and social responsibility in simple terms, recognising its essential connection to economic, environmental, and social considerations.
## Module 2: Natural Resource Management and Sustainability in Green Innovation

**Timeframe:** 4 hours of training, either consecutive or two times two hours

<table>
<thead>
<tr>
<th><strong>Scope and Sequence:</strong></th>
<th><strong>Instructional Strategies:</strong></th>
<th><strong>Assessment Methods:</strong></th>
</tr>
</thead>
</table>
| In the first part (introduction), the learners learn something about Natural resources, management, green innovation and green entrepreneurship. They then getting shown some examples of innovation for sustainability and green entrepreneurship as well as Green Tourism. They deepen their knowledge with some videos about natural resource management and green innovation. At the end of the module, some assessment tasks can be found. | The module uses different resources. At the one hand there are texts and graphics that contribute to the overall learning outcome. At the other side there are videos with different topics that can be used either as part of the module or even separately to give more information. | - Presentation of groupwork  
- H5P tasks  
- Essays about green entrepreneurship  
- Self-reflection on what has been learned  
- Multiple choice tasks  
- Gap text to be filled with the appropriate words |

**Main Learning Outcome:**
The learners deal with the effective management of natural resources and get to know about the terms of green tourism as well as innovation in green entrepreneurship.

**Other Learning Outcomes:**
Within the module, the learners explore strategies for fostering sustainability in innovation processes. They learn to highlight the significance of preserving natural ecosystems and minimising environmental impact.

**Differentiation:**
High-Ability Learners engage with advanced readings and complex case studies, taking on leadership roles in group activities to deepen their understanding. Moderate-Ability Learners can be provided with a mix of text and video resources, offering clear explanations with visual aids. Active participation in group tasks fosters comprehension. Low-Ability Learners can be equipped with simplify explanations and guided video viewing. Structured group activities can also ensure an active participation and understanding.
Module 3: User Experiences of Green Companies

Timeframe: 4 hours of training, either consecutive or two times two hours

<table>
<thead>
<tr>
<th>Scope and Sequence:</th>
<th>Instructional Strategies:</th>
<th>Assessment Methods:</th>
</tr>
</thead>
</table>
| In the first part of the module, an introduction to the topic is given. The learners explore the concept of green companies, deal with the consumers’ behaviour towards green companies and also learn about the concept of green washing. | The module uses different resources. At the one hand there are texts and graphics that contribute to the overall learning outcome. | ▪ Presentation of groupwork  
▪ H5P tasks  
▪ Essays about green entrepreneurship  
▪ Self-reflection on what has been learned  
▪ Multiple choice tasks  
▪ Gap text to be filled with the appropriate words |

Main Learning Outcome:
The learners deal with the effective management of natural resources and explores strategies for fostering sustainability in innovation processes. They highlight the significance of preserving natural ecosystems and minimising environmental impact.

Instructional Strategies:
In general it is a self-study course that can be taken either alone or in a group of two or more or the teacher can even present the slides to the students and then divide them into different groups with different sub-topics or videos that they should watch and later present to the class.

Other Learning Outcomes:
Within the module, the learners will learn why being ‘green’ has become important, they get to understand the concept of green companies and get to know how consumer behaviours can be changed to greener behaviour. The learners will also understand the concept of greenwashing and discuss on the problems related to this concept.

Assessment Methods:
* Presentation of groupwork
* H5P tasks
* Essays about green entrepreneurship
* Self-reflection on what has been learned
* Multiple choice tasks
* Gap text to be filled with the appropriate words

Differentiation:
High-Ability learners can be equipped with advanced readings on consumer behaviour and greenwashing, taking on leadership roles in group presentations to deepen their understanding through critical analysis. Moderate-Ability Learners can be utilised a mix of text-based resources and graphics to convey key concepts clearly. Low-Ability Learners can be equipped with simplified explanations and be provided with guided activities, breaking down complex concepts like greenwashing into manageable parts with the help of visual materials.
## Module 4: Developing and Analysing Access to Finance for Green Entrepreneurs

**Timeframe:** 4 hours of training, either consecutive or two times two hours

<table>
<thead>
<tr>
<th>Scope and Sequence:</th>
<th>Instructional Strategies:</th>
<th>Assessment Methods:</th>
</tr>
</thead>
</table>
| In the first part of the module, an introduction to the topic is given. The learners explore the way of developing and analysing access to finance for Green Entrepreneurs. They are navigating through the pathway to sustainable economic development and learn about the challenges and opportunities in accessing Green Finance. | The module uses different resources. At the one hand there are texts and graphics that contribute to the overall learning outcome. | ▪ Presentation of groupwork  
▪ H5P tasks  
▪ Essays about green entrepreneurship  
▪ Self-reflection on what has been learned  
▪ Multiple choice tasks  
▪ Gap text to be filled with the appropriate words |

### Main Learning Outcome:

Focusing on the financial aspect, in this module the learners address challenges related to accessing funding for green initiatives. They learn to provide guidance on financial planning and investment strategies regarded to green companies.

### Other Learning Outcomes:

The learners define the concept of green finance and identify sources and instruments of green finance. Furthermore, they analyse challenges and opportunities in accessing green finance and therefore learn to develop strategies for securing green finance.

### Differentiation:

- High-Ability Learners can focus on advanced readings on green finance, exploring intricate financial planning and investment strategies for green companies. They can also lead group discussions, analysing complex challenges and opportunities in accessing green finance and developing innovative strategies for securing funding.
- Moderate-Ability Learners can be assisted with a mix of text-based resources and graphics, learners explore the fundamentals of green finance, identifying sources and instruments for funding green initiatives. Engaging in group activities, they discuss challenges and opportunities in accessing green finance, developing practical strategies to overcome barriers and secure funding.
- Low-Ability Learners get simplified explanations and guided activities that assist learners in understanding basic concepts of green finance, such as financial planning and investment strategies for green companies.
### Module 5: Green Entrepreneurship Culture and Business Models Ideas

#### Timeframe:
4 hours of training, either consecutive or two times two hours

#### Scope and Sequence:
In the first part of the module, an introduction to the topic is given. The learners explore the meaning of green entrepreneurship culture and business models ideas. They then get examples of the importance of green entrepreneurial culture in terms of economic, sustainability, social and societal contributions. Videos on natural resource management and an assessment at the end wrap up the module.

#### Main Learning Outcome:
In this module, the learners explore the cultural aspects of green entrepreneurship and get to know about diverse perspectives on business models.

#### Other Learning Outcomes:
Learners define the concept of green entrepreneurship culture and business model ideas. They develop their own examples of green entrepreneurship and learn how to establish a green business. Additionally, they discover the benefits of green businesses for themselves and the planet, as well as eco-friendly business ideas for green entrepreneurs.

#### Instructional Strategies:
The module uses different resources. At the one hand there are texts and graphics that contribute to the overall learning outcome. At the other side there are videos with different topics that can be used either as part of the module or even separately to give more information.

In general it is a self-study course that can be taken either alone or in a group of two or more or the teacher can even present the slides to the students and then divide them into different groups with different sub-topics or videos that they should watch and later present to the class.

#### Assessment Methods:
- Presentation of groupwork
- H5P tasks
- Essays about green entrepreneurship
- Self-reflection on what has been learned
- Multiple choice tasks
- Gap text to be filled with the appropriate words

#### Differentiation:
- **High-Ability** Learners can be engaged in in-depth discussions on the multifaceted contributions of green entrepreneurial culture to economic, sustainability, social, and societal aspects. They can lead group activities exploring diverse perspectives on business models and present advanced examples of successful green entrepreneurship. Moderate-Ability Learners can participate in group discussions to understand the significance of green entrepreneurial culture and its impact on various aspects. They should analyse examples of green businesses and collaborate with peers to develop ideas for building sustainable ventures.
- **Low-Ability** Learners receive simplified explanations and guidance to grasp the concept of green entrepreneurship culture and business models. They should be engaged in hands-on activities to identify basic examples of green entrepreneurship and understand their benefits to both individuals and the environment.