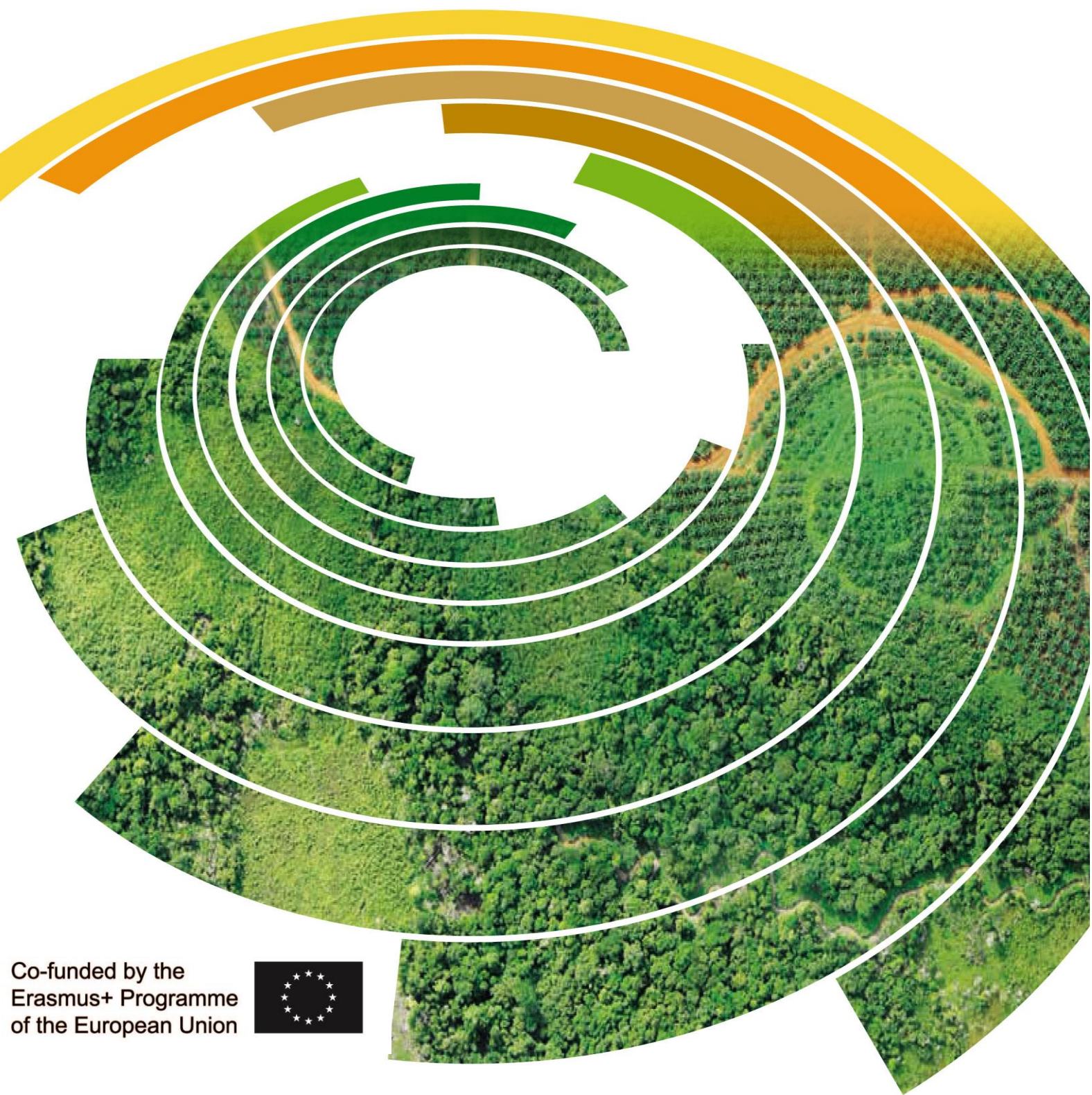




GROWING GREENING

TRAINING MODULES



Co-funded by the
Erasmus+ Programme
of the European Union



———— TRAINING MODULES ————
(Intellectual Outputs 1, 2, 3)

Aligning VET curricula to Greening and the Sustainable Development Goals



Co-funded by the
Erasmus+ Programme
of the European Union



ERASMUS+ KA2 2018-1-MT01-KA202-038471

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About Green VET 4 SDG

Aligning VET curricula to Greening and the Sustainable Development Goals

Greening is defined as the process of becoming active about protecting the environment.

The idea of **Green VET 4 SDG** project was based on the fact that we are living in a world that has become more and more conscious of the Greening issues and the environment, though yet there still exists a disconnect between Greening and VET. And this is happening in spite of the fact that both Greening and VET are strongly linked to numerous policies of the EU and most of the 17 Sustainable Development Goals, as identified by the United Nations Development Program for the year 2030.

Project partners came from four European countries, bringing each a unique field of expertise that will contribute to the overall project's outcome. Project's **objectives are**:

1. To **raise awareness** on Greening issues across all VET disciplines, linking them to the SDG priorities;
2. To **disseminate knowledge** and **deliver** relevant accredited **training** related to Greening;
3. To **include Greening** across all VET curricula through the design, development and deployment of an accredited module that can be included in any VET course curriculum or else taken separately and independently;
4. To **up-skill** and prepare **VET teachers** in the Greening and environmental issues;
5. To **provide practical examples** and involve all VET learners and local communities in Greening.

The project theme is in line with the EU priorities (ref. Maastricht Communiqué 2004, Bruges 2011) which illustrate the need for "increased relevance and quality of VET through the systematic involvement of all key partners in developments at national, regional and local level". Furthermore, the project is perfectly in line with the European Commission's priorities in promoting green growth at local and regional level.



Welcome

We have created this publication with the intention of providing a modular training material for Greening.

Our vision is to leaves a legacy through an accredited modular training material developed and deployed.

The GreenVet Team

A Joint Venture Networking

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A close-up photograph of several green wheat stalks. The stalks are filled with developing grains and have long, thin, green awns extending from them. The background is a soft-focus green field of more wheat.

Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship and strengthen governance.

INTRODUCTION

Economic growth based on the unsustainable use of natural resources is no longer viable in a world facing the pressures of a growing population, climate change and increasing risks of food shortages¹.

Against the background, ensuring the sustainability of natural resource base is crucial. Moving to a greener development path requires incorporating the environmental into every aspect of the national planning and budgeting process. A key obstacle² for many developing countries in meeting this objective is lack of capacity for identifying environmental challenge and priorities and their implications for development, policy responses formulation and strategies implementation.

Environmental resources and services are vital contributors for economic growth and people's well-being. This is particularly the case in developing countries, where natural resources sector (agriculture, mining, forestry, fishery and natural based tourism) are often engines for economic growth. It is estimated that natural capital accounts is 26% of total wealth in low-income countries, compared to only 2% in industrialized countries.

It is clear that a new approach of capacity development for environmental management is required. This approach goes beyond the traditional focus on environmental protection. It should encompass the finance, planning and line ministries, civil society groups, the private sector and local communities³.

For a long time we have:

- ignored the impact of technological progress,
- concealed the consequences of constant growth,
- followed the instruction “multiply and subdue the Earth”,
- put “having” before being,
- kept thinking as if we were still as few people on earth, as they were 200 years ago.

¹ United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Prospects: The 2017 Revision, Key Findings and Advance Tables. ESA/P/WP/248.

https://population.un.org/wpp/Publications/Files/WPP2017_KeyFindings.pdf

² UNESCO Institute for Statistics (UIS) (2010), MEASURING R&D: Challenges Faced by Developing Countries, Montreal <http://uis.unesco.org/sites/default/files/documents/measuring-rd-challenges-faced-by-developing-countries-2010-en.pdf>

³ OECD (2012), Greening Development: Enhancing Capacity for Environmental Management and Governance, OECD Publishing, Paris <https://www.oecd.org/greengrowth/green-development/49389301.pdf>



Humanity faces a profound dilemma

The economies of virtually all nations require growth to function. People with plenty are induced to acquire more and those in debt are induced to borrow more.

Yet more growth makes the wealthiest even wealthier, while unemployment, hunger and violence are widespread. And human economies are already far larger than Earth's commonwealth of life can continue to support.

SO WE HAVE TO FACE THE GROWTH DILEMMA

Because there are real, complex challenges inherent in confronting the dilemma of growth and rethinking prosperity. These are:

- **Giving up on current economy growing** means the risk of economic and social collapse
- **Maintain growth** means the risk of destroying global ecosystems that are our basis of existence
- **There are no simple answers**, none that could be proposed without proposing at the same time a transformation in the whole of the way we think, work and order our lives.

In the hands of Nobel-prize-winning Paul Krugman insists that:

Better Growth, Better Climate “may sound too good to be true, but it isn’t”

WHERE IS THE HUMAN KIND TODAY

Humans, in their behavior thinking and hoping, have remained the same. We act and live as if we are still a few in the world as we were 200 years ago.

We consume and exploit earth's resources as if there were no people after us, resulting uncountable problems for civilization such as, overpopulation, overconsumption of the rich, use of environmentally damaging technologies and bad inequalities.

Over the last two centuries, the human impact has grown dramatically, becoming strongly dominant within the Earth System in many different ways. Consumption, inequality, and population have increased extremely fast, threatening to overwhelm the many critical functions and ecosystems of the Earth System. Changes in the Earth System, in turn, have important feedback effects on the Human System, with costly and potentially serious consequences.

WE HAVE TO SET ECOLOGICAL LIMITS ON HUMAN ACTIVITIES

Global environmental problems are no longer just about producing more efficiently. In addition, consumption reduction is needed for holistic environmental and social sustainability. It's about individual and collective behavioral change.

IF WE DEFEAT NATURE WE WILL FIND OURSELVES ON THE LOSING SIDE

(Konrad Lorenz, biologist and Nobel Prize winner)

Will People after us still have the chance to live a life fit for human beings in a world that we have left for them?

Decent life demands sufficient food, sufficient living space, and opportunities for education, meaningful work, medical care, retirement provision and sufficient natural surroundings.

LET'S THINK

Around us, many people in the world – 3 times the entire population of Europe – currently have no prospect of leaving a life that truly provides human dignity (ex. Africa, countries in Asia).

The world is currently arming itself more military ever seen in the history of humanity, in addition with efficient and digital technology. For example, the US share of world arms sales is 57%, Germany could increase war material sales by 10% in the year 2017 (Stockholm International Peace Research Institute, 2018).



Sustainable Consumption

(SCP) is a holistic approach to minimizing the negative environmental impacts from consumption and production systems while promoting quality of life for all" (UNEP 2011).

Key principles of SCP are:

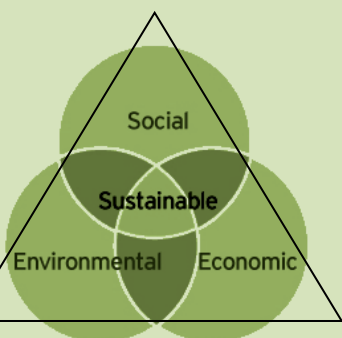
- Improving the quality of life without compromising the resource needs of future generations.
- Decoupling economic growth by promoting a shift of consumption patterns towards groups of goods and services with lower energy and material intensity
- Applying life-cycle thinking which considers the impacts from all life-cycle stages of the production and consumption process.
- Guarding against the re-bound effect, where efficiency gains are cancelled out by resulting increases in consumption (UNEP 2011).





The Iron Triangle

The iron triangle or triple bottom line model is a framework that companies use to evaluate their environmental, social, and economic performance. This framework helps us to understand what firms consider while making decisions. People, Planet and Profits.



A corporation that is sustainable by this definition enjoys profits while improving the lives of the people it is connected to and protecting the environment. While a focus on maximizing profits often leads to short-sighted business decisions, using the Triple Bottom Line leads to stronger analysis and understanding of resource availability (human, capital, and natural) and developing strategies to ensure sustainability of resources. With this kind of forward-thinking model, a sustainable business is set up for long term success.



IS THERE SOMETHING WE CAN DO?

A **sustainable development** is the promising path that leads us from today's ecological and social global crisis into the future.

WHAT DOES SUSTAINABILITY MEAN?

Sustainability is a development that satisfies the needs of the present without risking that future generation will not be able to meet their own needs. The concept of sustainability is composed of three pillars. **Economic, environmental and Social**; also known informally as profits, planet and people. For example, a factory that allows its waste to flow into a nearby body of water to avoid the short-term costs of proper disposal can cause expensive and significant long-term environmental damage.

Sustainability encourages businesses to frame decision-making in terms of years and decades, rather than next quarters earning report and to consider more factors than simply the profit of loss involved.

A similar trend has emerged in intimate consumer product such as food and cosmetics. Many companies have been criticized for exploiting cost-cutting measures, such as off-shoring production, to obtain cheaper labor. This practice, although beneficial, often comes with the price of compromised worker safety and security. This occurred in the clothing industry, following the 2013 Savor factory collapse in Bangladesh where 1100 people lost their lives. As a result, many of the companies, not sensitive to consumer backlash, have announced sustainability plans to reduce carbon footprints, packaging waist and animal suffering.

So, the first and perhaps most difficult problem, one that seldom gets addressed in the time frame, is a sustainable society. One that endures for a decade, a human lifetime or a thousand of years.

WE CANNOT JUST ADD SUSTAINABLE DEVELOPMENT TO OUR THINGS TO DO LIST. WE MUST LEARN TO INTERGRATE EVERYTHING THAT WE DO.

Moving beyond the traditional approach, the focus of capacity building for greening development needs to extend beyond environment ministries and environmental protection.

It should encompass the finance, planning and line ministries, civil society groups, the private sector and local communities.

ARE GREEN JOBS THE KEY TO SUSTAINABLE DEVELOPMENT?

Green jobs are decent jobs that contribute to preserve or restore the environment in traditional sectors such as manufacturing and construction, or in new emerging green sectors such as renewable energy and energy efficiency.

They help to:

- 🌱 Improve energy and raw materials efficiency
- 🌱 Minimize waste and pollution
- 🌱 Limit gas emissions
- 🌱 Protect and restore ecosystems
- 🌱 Support adaptation to the effects of climate change

At an enterprise level, green jobs can produce goods or provide services that benefit the environment, ex. green buildings or clean transportation.

However, these green outputs (products and services) are not always based on green production processes and technologies. Therefore, green jobs may also be distinguished by their contribution to more environmentally friendly processes; ex. green jobs can reduce water consumption or improve recycling systems. Yet, green jobs defined through production processes do not necessarily produce environmental goods or services.

KEY CONCEPT IN GREEN JOBS IS THE IDEA OF SUSTAINABILITY

Sustainability is the capacity to endure. That includes biological systems that must remain diverse and productive over time. For humans, sustainability means long-term survival and well-being, which in turn depends on the well-being of the natural world and the responsible use of natural resources. The original definition of sustainability, now 25 years old, is still relevant today.

MEETING OUR NEEDS WHILE NOT COM-PROMISING THE ABILITY OF FUTURE GENERATIONS TO MEET THEIR NEEDS

United Nations World Commission on Environment and Development



Green Jobs and ILO

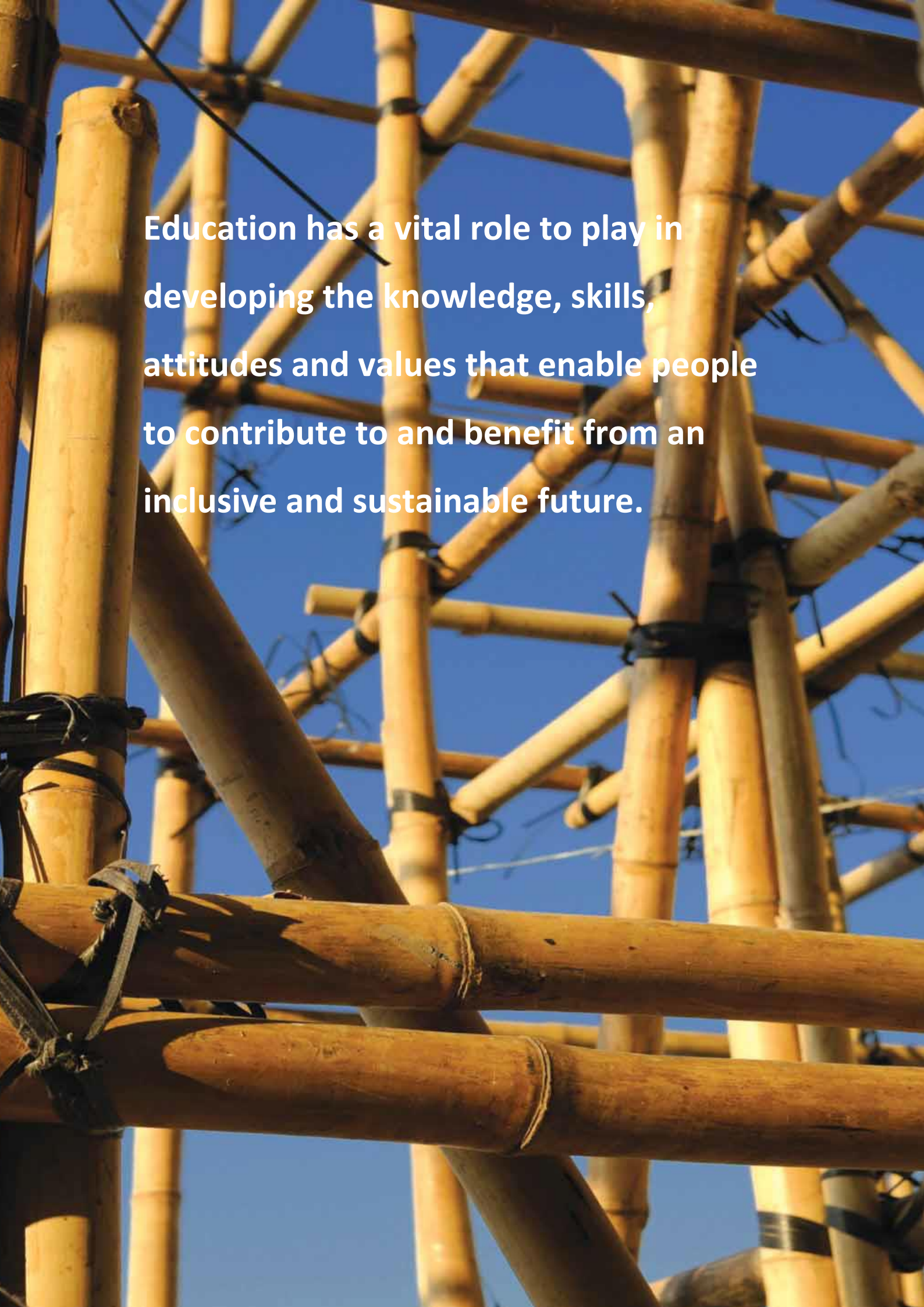
International Labor Organization

According to ILO, green jobs are central to sustainable development and respond to the global challenges of environmental protection, economic development and social inclusion. By engaging governments, workers and employers as active agents of change, ILO promotes the greening of enterprises, workplace practices and the labor market as a whole, creating decent employment opportunities and enhancing resource efficiency and low-carbon sustainable societies.

“At least half of the global workforce - the equivalent of 1.5 billion people - is affected by the transition to a greener economy”

“In the EU, 14.6 million direct and indirect jobs exist in the protection of biodiversity & rehabilitation of natural resources and forests”

“The transformation to a greener and low-carbon economy could generate up to 60 million additional jobs across economic sectors”
ILO 2012.

A low-angle, upward-looking photograph of a dense, intricate structure made of many vertical and diagonal bamboo poles. The poles are light brown and are held together by black straps or ties. The background is a clear, bright blue sky. The perspective creates a sense of height and complexity, with the poles converging towards the top of the frame.

Education has a vital role to play in
developing the knowledge, skills,
attitudes and values that enable people
to contribute to and benefit from an
inclusive and sustainable future.

GREENING CURRICULUM FOR A SUSTAINABLE ENVIRONMENT

The scope of this training unit is to disseminate knowledge and deliver relevant training related to Greening in VET at NQF/EQF Level 4.

Greening is defined as the process of becoming active about protecting the environment. The reality is that although the world has become more and more conscious of the Greening issues and the environment, yet there still exists a disconnection between Greening and VET. This is happening in spite of the fact that both Greening and VET are strongly linked to numerous policies of the EU and most of the 17 Sustainable Development Goals (SDG's) as identified by the United Nations Development Program for the year 2030.

This training module will provide answers as to why Greening is important; what can be done to support Greening; how can Greening be accomplished. Hence it will include an introduction to the economics of Greening as well as aspects about renewable energy and resources and the environment.

The unit is designed in such a way that it is universally applicable to all Level 4 learners whatever main course they might be following and whether they are vocational or academic learners. In order to achieve this, the unit design was oriented to teach about the fundamental principles of Greening and proceed by engaging the learners in generic but very effective practical case studies.

The final project by the learners would be the pinnacle of this training unit while the main objectives are:

- To **get a clear understanding** of Greening and how important it is for our VET institutions, communities and the workplace.
- To **link greening** to vocational training, so that VET students carry out environmental practices during their studies and in their future jobs.
- To **get to know** about the 17 SDGs and the 2030 Agenda.
- To **identify** the 9 SDGs which are linked with Greening.
- To **raise awareness** of the Greening issues across all VET disciplines and link them to the SDG priorities.
- To **tailor the contents**, learning activities and learning outcomes to the environmental issues prevailing in each country.
- To **provide** students with the knowledge, skills, values and motivation to act voluntarily in support of sustainable development.
- To incorporate sustainable goals into everyday life, local communities and mainstream society.



Upon completing the unit, learners should be able to:

- Explain Greening and how important it is for institutions, communities and the workplace.
- Outline the 17 SDGs and the 2030 Agenda, their connection to Greening and their integration into everyday life.
- Recognize the environmental issues and the need for sustainable development in today's world.
- Consider and evaluate the financial implications of Greening.

SKILLS

Understanding Skills	Communication Skills	Judgmental Skills	Learning Skills
Show negative consequences of development disrespectful to the environment	Present publicly Greening to an audience	Evaluate matters affecting the environment & decide accordingly	Undertake further studies by conducting independent research on Greening
Show how Quality of Life can improve through Greening	Explain the good and bad consequences of development	Evaluate, contribute and give feedback on Greening and decide accordingly	
Show pros and cons of development with respect to the environment	Explain the results of a financial analysis	Recognize the importance of greening in today's world and decide accordingly	
Illustrate the results of a financial analysis of a Greening business idea		Determine the consequences of greening not integrated in our institutions	
		Evaluate matters that affect the quality of life and make decisions accordingly	
		Analyze financially Greening issues and deduce conclusions	

COMPETENCES

At the end of this unit learners will have acquired the responsibility & autonomy to:

- Apply Greening to VET institutions, communities and the workplace
- Carry out environmental practices that relate to the SDG's
- Appraise the integration of the 17 SDGs & the 2030 Agenda in connection to Greening
- Analyze today & future's environmental issues and the need for sustainable development
- Evaluate how financial calculations lead to a decision based on feasibility in Greening
- Use financial analysis for decision-making
- Discuss how greening contributes to the quality of live today and future generations
- Compile and present a report on the Case Study analysis

KNOWLEDGE

At the end of this unit learners will:

- Understand the importance of Greening to VET institutions.
- Understand the contribution of Greening to the Quality of Life
- Know about the SDG's and their connection to life on Earth as we know it
- Know about the pros & cons of development & the implications of making it sustainable
- Work on financial implications of a Greening initiative & determine its feasibility
- Understand the importance and effect of Greening on communities
- Understand the relationship between Greening and industry and the world of work

UNIT CONTENT

1. Explain Greening & it's important for institutions, communities & the workplace

- 🌱 Explain the term Greening;
- 🌱 Explain the term Sustainability;
- 🌱 What is Sustainable Development?
- 🌱 Why is Greening important?
- 🌱 What are Green Jobs?
- 🌱 Explain the Iron Triangle: Social/Environmental/Economic.

2. Outline the 17 SDGs & the 2030 Agenda, their connection to Greening and integration into everyday life

- 🌱 What is the 2030 Agenda?
- 🌱 Explain the UNDP role and function
- 🌱 What are the SDG's?
- 🌱 Why were they defined?
- 🌱 What is the link to Greening?
- 🌱 The 9 SDG's mostly related to Greening.

3. Recognize the environmental issues and the need for sustainable development in today's world

- 🌱 What is Sustainable Development?
- 🌱 What are the implications of Sustainable Development?
- 🌱 A Case Study/Analysis of Environmental Issues & Sustainable Development

4. Consider and evaluate the financial implications of Greening

- 🌱 Discuss the Economics of a business idea
- 🌱 Financially analyze a Greening situation
- 🌱 Explain Capital Outlay
- 🌱 Explain costs
- 🌱 Explain Payback

”

Education can equip learners with agency and a sense of purpose, and the competencies they need, to shape their own Lives and contribute to the lives of others.

What knowledge, skills, attitudes and values will today's students need to thrive and shape their world?

How can instructional systems develop these knowledge, skills, attitudes and values effectively?

In the face of an increasingly volatile, uncertain, complex and ambiguous world, education can make the difference as to whether people embrace the challenges they are confronted with or whether they are defeated by them.

And in an era characterized by a new explosion of scientific knowledge and a growing array of complex societal problems, it is appropriate that curricula should continue to evolve, perhaps in radical ways.



GUIDANCE FOR TEACHING AND LEARNING PROCESS

Delivery

The unit will be delivered in a mixture of lectures, case studies and practical team activities. As an introduction to the subject, lectures will help deliver the background theoretical knowledge and necessary information to the class that will then be reinforced through the case studies and practical team activities. The learning process will then be complemented by relevant industrial visit/s and self-study.

Lecture

The lectures will be delivered either in a normally set class or in a workshop type class to enhance student engagement . Presentations and short videos will be projected and shared with the students.

Case Study

A practical case study will be given out to students. This would be linked to their normal day-to-day lifestyle and would help them become conscious and understand the implications of their way of living on greening, however small it may be.

Practical Activity

The practical activity will be a project, chosen by a team of students that will be approved by the lecturer. The project will address a current issue (personal, local, national or international) that has an influence on greening and will be analyzed and tackled by the team of students in a methodical manner as learnt during the unit delivery.

Industrial Visits

A number of relevant industrial/site visits will be organized for the class to reinforce the teaching.

Self-Study

The students are expected to revise the lessons learnt and perform personal research to expand their knowledge on the subject and also to learn on ongoing local and global greening initiatives.

Group work

Refer to practical activity above.

SYLLABUS INDICATIONS

Contents	Teaching / Learning Activities	Timing
Introduction. Definition of Greening	Brief lecture	35''
Our project in focus: why, what and how	Brainstorm ideas, make a poster and attach Post-its by category	20''
The 17 SDGs	Matching logos and SDGs; a web quest on SDGs; download app and play a game on SDGs	55''
The 9 SDGs most related to Greening	Finding out the 9 SDGs which have to do with Greening; a PowerPoint breaking down each SDG's targets and indicators; oral presentation	110''
A Short Sharp Shock or how to raise awareness at a single blow	A casual meal: measure the waste generated per person; visit a landfill to investigate how waste is managed; written assignment	55'' + 110''
Challenge as a student project: from hands-on experience to active engagement	Project	165'' (homework)

Learning Outcomes	Assessment	Assessment Criteria
1. Recall previous knowledge about environmental issues 2. Understand the importance of protecting the environment 3. Understand the concept of Greening 4. Analyse alternatives to overcome an environmental problem	A Kahoot test (teacher's toolkit)	
5. Analyse and categorise environmental problems affecting our communities, our country or the world at large 6. Positively respond to the demand for action 7. Work in groups cooperatively	A rubric on the poster created and the specific actions associated with them (teacher's toolkit).	
8. Understand and explain the rationale behind the 17 SDGs 9. Identify the 9 SDGs related to environmental issues 10. Analyse the targets and indicators each environmental SDG comprises	A rubric on the PowerPoint prepared by each group of students (teacher's toolkit).	
11. Get organized for a group meal 12. Respond to waste generated, expressing feelings and impressions derived from it 13. Analyse waste composition 14. Understand waste treatment processes and analyse problems derived from them 15. Consider our own actions and attitudes as regards protecting the environment	A handout with questions on landfill management (teacher's toolkit). A CO2 calculator to look into our own CO2 footprint (teacher's toolkit).	
16. Value the Greening process in their own VET field through a project in which a challenge is agreed upon	A rubric on the project itself and the oral presentation (teacher's toolkit).	





ASSESSMENT

Suggested Activities	no of hours	Suggested activities
Contact Hours	60	Lectures; case studies in groups; practical team activities
Supervised Placement and Practice Hours	N/A	
Self-Study Hours	60	Review and revision of unit presentations, general research and reading about the subject
Assessment	30	Project work from team activity; time constrained assessment
Total Learning Hours of this module	150	

ASSESSMENT CRITERIA





Learning Outcome	Assessment Criteria	K&U	A&A	S&E
Explain Greening and how important it is for institutions, communities and the workplace	State, giving with valid reasons how Greening is important for educational institutions	x		
	Explain in detail how Greening is important for communities in general	x		
	Recognize the importance of applying Greening in industry and at the workplace	x		
	State, giving with valid reasons how Greening is important for educational institutions	x		
Outline the 17 SDGs and the 2030 Agenda, their connection to Greening and their integration into everyday life	Outline the goal of the 2030 Agenda	X		
	Debate how the SDG's relate to Greening		x	
	Analyze how the 17 SDGs affect local community's life		x	
Recognize the environmental issues and the need for sustainable development in today's world	Appraise the given case study about greening from knowledge gained on the subject			x
	Propose a project that addresses a current issue that has an influence on greening.			x
Consider and evaluate the financial implications of Greening	Calculate the financial costs and savings of a Greening case study presented to you		x	
	Participate in own proposed project that addresses a current issue that has an influence on greening			x
* To achieve each outcome a learner must satisfy the abovementioned assessment criteria K&U – Knowledge and Understanding / A&A – Analysis and Application / S&E – Synthesis/ Evaluation/ Create				

RESOURCES

-  Classroom
-  Whiteboard
-  Projector
-  Large room with grouped tables for team activities

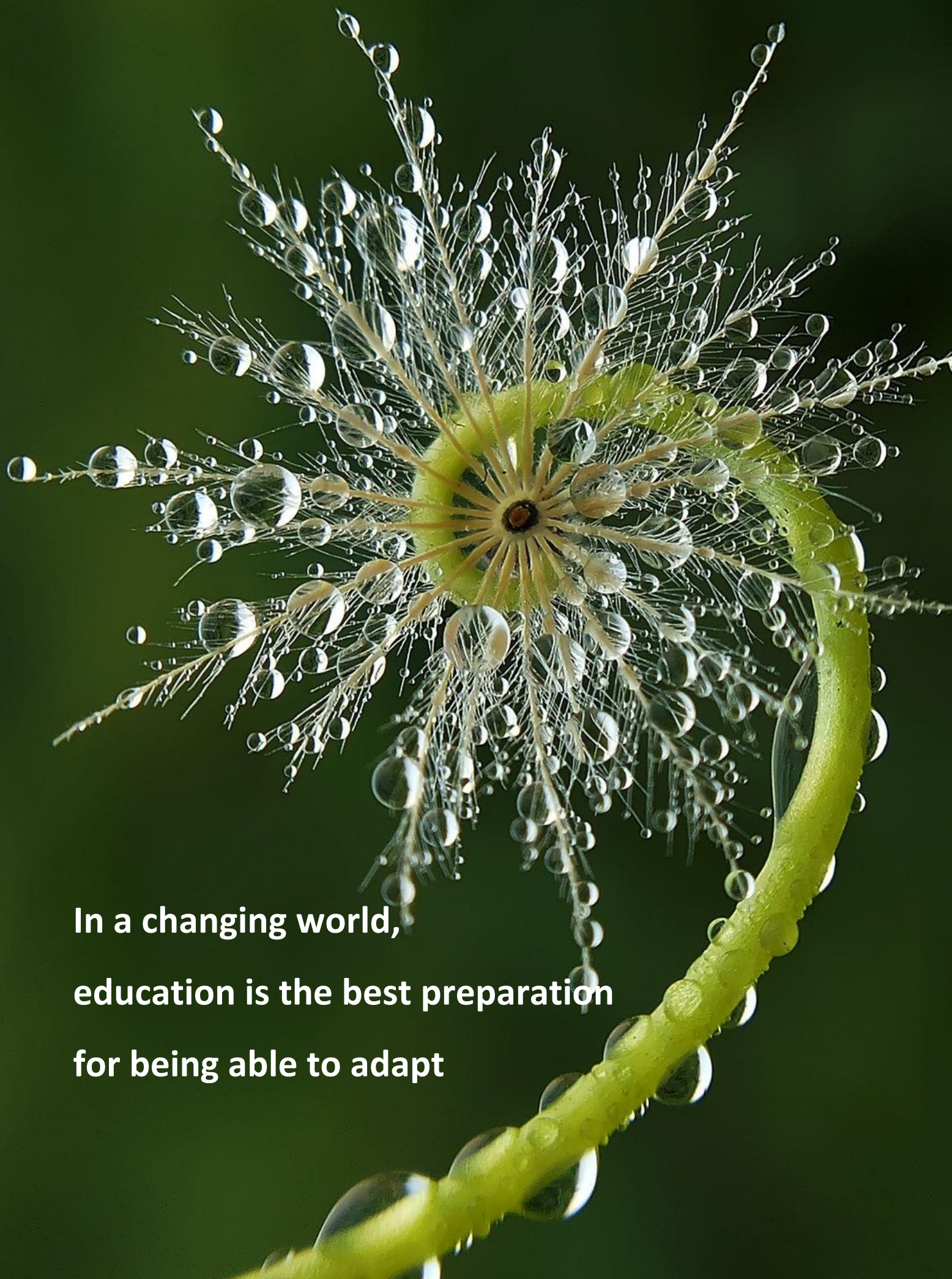
INDICATIVE READING LIST

Textbooks

-  Greening Technical and Vocational Education & Training available at https://unevoc.unesco.org/up/Greening%20technical%20and%20vocational%20education%20and%20training_online.pdf
-  The Green Guide for Universities available at <http://www.iaruni.org/sustainability/green-guide>
-  Cedefop (2019). Skills for green jobs: 2018 update. European synthesis report. Luxembourg: Publications Office. Cedefop reference series; No 109. <http://data.europa.eu/doi/10.2801/750438>
-  Canto-Sperber, M. and Jean-Pierre Dupuy (2001), “Competencies for the Good Life and the Good Society”, in Rychen, D. and L. Salganik (eds.), Defining and selecting key competencies, Hogrefe & Huber, <http://www.voced.edu.au/content/ngv:18652> (accessed on 07 December 2017).

Websites

-  UNESCO-UNEVOC at <https://unevoc.unesco.org/home/>
-  International Alliance of Research Universities (IARU) at <http://www.iaruni.org/>
-  Basque Centre of Research and Applied Innovation in VET (TKNIKA) <https://tknika.eus/en/>
-  UNESCO Digital Library <https://unesdoc.unesco.org/>
-  CEDEFOP – European Center for the development of vocational Training <https://www.cedefop.europa.eu/en>



**In a changing world,
education is the best preparation
for being able to adapt**

MODULE 1 - SUSTAINABILITY & EDUCATION FOR SUSTAINABLE DEVELOPMENT

“Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalized within nations and within broad areas of concern (environmental, economic, and social). These compartments have begun to dissolve. This applies in particular to the various global ‘crises’ that have seized public concern. These are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one”. (World Commission on Environment and Development, 1987).

There is no single home for sustainability. It doesn't belong to any specific academic discipline or school subject line. Nor is it the domain of any sector – environmentalists, educators, business or government. It is everybody's business. Most people do have some rudimentary understanding of what sustainability means. However, a sustainability literate person will have sufficient knowledge and understanding to talk to others in a positive and engaging way about matters relating to sustainable development. They will be able to make a coherent argument for why change in behavior is needed and how it might happen in practice, drawing examples from their own sphere of influence and operation and linking that to their own values and to the wider context in which they live. They will be able to make links between the social, environmental and economic aspects of sustainability and make connections between their neighborhood, their workplace and what is happening globally. Expressed at the highest level, a sustainability literate person would be expected to:

- understand the need for change to a sustainable way of doing things, individually and collectively
- have sufficient knowledge and skills to decide and act in a way that favors sustainable development
- be able to recognize and reward other people's decisions and actions that favor sustainable development.

A sustainability literate person will be equipped with a number of intellectual and practical tools that enable them to take decisions and act in a way that is likely to contribute positively to sustainable development. They will be able to make decisions on specific matters, such as advising on financial investment, buying food or writing new policy for prisons, by applying the 'at the same time' rule - that is, taking environmental, social and economic considerations into account simultaneously, not separately.



SUSTAINABLE DEVELOPMENT

The term 'sustainable development' gained currency after the 1992 Earth Summit in Rio de Janeiro. In effect, over 170 governments agreed that human development aspirations and the capacity of the environment to support them were on a collision course. Sustainable development became the overarching policy framework within which governments would seek to address the challenges of unsustainable development patterns. At the time, the most widely used definition described sustainable development as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*.

During the International UN Conference on Environment and Development in Rio (1992), the need to re-orient education worldwide in order to be consistent with the challenges and the demands of sustainable development was recognized as a priority. In this respect, Agenda 21 (21st century) of the Rio Summit called for re-orientation of EE towards sustainability. In Chapter 36, it states:

"Education, including information and sensitization of citizens and training, must be recognized as a process through which individuals and society can put to good use fully their potential. Formal and non-formal education is vital for the adoption of attitudes responsible for the assessment and facing issues related to sustainable development". Agenda 21 highlights, among others, the significance of involving students and schools in activities in national parks, areas of natural/ecological interest, etc. In 1997, five years after the Earth Summit, the international Conference on "Environment and Society: Education and Public Awareness for Sustainability" took place in Thessaloniki, aiming to highlight the significance and the role of education in the accomplishment of sustainability. This Conference adopted the relevant term "Education for Environment & Sustainability" (EfES) that incorporated issues of environmental degradation, poverty, food supplies, safety, human rights and peace (Scoullou, 1998).

At the 2002 Summit on Sustainable Development in Johannesburg, world leaders reaffirmed their commitment to sustainable development and agreed that the top challenge was implementation. The role of education was agreed by the UN General Assembly to be critical to success, and a Decade of Education for Sustainable Development will be started in 2005.

Having this in mind, education can develop new links among educational and developmental policies. In this respect, the ESD strategies must not isolate the environment from the concern for development; neither put the decisions for economic development or environmental protection exclusively in the sphere of science, separating them from the related ethical issues and values. In fact, ESD must bring together the essential but scattered pieces of the “puzzle of life”, so that development is not considered only an economic issue or a permanent threat to the environment, but the total of rational and ethical choices which support the vision of sustainable future.

The conclusions of the Johannesburg Summit of 2002 make repeated references to ESD, and recognizing education as an important parameter of sustainability they emphasize the need for inclusion of sustainable development in all educational systems at all levels. It appears that in countries with a strong EE (environmental education) tradition, ESD tends to build upon EE structures and policies already in place, particularly in countries that have interpreted EE broadly to include social, economic and political dimensions. In countries where such a tradition is absent or weak at best, ESD appear to have provided an opportunity to create new structures from scratch and a possibility to catch up with those countries that already had a strong EE tradition. When analyzing the regional synthesis reports and the regional strategies, one can find three different ways of viewing the relationship between EE and ESD which resemble some of the ones identified in the ESD debate held in 1999 (Hesselink, F.). The way the relationship is perceived tends to be related to the historic role EE has played in a country (prominent or marginal) and the way EE itself is interpreted (broad or narrow). In other countries with a strong EE tradition, it may be interpreted more broadly, in tune with the Tbilisi Declaration, to include socio-economic and political aspects. When interpreted as such, EE and ESD become almost synonymous.





Environmental education has been firmly established over time and in the spirit of the forward-looking Tbilisi Declaration. It is viewed broadly to include issues of poverty, inequity, values and ethics. The emergence of ESD is not necessarily seen as an opportunity for renewal or reform but rather as a distraction of the good work that is already being done in the name of EE. In the worst cases, ESD might actually have a negative effect on the good work done under EE as this field is no longer seen as up-to-date or relevant by policy-makers and donors since it does not reflect ESD supported by, for instance, the ESD and the international community. Two responses within this view of the relationship between EE and ESD can be seen. In some countries, EE continues to evolve and remains popular because people can identify better with it than with ESD. In other countries, where the government has joined the international group of nations that committed themselves to ESD, groups are strategically or pragmatically adopting ESD, without necessarily changing their EE practice in order to remain eligible for funding and government support. In the latter case, one can sometimes see the emergence of EE for sustainable development or EE for sustainable societies.



Whereas, in some of its forms, EE narrowly focuses on environmental protection, natural resource management and the conservation of nature, ESD constantly goes further by bringing in socio-economic, political and cultural dimensions. In a sense, EE had become outdated and needed to be upgraded and replaced by ESD to better focus not only on the Planet but also on the People and Prosperity aspects of environmental and sustainability issues. In some parts of the world, the emergence of ESD has provided a stimulus for EE reform in this way and in countries where there was no tradition in EE or where it was marginally present; the ESD movement provided an opportunity for a jumpstart. ESD and EE are distinct, although they do overlap and both are legitimate and necessary. The old EE infrastructure and existing programs therefore, will need to be still supported and government support for ESD should not be at the expense of EE. At the same time, the development of ESD needs to be supported as well as it adds important new dimensions that EE does not address or only addresses lightly (e.g., the socio-economic and cultural dimensions).

As a result, parallel policy streams and support mechanisms exist: one focusing on EE and another on ESD. Sometimes coordination mechanisms are in place to assure that the EE stream is also informed by the ESD stream and vice versa.



Education for sustainable development can promote:

- 🌱 a greater awareness and sensitivity for the relationship of human beings and the natural world
- 🌱 the willingness and ability to take part in shaping one's immediate surroundings towards a sustainable development
- 🌱 an openness for cultural diversity and the development of global citizenship.

Sustainable development is progressing and achieving our economic, social and environmental goals together, as a mutually reinforcing system. The challenge is not to run away from the words 'sustainable development' but to give them resonance and a practical meaning for all people.

The overall goal is to integrate the principles, values and practices of sustainable development into all aspects of education and learning. This educational effort will encourage changes in behavior that will create a more sustainable future in terms of environmental integrity, economic viability and a just society for present and future generations. As such ESD seeks to prepare people to cope with and find solutions to problems that threaten the sustainability of the planet.

UNESCO has emphasized that ESD should be locally relevant. It should be based on local needs, perceptions and conditions. It should acknowledge that fulfilling local needs often has international effects and consequences. It should build civil capacity for community-based decision-making, social tolerance and quality of life. Moreover ESD is interdisciplinary: no one discipline can claim ESD as its own. However all disciplines can contribute to ESD.





UNESCO has studied a wide range of these pressing issues and identified the following as the most serious:

- 🌱 The rapid growth of the world's population and its changing distribution
- 🌱 The persistence of widespread poverty
- 🌱 The growing pressures placed on the natural environment
- 🌱 The continuing denial of democracy and human rights and the rise of conflict and violence
- 🌱 The very notion of 'development' itself.

These factors are probably more accurately regarded as symptoms rather than as causes as they themselves are the consequences of thinking, values and practices in social, economic and political affairs that have put the world on an 'unsustainable' path. It is, therefore, not only necessary to deal with the problems discussed below, but even more essential to get our thinking right: to see the interrelations among these problems and recognize the fundamental need to develop a new perspective rooted in the values of sustainability. It is this need which makes education the key to creating a sustainable future.

In 1950, the estimated population of the planet was 2.5 billion. By the year 2000, it is projected to grow to more than six billion and by the year 2025 to more than eight billion. Population pressures are undeniably a factor in the degradation of environments. Moreover, population pressures are increasing most rapidly in the regions of the world where resources for coping with the requirements and demands of growing numbers are most limited. Between 1990 and 1995, an estimated 94% of total population growth occurred in the less developed regions and only 6% in the more developed regions. While fertility rates are declining in all major regions of the world in response to improved access to education, health and social services, especially by women, rapid population growth is projected to continue well into the 21st century. By even the most optimistic scenarios, the world's population will nearly double before it stabilizes. The predictable consequences of such growing population pressures, especially in already densely populated and poor countries, include rapid urbanization, possible further reductions in living standards, lower per capita investments in education and health and increased environmental distress and degradation. Less predictable outcomes might include a rise in violence or even war, large-scale migrations and escalating poverty and famine. While many of the worst consequences could possibly be avoided by early preventive action, the record of past decades provides little support for optimism or complacency in this regard.

In pursuing this objective, measures of development such as the UNDP's Human Development Index, which seeks to take account of the many dimensions of human well-being, would be extremely helpful in focusing attention on the ends that development must serve rather than on means, such as increased production, alone.

None of the factors discussed above can be examined or acted upon in isolation from the others. They are in constant interaction. Violence, for example, is, at once, a cause of poverty and its consequence. Growing populations place increasing stress on ecosystems, but human activity by contributing to climate change further intensifies population pressures through desertification and rising ocean levels. The issues, moreover, are not only related to one another in a physical manner, but also in a psychological sense. How people think about the issues – their knowledge, beliefs, attitudes and especially their values – is as important in the search for solutions as the 'objective realities' confronted.

It is also essential to take account of the varying circumstances in which people around the world find themselves and the impact of their situation upon their priorities and values. To an individual living in rural poverty in the developing world, 'sustainable development', if it is to make any sense, must mean increased consumption and a higher living standard. By contrast, to an individual in a wealthy country, with a closet full of clothes, a pantry full of food and a garage full of cars, 'sustainable development' could mean more modest and carefully considered consumption. Similarly, the issue of inter-generational parity and justice, inherent in discussions of sustainable development, will raise very different questions and choices in a country with a rapidly growing population, nearly half of which is under twenty years of age, than in a country with a stable and aging population.

In sum, the puzzle of sustainable development cannot be solved by concentrating on the pieces. It has to be seen as a whole – in both its scientific and social dimensions – not as a series of isolated issues and problems. In the final analysis, sustainable development is humanity's response to an emerging global challenge and crisis.





2030 AGENDA FOR SUSTAINABLE DEVELOPMENT AND SDG's

Transforming our World: the 2030 Agenda for Sustainable Development including its 17 Sustainable Development Goals (SDGs) and 169 targets was adopted on 25 September 2015 by Heads of State and Government at a special UN summit. The Agenda is a commitment to eradicate poverty and achieve sustainable development by 2030 world-wide, ensuring that no one is left behind. The adoption of the 2030 Agenda was a landmark achievement, providing for a shared global vision towards sustainable development for all.

The journey started in June 2012, with the "Rio+20" Conference on Sustainable Development, where Governments decided to develop global Sustainable Development Goals, building on the Millennium Development Goals but also including issues such as natural resources management, sustainable consumption and production, effective institutions, good governance, the rule of law and peaceful societies.

The reports of the Open Working Group on Sustainable Development Goals and the Intergovernmental Committee of Experts on Sustainable Development Financing formed the basis of the final Agenda package, through a series of intergovernmental negotiations in partnership with major groups and stakeholders, ensuring the broadest possible ownership of this new Agenda. In the run-up to the adoption of the 2030 Agenda, the Commission worked closely with the Member States to ensure an ambitious global outcome. It issued a first Communication "A decent life for all: ending poverty and giving the world a sustainable future" in February 2013. It was followed by Council Conclusions on "An overarching post-2015 framework" in June 2013. A second Communication "A decent life for all: from vision to collective action" was issued in June 2014 and was followed by Council Conclusions on "A transformative post-2015 agenda" in December 2014. On 5 February 2015 the Commission issued its third Communication "A Global Partnership for Poverty Eradication and Sustainable Development after 2015" which puts forward ideas on the appropriate enabling policy environment; on financing – public and private, national and international; and on monitoring and accountability. This was followed by Council Conclusions on "a global partnership for Poverty Eradication and Sustainable Development after 2015" on 26 May 2015.

The 2030 Agenda itself consists of 4 sections:

- i. a political Declaration,
- ii. a set of 17 sustainable Development Goals and 169 targets (based on the report of the OWG, with some small modifications),
- iii. means of Implementation and
- iv. a framework for follow up and review of the Agenda.

The scale, ambition and approach of the Agenda are unprecedented. One key feature is that the SDGs are global in nature and universally applicable, taking into account national realities, capacities and levels of development and specific challenges. All countries have a shared responsibility to achieve the SDGs, and all have a meaningful role to play locally, nationally as well as on the global scale. In addition, the 2030 Agenda integrates in a balanced manner the three dimensions of sustainable development – economic, social and environmental. The 2030 Agenda is also indivisible, in a sense that it must be implemented as a whole, in an integrated rather than a fragmented manner, recognizing that the different goals and targets are closely interlinked. Moreover, in order to ensure progress and long-term accountability, the 2030 Agenda includes a strong follow-up and review mechanism which will allow all partners to assess the impact of their actions. We only have one planet. We have nowhere else to go. If we use our creative powers properly, we don't need anywhere else. If we take care of it, and each other, everything we need is right here.





QUESTIONS & ANSWERS

What is sustainable development?

The most widely used definition that describes the term is “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs is sustainable development”.

What does the term “sustainability literate person” mean?

A sustainability literate person is a person who has sufficient knowledge and understanding to talk to others in a positive and engaging way about matters relating to sustainable development. They make links between the social, environmental and economic aspects of sustainability and make connections between their community, their workplace and what is happening globally.

When was the term sustainable development adopted for the first time?

The term ‘sustainable development’ was adopted after the 1992 Earth Summit in Rio de Janeiro. In effect, over 170 governments agreed that human development aspirations and the capacity of the environment to support them were on a collision course.

What are the most important highlights in Chapter 36, from Agenda 21?

The highlights in Agenda 21 are related with formal and non-formal education as a crucial segment for the adoption of attitudes responsible for the assessment and facing issues related to sustainable development.

When did the Decade of Education for Sustainable Development start, after the UN General Assembly agreed its implementation?

The role of education was agreed by the UN General Assembly to be critical to success, and the Decade of Education for Sustainable Development started in 2005.

What is the difference between EE (environmental education) and ESD (education for sustainable development)?

EE narrowly focuses on environmental protection, natural resource management and the conservation of nature. ESD constantly goes further by bringing in socio-economic, political and cultural dimensions. As a result, parallel policy streams and support mechanisms exist: one focusing on EE and another on ESD. Sometimes coordination mechanisms are in place to assure that the EE stream is also informed by the ESD stream and vice versa.

What kind of issues are identified by UNESCO as symptoms that have to be dealt through the ESD implementation?

UNESCO has studied a wide range of these pressing issues and identified the following as the most serious:

- 🌱 The rapid growth of the world's population and its changing distribution
- 🌱 The persistence of widespread poverty
- 🌱 The growing pressures placed on the natural environment
- 🌱 The continuing denial of democracy and human rights and the rise of conflict and violence
- 🌱 The very notion of 'development' itself.

How many Sustainable Development Goals are defined in the Agenda 2030?

Transforming our World: the 2030 Agenda for Sustainable Development" including its 17 Sustainable Development Goals (SDGs) and 169 targets was adopted on 25 September 2015 by Heads of State and Government at a special UN summit.

What is the crucial commitment of the Agenda 2030?

The Agenda is a commitment to eradicate poverty and achieve sustainable development by 2030 worldwide, ensuring that no one is left behind. The adoption of the 2030 Agenda was a landmark achievement, providing for a shared global vision towards sustainable development for all.

How is the 2030 Agenda set out?

The 2030 Agenda itself consists of 4 sections: (i) A political Declaration (ii) a set of 17 sustainable Development Goals and 169 targets (based on the report of the OWG, with some small modifications) (iii) Means of Implementation (iv) a framework for follow up and review of the Agenda





QUIZ

Choose the correct answer from the 4 options provided.

1. When was the Earth Summit in Rio de Janeiro held?

- a. 1994
- b. 1993
- c. 1992
- d. 1991

2. During which conference was Agenda 21 announced, and where did it happen?

- a. International UN Conference on Environment and Development in Johannesburg.
- b. International UN Conference on Environment and Development in Tbilisi.
- c. International UN Conference on Environment and Development in Belgrade.
- d. International UN Conference on Environment and Development in Rio.

3. Where was the term “Education for Environment & Sustainability” (EfES) that incorporated issues of environmental degradation, poverty, food supplies, safety, human rights and peace first adopted?

- a. Conference on “Environment and Society: Education and Public Awareness for Sustainability” took place in Tbilisi.
- b. Conference on “Environment and Society: Education and Public Awareness for Sustainability” took place in Rio.
- c. Conference on “Environment and Society: Education and Public Awareness for Sustainability” took place in Thessaloniki.
- d. Conference on “Environment and Society: Education and Public Awareness for Sustainability” took place in Madrid.

4. The Decade for Sustainable Development in 2005 was announced after which summit?

- a. At the 2002 Summit on Sustainable Development in Madrid.
- b. At the 2003 Summit on Sustainable Development in Johannesburg.
- c. At the 2002 Summit on Sustainable Development in Rio.
- d. At the 2002 Summit on Sustainable Development in Milan.

5. Education for sustainable development can promote:

- a. Openness for cultural diversity and the development of global citizenship.
- b. A greater awareness and sensitivity for the relationship of human beings and the natural world.
- c. The willingness and ability to take part in shaping one’s immediate surroundings towards a sustainable development.
- d. All the above.

6. Sustainable development is a progressive process and aims to achieve:

- a. Economic and social goals.
- b. Economic, social and environmental goals, as a mutually reinforcing system.
- c. Social and ethic goals.
- d. Environmental goals.

7. UNESCO has studied a wide range of pressing issues and identified the following as the most serious. Which issue is not correct?

- a. The growing pressures placed on the natural environment;
- b. The persistence of widespread poverty;
- c. The slow growth of the world's population and its changing distribution;
- d. The continuing denial of democracy and human rights and the rise of conflict and violence.

8. When was the 2030 Agenda for Sustainable Development announced?

- a. 2019
- b. 2005
- c. 1992
- d. 2015

9. When did the Governments decide to develop global Sustainable Development Goals, building on the Millennium Development Goals?

- a. In June 2012, at the "Rio+20" Conference on Sustainable Development.
- b. In June 2013, at the "Rio+20" Conference on Sustainable Development.
- c. In July 2014, at the "Rio+20" Conference on Sustainable Development.
- d. In July 2010, at the "Rio+20" Conference on Sustainable Development.

10. Choose the correct statement. The 2030 Agenda itself consists:

- a. a set of 17 sustainable Development Goals and 169 targets.
- b. a set of 17 sustainable Development Goals and 171 targets.
- c. a set of 16 sustainable Development Goals and 169 targets.
- d. a set of 16 sustainable Development Goals and 171 targets.

A hand holding a pencil that is a tree trunk with a green canopy. The background is a soft-focus green field with a bright light source in the upper left corner.

We have only one planet.

We have nowhere else to go.

If we use our creativity properly,
we don't need anything else.

If we take care of each other,
everything we need is right here.

MODULE 2 - COMPETENCIES FOR IMPLEMENTING SDG'S TROUGH ESD

Education for Sustainable Development (ESD) aims to develop competencies that enable and empower individuals to reflect on their own actions by taking into account their current and future social, cultural, economic and environmental impacts from both a local and a global perspective. It requires individuals to act in complex situations in a sustainable manner – to explore new ideas and approaches and participate in socio-political processes, with the objective of moving their societies progressively towards sustainable development. ESD, understood in this way aims to enable learners to take responsible actions that contribute towards creating sustainable societies now and in the future. It ‘develops the skills, values and attitudes that enable citizens to lead healthy and fulfilled lives, make informed decisions, and respond to local and global challenges’ (UNESCO, 2016: IV¹).

ESD should be understood as an integral part of quality education and lifelong learning. All educational institutions ranging from preschool to tertiary education and including both non-formal and informal education should consider it their responsibility to address sustainable development and to foster the development of key cross-cutting competencies related to sustainability. The development of these competencies is an essential contribution to efforts to achieve the Sustainable Development Goals (SDGs). ESD equips individuals not only with the knowledge to understand the SDGs, but also with the competencies to engage as informed citizens in promoting the transformation to a more sustainable society (UNESCO, 2017²).

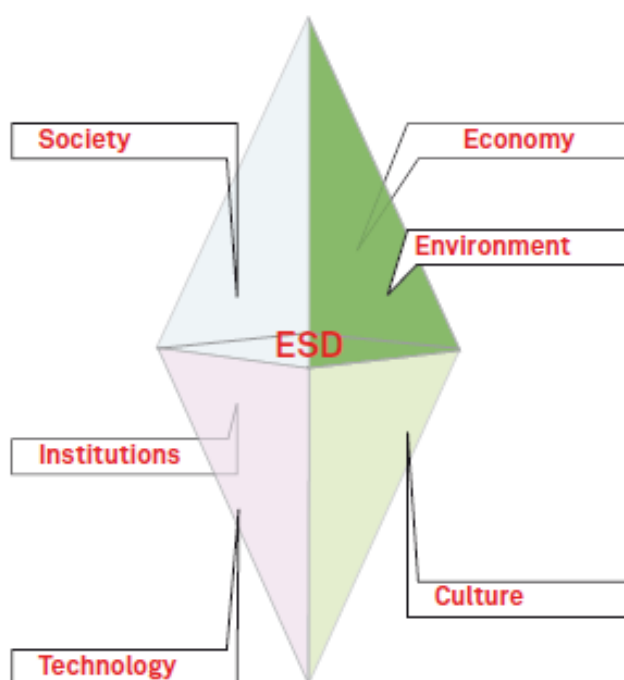
ESD consists of holistic and transformational education that addresses learning content and outcomes, pedagogy and the learning environment. In addition to including and prioritizing content on climate change, poverty and sustainable consumption in the curriculum, ESD also creates interactive, learner-centered teaching and learning settings. In essence, ESD requires a shift from teaching to learning. This takes the form of an action-oriented transformative pedagogy, characterized by elements such as self-directed learning, participation and collaboration, problem-orientation, and inter and transdisciplinarity, as well as the linking of formal and informal learning. Such pedagogical approaches are essential for the development of competencies vital for promoting sustainable development.

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1. UNESCO. 2016. Profile booklet: Key Partners of the Global Action Programme on Education for Sustainable
 2. UNESCO. 2017. UNESCO Global Action Programme on Education for Sustainable development: Information Folder. Paris, UNESCO.

THE FOUR PILLARS OF EDUCATION

Learning to learn, Learning to be, Learning to live together, Learning to do

The implementation of SDG's in schools is a process that can be realized through proper implementation of ESD. The dimensions of ESD can be presented as a double pyramid (diamond). The sides of the upper part of the pyramid represent the components of ESD, that is society, economy and the environment, whereas the sides down below represent the preconditions for the application of ESD in areas which need "changes" for its accomplishment, that is institutional rules, technology and culture. The presentation shows clearly the interdependence and the interactions of the basic components of SD. Therefore, to apply successfully (education for sustainable development) ESD we must incorporate functionally and constructively the dimensions of environmental, social, cultural, economic, technological and political issues and their interdependence in the modern world.



ESD as a double pyramid (Scoullos, 2004)

Reviewing the educational objectives from Tbilisi onwards, the following categories of aims can be reported for ESD:

- 🌱 **Information, knowledge and awareness:** To help learners become deeply aware of complex contemporary issues such as environmental degradation, poverty, gender inequality, human rights violations, non-sustainable production, overconsumption, etc.
- 🌱 **Behavior, attitudes and values:** To help learners gain experiences, adopt values for the environment and society by understanding their interdependence, as well as secure necessary incentives for their active participation in environmental protection and in improving the quality of the environment and of life, especially for the underprivileged such as the poor, women, cultural and ethnic minorities, refugees, etc.
- 🌱 **Skills/Competences:** To help learners acquire the skills necessary to identify and address contemporary issues by taking action, decision-making, using communication skills, critical thinking and investigation, problem solving, conflict management, cooperation and social behavior, etc.
- 🌱 **Participation:** To provide learners with opportunities for active involvement and to encourage collective action for resolving issues of interest, on a local scale and beyond (“think globally, act locally”). These objectives are in accordance with those of education in general, as they were set by the *International Commission for Education for the 21st Century* (Delors, 1996).
The Commission’s work resulted in the following key priorities for education:
 - 🌱 **“Learning to know”:** education should develop skills to help learners to be able to recognize, address and resolve challenges of the modern world. This educational framework opens the road for life-long learning and adaptation to ongoing and changing societal, scientific and technological knowledge.
 - 🌱 **“Learning to do”:** education should develop skills that help learners make decisions and take action on issues that concern the local community and affect the quality of life.
 - 🌱 **“Learning to live together”:** education should develop the values of **tolerance**, respect for cultural diversity, democracy, and human rights with the aim of the fruitful and peaceful coexistence of peoples.
 - 🌱 **“Learning to be”:** education should ultimately cultivate multi-faceted development and reinforce human individuality and integrity.





Sustainable development has probably more moral context than scientific: it is connected with concepts of peace, human rights and justice, as well as with theories of ecology and of environmental problems. Although it is related to the natural sciences, the economy and applied political decisions it is mainly a cultural issue. It is related with human values and ways with which people are sensing their relation to the environment, natural and social.

Additionally, it presupposes the acceptance and recognition of interdependence between humans and the natural environment, a fact which emphasizes that one should not seek to achieve social or environmental goals at the expense of others. For example, it is not possible to support the protection of the environment when half of the population of the planet lives in poverty sustainable development cannot exist long terms in a planet in which natural resources have been exhausted.” (DESD International Implementation Scheme, 2005).

Similarly, another dynamic initiative was undertaken by the 56 member-nations of the UN Economic and Social Commission for Europe (UNECE). The member countries adopted in Vilnius (2005) the **UNECE Strategy for ESD** with the primary purpose of encouraging countries to incorporate ESD into their educational systems, covering all levels from primary to tertiary including, vocational and adult, on the basis of both formal and non-formal setting. The Strategy is considered a flexible framework text to be adapted by countries according to particular problems, conditions and priorities.

Among others, it provides the critical components for the setting up of National Implementation Plans, including, inter alia: the roles and responsibilities of the relevant stakeholders, financial issues, evaluation and monitoring, as well as schemes for international cooperation. Already in 2007 the baseline country data were gathered, based on UNECE and UNESCO questionnaires, while a comprehensive set of indicators and descriptors has been finalized in 2008 by a group of international experts of UNECE. The same group developed also a core set of competences for teachers to teach ESD. All these documents are available at (www.unece.org/env/esd.html). Designated Areas and MAB/BRs offer great opportunities to implement ESD allowing all kinds of “learners” to better implement ESD in terms of developing knowledge and influencing behaviors towards the various related fields: nature protection, consumption, local management, global thinking, etc. They constitute a rich in stimuli and pleasant educational environment, an **enabling environment**, for applying in a concrete way ESD in practice.

OECD's WORK ON COMPETENCIES FOR SUSTAINABLE EDUCATION (ESD)

In 1997, the OECD launched the *Program for International Student Assessment (PISA)* to monitor the extent to which students near the end of formal education have acquired the knowledge and skills essential for full participation in society. Several international surveys have been conducted since that time comparing students' knowledge and skills in the areas of reading, mathematics, science and problem solving (see www.pisa.oecd.org).

As background to PISA, the OECD initiated the project on the Definition and Selection of Key Competencies (DeSeCo) to provide a conceptual framework for the identification of key competencies. The conceptual framework they developed classifies student competencies into three broad categories (www.oecd.org/dataoecd/47/61/35070367.pdf):

- 🌱 **using tools interactively**
- 🌱 **interacting in heterogeneous groups**
- 🌱 **acting autonomously**

OECD Education Ministers noted that sustainable development and social cohesion are specific motivations for the DeSeCo study – *“Sustainable development and social cohesion depend critically on the competencies of all of our population – with competencies understood to cover knowledge, skills, attitudes and values.”* On this basis, ESD competencies can be further classified as:

- 🌱 **subject competencies** – knowledge, facts, definitions, concepts, systems
- 🌱 **methodological competencies** – skills, fact-finding, analysis, problem-solving
- 🌱 **social competencies** – communicating, working interactively, citizenship
- 🌱 **personal competencies** – attitudes, values, ethics

With regard to competencies for ESD, the OECD is specifically interested in *knowledge* or *subject/methodological* competencies in formal education. The UNESCO Decade of Education for Sustainable Development (until 2014) and Agenda 2030 (ongoing) were/are oriented to promoting education for sustainable development, including broad changes in teaching and learning approaches to ensure sustainable lifestyles. Part of this is educating about sustainable development to develop subject and methodological competencies. However, there is still little agreement on the subject content of sustainable development, at what school levels it should be taught, and how it should be included in core curricula.





GOING BEYOND ENVIRONMENTAL EDUCATION

Knowledge and subject competencies in curricula approaches for Education for Sustainable Development tend to focus on the environment. They may refer to broad sustainable development concepts and skills (*e.g.* values, citizenship) but not generally to specific sustainable development subject matter or knowledge. Curricula guidance is needed for formal education system which goes beyond environmental education to teach students *about* sustainable development. This includes the more complex concepts and thinking related to sustainable development, including systems and measurement approaches. Subject competencies for ESD can be linked to other competencies (social and personal) and to sustainable school practices.

TEACHING ELEMENTS RELATED TO SUCCESSFUL SDG'S IMPLEMENTING THROUGH ESD

A proposed ESD subject approach according the OECD is presented in Table 1. Here, teaching progresses from giving students a solid understanding of basic economic, environmental and social concepts (primary level), to explaining interdisciplinary concepts and the need for integrated approaches (secondary level), to studying the state-of-the-art in sustainable development governance, measurement, assessments and practices (tertiary level). This approach could be adapted by countries to suit their own educational systems and culture, as generally based on the following elements:

1. **Courses** – Sustainable development should be part of core curricula at all school levels, which will differ in the degree of course integration. At primary level, the basic concepts associated with each pillar should be taught broadly as part of existing lessons or courses. At secondary level, connections between two (or more) pillars should be taught in relevant courses such as social studies, geography and science. At tertiary level, the integration of the three pillars of sustainable development should be presented in a more overarching way through stand-alone sustainable development units or courses.

2. **Concepts** -- Curricula should progress in complexity in terms of integrating the three sustainable development pillars. In primary school, a foundation in economic, environmental and social concepts should be established. At secondary level, integrative concepts and methods should be featured, including economic-environment, economic-social, and social-environment interactions. University or tertiary programs should stress: 1) the integrated assessment of the economic, environmental and social aspects of issues; 2) the longer-term intergenerational and future dimensions; and 3) the need for open and transparent governance processes to involve stakeholders.
3. **Systems** – Sustainable development concepts can be illustrated by placing them in the context of relevant systems. At primary level, economic markets (supply and demand), ecosystems (environmental diversity), and social systems (society and its actors) should be explained. The integration of these systems could be taught at secondary level through examples such as carbon trading (economic/environment), human capital (economic/social), and transport (social/environment). Systems for the full integration of the three pillars include strategies for national sustainable development (NSDS), consumption and production (SCP), and sectors such as education (ESD).
4. **Measurement** – Quantitative and qualitative approaches to measuring the three pillars and their integration should be taught together with basic concepts and systems. At primary level, these could relate to wealth (GDP per capita), ecological and carbon footprints, and participatory processes such as voting. At secondary level, examples of measuring interactions include calculating the costs of inaction on climate change (economic/environment); assessing income distribution (economic/social); and measuring happiness and well-being (social/environment). At tertiary level, comprehensive approaches for measuring sustainable development consist of sets of economic, environmental and social indicators; sustainability indices which combine these measures; and sustainability impact assessments based on these measures.





5. **Practices** – Developing subject competencies should be accompanied by practical experiences to develop social and personal competencies. Starting from the earliest years (pre-primary), participatory learning strategies can produce the attitudinal and behavioral changes and values (tolerance, solidarity) needed for sustainable development. There exist a wealth of Internet tools and other materials for applying learning in a variety of real life contexts. At primary level, these include the many environmental activities of eco-schools. In secondary school, starting *green businesses and promoting Fair-trade* products can increase understanding of positive entrepreneurship and social justice. In university, the full economic, environmental and social dimensions of sustainable consumption and production and corporate responsibility should be explored and applied.

Table 1. Proposed OECD Curricula Approach for Education for Sustainable Development

	Courses	Concepts	Systems	Measurement	Practices
Primary School	Single pillars taught broadly in general lessons	a) economic b) environment c) social	a) markets b) ecosystems c) society	a) wealth b) eco-footprints c) voters	a) fundraising b) eco-schools c) citizenship
Secondary School	Integration of two (or more) pillars taught in existing courses (e.g. social studies)	a) economic/ environment b) economic/ social c) social/ environment	a) carbon trading b) human capital c) transport	a) costs of climate inaction b) income distribution c) measures of well-being	a) green entrepreneurs b) poverty reduction c) <i>Fairtrade</i>
Tertiary Level	Integration of three pillars taught in stand-alone units (sustainable development studies)	a) economic/ environment and social b) inter- generational concerns c) participatory processes	a) sustainable development strategies (NSDS) b) sustainable consumption and production strategies (SCP) c) education for sustainable development strategies (ESD)	a) capital-based indicators b) sustainability indices c) sustainability impact assessments	a) sustainable production b) sustainable consumption c) corporate responsibility

REORIENTING EDUCATION TO SUPPORT SUSTAINABILITY

It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow. Progress increasingly depends upon the products of educated minds: upon research, invention, innovation and adaptation. Of course, educated minds and instincts are needed not only in laboratories and research institutes, but in every walk of life. Indeed, access to education is the *sine qua non* for effective participation in the life of the modern world at all levels. Education, to be certain, is not the whole answer to every problem. But education, in its broadest sense, must be a vital part of all efforts to imagine and create new relations among people and to foster greater respect for the needs of the environment.

“Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalized within nations and within broad areas of concern (environmental, economic, social). These compartments have begun to dissolve. This applies in particular to the various global ‘crises’ that have seized public concern. These are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one.” (World Commission on Environment and Development, 1987)

Reorienting education to sustainability requires recognizing that traditional compartments and categories can no longer remain in isolation from each other and that we must work increasingly at the interface of disciplines in order to address the complex problems of today’s world. This is true both within education, where interdisciplinary is slowly and with difficulty gaining ground, and between the spheres of education, work and leisure as lifelong learning emerges as a key concept for planning and developing educational systems. It is also true as concerns the most important boundary of all: that separating those included in education systems from those who are excluded from them. These changes are not occurring nearly as rapidly as would be desired, but they are nonetheless taking shape within education at all levels.

Ultimately, sustainable development will require an education that not only continues throughout life, but is also as broad as life itself, an education that serves all people, draws upon all domains of knowledge and seeks to integrate learning into all of life’s major activities. The time when education was the activity of childhood and works the pursuit of adults is long over.





The rapid growth of knowledge has rendered the notion of schooling as a 'once and for all' preparation for life utterly obsolete. The growth of knowledge is advancing exponentially, yet not nearly as fast as the need for understanding and solutions at which it is aimed. As concerns sustainable development specifically, it is impossible to predict with reliability what will be the key issues on which people will need information in five, ten, twenty or fifty years. It is predictable, however, that such developments will not fit neatly into the existing and artificial sub-divisions of knowledge which have been in place for more than a century. Hence, understanding and solving complex problems is likely to require intensified co-operation among scientific fields as well as between the pure sciences and the social sciences. Reorienting education to sustainable development will, in short, require important, even dramatic changes, in nearly all areas.

WHAT CHANGES DOES SUSTAINABILITY REQUIRE

In spite of the considerable progress which has been made, there are still enormous barriers to reorientation of formal education to sustainability, barriers that cannot be addressed by the efforts of individual teachers or even schools, no matter how committed they might be. Effectively overcoming such barriers requires commitment by society as a whole to sustainable development. Such commitment would involve all of society's stakeholders to work collaboratively and in partnership, including industry, business, grassroots organizations and members of the public, to develop policies and processes which integrate social, economic, cultural, political and conservation goals. A sustainable society will be one in which all aspects of civic and personal life are compatible with sustainable development and all government departments at all levels of government work together to advance such a society.

Education plays a dual role, at once in both reproducing certain aspects of current society and preparing students to transform society for the future. These roles are not necessarily mutually exclusive. However, without commitment of all of society to sustainable development, curricula have tended in the past to reproduce an unsustainable culture with intensified environment and development problems rather than empower citizens to think and work towards their solution.

The role of formal education in building society is to help students to determine what is best to conserve in their cultural, economic and natural heritage and to nurture values and strategies for attaining sustainability in their local communities while contributing at the same time to national and global goals.

CURRICULUM REFORM

To advance such goals, a curriculum reoriented towards sustainability would place the notion of citizenship among its primary objectives. This would require a revision of many existing curricula and the development of objectives and content themes, and teaching, learning and assessment processes that emphasize moral virtues, ethical motivation and ability to work with others to help build a sustainable future. Viewing education for sustainability as a contribution to a politically literate society is central to the reformulation of education and calls for a 'new generation' of theorizing and practice in education and a rethinking of many familiar approaches, including within environmental education.

Education for sustainability calls for a balanced approach which avoids undue emphasis on changes in individual lifestyles. It has to be recognized that many of the world's problems, including environmental problems, are related to our ways of living, and that solutions imply transforming the social conditions of human life as well as changes in individual lifestyles. This draws attention to the economic and political structures which cause poverty and other forms of social injustice and foster unsustainable practices. It also draws attention to the need for students to learn the many processes for solving these problems through a broad and comprehensive education related not only to mastery of different subject matters, but equally to discovering real world problems of their society and the requirements for changing them.

This kind of orientation would require, inter alia, increased attention to the humanities and social sciences in the curriculum. The natural sciences provide important abstract knowledge of the world but, of themselves, do not contribute to the values and attitudes that must be the foundation of sustainable development. Even increased study of ecology is not sufficient to reorient education towards sustainability.





Even though ecology has been described by some as the foundation discipline of environmental education, studies of the biophysical and geophysical work are a necessary – but not sufficient – prerequisite to understanding sustainability. The traditional primacy of nature study, and the often apolitical contexts in which is taught, need to be balanced with the study of social sciences and humanities. Learning about the interactions of ecological processes would then be associated with market forces, cultural values, equitable decision-making, government action and the environmental impacts of human activities in a holistic interdependent manner.

A reaffirmation of the contribution of education to society means that the central goals of education must include helping students learn how to identify elements of unsustainable development that concern them and how to address them. Students need to learn how to reflect critically on their place in the world and to consider what sustainability means to them and their communities. They need to practice envisioning alternative ways of development and living, evaluating alternative visions, learning how to negotiate and justify choices between visions, and making plans for achieving desired ones, and participating in community life to bring such visions into effect. These are the skills and abilities which underlie good citizenship, and make education for sustainability part of a process of building an informed, concerned and active populace. In this way, education for sustainability contributes to education for democracy and peace.

STRUCTURAL REFORM

Reorienting the curriculum towards sustainable development requires at least two major structural reforms in education. The first is to re-examine the centralized mandating of courses and textbooks in order to allow for locally relevant learning programs. Local decision-making can be facilitated through the reform of centralized educational policies and curricula, and the formulation of appropriate syllabuses and assessment policies. Nationally-endorsed syllabuses can serve as 'broad framework documents' which provide aims and general objectives for subjects, an overview of broad content themes, appropriate learning experiences, relevant resource materials, and criteria for assessing student learning.

This type of syllabus can provide centralized accountability, while allowing schools, teachers and students to make choices about the specific learning experience, the relative depth and breadth of treatment for different topics, the case studies and educational resources used, and how to assess student achievements.

A second major area of structural reform is the development of new ways to assess the processes and outcomes of learning. Such reform should be inspired by what people want from their educational system, as well as what society needs. The period of profound change in which we are living needs to be taken into account by educational systems, which were, for the most part, designed to serve a society which is fast becoming history. Learning needs to be seen as a lifelong process which empowers people to live useful and productive lives. The reorientation of education along these lines – and in anticipation to the extent possible of future needs – is fundamental for sustainable development, including its ultimate objective not only of human survival but especially of human well-being and happiness. Similarly, there also needs to be a revamping of the methods of credentialing students. The various ways in which students are judged (testing, report cards, evaluations) and the basis for awarding diplomas at all levels need to reflect the reformulation of outcomes of learning towards sustainability.

CONTRIBUTION OF ENVIRONMENTAL EDUCATION IN THE PROCESS OF DEVELOPMENT OF ESD

It is clear that the roots of education for sustainable development are firmly planted in environmental education. While environmental education is not the only discipline with a strong role to play in the reorienting process, it is an important ally. In its brief twenty-five year history, environmental education has steadily striven towards goals and outcomes similar and comparable to those inherent in the concept of sustainability.

That work was inspired largely by the guiding principles of environmental education laid down by the Intergovernmental Conference on Environmental Education held in Tbilisi in 1977, which followed a comprehensive preparatory process which included the International Workshop on Environmental Education held in Belgrade in 1975 to draft the concepts and vision which were later taken up by governments in Tbilisi.





These encompass a broad spectrum of environmental, social, ethical, economic and cultural dimensions. Indeed, the recommendations of the Rio Conference, held fifteen years later, echo those of Tbilisi, as is evident in the following quotations from the report of the 1977 conference:

- 🌿 “A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.”
- 🌿 “A further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions. Environment should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions.”
- 🌿 “Special attention should be paid to understanding the complex relations between socio-economic development and the improvement of the environment.”

These principles were successfully translated into educational goals and, with greater difficulty, into schoolroom practice in many countries.

The motto of the environmental education movement has been: ‘think globally, act locally’. Over a period of more than two decades, it developed a highly active pedagogy based on this premise. In the early grades, in particular, the emphasis was upon learning the local environment through field studies and classroom experiments. By starting in the primary grades, before the process of compartmentalization that marks secondary and particularly higher education sets in, students were encouraged to examine environmental issues from different angles and perspectives.

INTERDISCIPLINARY

A basic premise of education for sustainability is that just as there is a wholeness and interdependence to life in all its forms, so must there be a unity and wholeness to efforts to understand it and ensure its continuation. This calls for both interdisciplinary inquiry and action. It does not, of course, imply an end to work within traditional disciplines. A disciplinary focus is often helpful, even necessary, in allowing the depth of inquiry needed for major breakthroughs and discoveries. But increasingly, important discoveries are being made not within disciplines, but on the borders between them. This is particularly true in fields such as environmental studies which are not easily confined to a single discipline. Despite this realization and a broadening support for interdisciplinary inquiries, the frontiers between academic disciplines remain stoutly defended by professional bodies, career structures and criteria for promotion and advancement. It is no accident that environmental education and, more recently, education for sustainable development, has progressed more rapidly at the secondary and primary levels than within the realm of higher education.

COLLECTIVE DECISION - MAKING

The engaged citizens of a democratic society can exercise a strong influence on behalf of sustainable development through their civic role as well as through their behavior as consumers and producers. Individual lifestyles are inevitably strongly conditioned by public policies. Sorting trash, for example, serves little purpose if the collection service then throws everything into a dump. Individual action must be complemented and supported by public policies at all levels.

In sum, in democratic societies public policy responds to the will of the people. It is here that public awareness and understanding of the need for sustainable development best expresses itself through support for laws, regulations and policies favorable to the environment. People express their preferences as they decide how to spend their money, as well as through the ballot. Public action, through voting or otherwise, is contingent on more than 'public awareness'. What is needed is an understanding of the issues, and of the likely consequences of a given purchasing or electoral decision.





For this reason, growing attention has been given in Europe and elsewhere to 'ecological audits' and labeling which allows producers of environmentally benign products to advertise this fact to the public. Electoral choices are, of course, effective in terms of sustainability only to the extent that the public is well informed. Public understanding is the foundation for people to fulfill their roles as responsible citizens, consumers and public-spirited individuals.

While sustainability is a long-term goal for human society and a process which will necessarily need to take place over time, there is a sense of urgency to make progress quickly before 'time runs out'. We are therefore faced with a tremendous challenge, a challenge of unprecedented scope, scale and complexity. We are pressed to act even as we are still working out new concepts and new methodologies. We are pushed to change structures and mindsets, yet there is no obvious path, no model which shows the way. Experimentation and innovation are the watchwords, as we search – often simply through trial and error – for adequate solutions. And we must do all this in a climate of sweeping economic, social and political change, while being exhorted to 'do more with less'.

SPECIAL NEEDED KNOWLEDGE & COMPETENCES FOR IMPLEMENTING SDG IN DIFFERENT SUBJECTS

In addition to having basic ecological and pedagogical knowledge, ***an ESD educator that follows the SDG's*** must also have the following special competencies which are acquired gradually after working in an area for some time, given his/her own relative interest and enthusiasm. Based on current beliefs that environmental protection is an integral part of an area's economic and social development, an ESD educator should especially focus on presenting successful case studies of environmental protection and social and economic development in the teaching process. Given the complex framework of international and European conventions, particularly following the introduction of the principle of sustainable development and the creation of the UN Committee for Sustainable Development (CSD), an educator must be able to present, in a clear and comprehensible manner, the institutional framework of the main international conventions and national legislations for the protection and management. Depending on the content of the educational program, reference can be made to specialized conventions, e.g. regarding birds and fishing.

SPECIAL KNOWLEDGE ON CULTURAL HERITAGE

In reference to cultural heritage, we must recall the definition of the 1972 International Convention for the Protection of World Cultural and Natural Heritage (Paris):

“Cultural heritage are the monuments (architectural works, monumental works of sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art and science) and landscapes (works of man, or the combined works of man and nature having historic, aesthetic, ethnological and anthropological value)”.

It is, therefore, advantageous for an educator to be able to present existing institutional frameworks in an educational manner using simple language and to demonstrate the need for its reinforcement by all related bodies, citizens, inhabitants and visitors. The question is not of the conventions or legislation themselves, but instead their scope and objectives that must be specified within the studied area. Archaeological sites are part of the national, cultural and natural heritage. Paths that lead to them can also comprise work areas for the educator and should be cared for accordingly.

COMMUNICATION AND SDG'S

Communication is fundamental to any educational process. In the schools and other designated areas communication takes on particular characteristics i.e. it must be carried out in a short period of time and in most cases, has no continuation. The process begins with the educator's effort to communicate with the group as a whole and individually. The theoretical approach to communication begins with some evident assumptions that describe human communication (Gotovos,1990):

- 🌱 Communication is inevitable, since the human civilizations formed.
- 🌱 Communication is shaped by two dimensions; relationship and content (meta-communication).
- 🌱 Interpersonal relationships are shaped by sequences of individual “moments of communication”.





These elements of communication are further analyzed in the following paragraphs:

A *relationship* refers to how things are said or expressed through non-verbal behavior. The manner in which we express ourselves, the pitch and tone of voice, the combination of our movements, body language (e.g. raising or lowering the shoulders), and the combination of facial movements - all transfer basic elements of communication.

Content refers to the intended meaning of a message as expressed through language, and is related to the receivers' thought processes, and abilities to understand. The content transmitted to a group of primary school students is different from that of adults that have finished high school. For example, referring to the concept of pH should be avoided with a group of children of kindergarten or primary level; and simplistic references should be avoided with adults' groups. While content is that which comprises meaning, the degree to which it is accepted (or rejected) usually is mediated by the relationship factor (the way it is expressed by the transmitter including the non-verbal behavior). Essentially, WHAT we wish to accomplish with the group and HOW we express it are equally important. It is worth noting that the relationship dimension relates to the quality of social interaction, in other words, to how equal the learners' group and the educator are, as well as to the feelings of the group: a friendly atmosphere promotes collective action; On the contrary, a negative environment or confrontation undermines common efforts. When several opinions are expressed, learners begin to realize that their own opinion is not necessarily the only possibility. Through interaction they will draw their own conclusions, which they could not have reached otherwise. The content and the relationship dimensions influence the outcome of the activity (group dynamic), in which the spontaneity of the educator is important. Group members usually do not use academic or sophisticated language, as is the case in a student-teacher dialogue. They pose direct questions on issues of interest to them and require clear answers.

QUESTIONS AND ANSWERS

An educator that promotes SDG's should answer questions spontaneously and honestly. If he/she does not know the answer to a specific question, he/she should not hesitate to reply, "I don't know, but I will look and find out and tell you the answer later".

In this case, he/she must find and provide the appropriate answer. As mentioned earlier, interpersonal relationships are determined by “sequences” of individual “moments of communication”.

Introduction is usually the first communication moment followed by moments where communication expands and deepens. If the educator’s first moment of communication is not effective or appropriate, he/she must then create a series of “corrective” moments of communication in order to restore a positive atmosphere.

An educator can develop communication strategies on two levels: (i) the personal level, where he/she has personal moments of communication or face-to-face interaction with individuals; and (ii) the group level which refers to what takes place in the presence of all group members. An educator should keep in mind the individuality of the group members and at the same time refrain from too many personal moments of communication that can influence the sequence of group communication. Communication is complimentary when occurring between individuals of different social groups, age, etc. such as a typical teacher-student communication. An educator should practice ways of communicating symmetrically and complimentary and find ways to interact with different social groups: communication strategies such as negotiation, conflict management, facilitating decision making, are crucial.

As the social identity of one is set by the social identity of another, an educator’s good mood or personal behavior can encourage similar behavior in the group. Experimental research shows group behavior and performance relates to the “leader’s” behavior and style (Xohellis, 1985). Having this in mind the educator needs to create the group dynamics in a way to enable good communication, and building on one another’s’ viewpoints. Even though the educator-learner (student or adult) relationship is, at least in the beginning, a complementary relationship among “unequals”, an educator can create conditions that will move everyone to the same level (symmetrical) where they will feel and act as “co-players”, “co passengers” or “co-researchers”.

An SDG/ESD educator always bears in mind that each person learns in their own unique way, uses their senses differently and registers information received from the environment in an individual and differentiated way. Specifically, because of the mixed character of adult groups, he/she should create conditions that allow for everyone to express, regardless of their social status and background.





Finally, an SDG/ESD educator always expresses respect towards all, avoiding emotionally-charged wording such as references to persons with disabilities, other special groups, etc. as he/she may not know the composition and particularities of the group members.

EVALUATION

Evaluation of implementation of SDG's in teaching process should be an integral part of each educational program and it may focus on its various elements, such as the extent to which the goals have been achieved, the suitability of methods and materials used, the educator's effectiveness, the learner's performance, the program's organization, the field's appropriateness, etc.

The choice of the evaluation plan depends every time on its purpose and to whom it is addressed (Ditsiou 2002). The evaluation provides feedback, outlines the program's potential and identifies problems that will have to be considered when re-designing it. The role of evaluation is mainly to shed light on the educational process and the program itself, and therefore has to be above all useful. Critical questions to be answered are "who needs the evaluation outcome?" and "who will use it?" In some cases, however, evaluation -no matter how thoroughly designed- cannot answer all potential questions (Ditsiou, 2002).

The evaluation may concern the result of the program (e.g. the reduction of litter volume that ends up in waste bins of a school unit and the corresponding increase in the recycling bins, after a recycling project) or the process (e.g. students attendance and interest in the project, disposition towards undertaking some action, etc.) or better both. Also, depending on the stage implementation it can be diagnostic (formative) or overall (summative). The applied approaches of evaluation focus heavily or lightly on the objectives (Benett, 1984; Kamarinou, 2000). In the first case, the most common, evaluation concentrates on the level of the achievement of predetermined objectives and adopts pre-designed tools (mainly questionnaires), in an attempt to measure the objectives through indicators (quantitative evaluation). The translation of objectives to expected results via measurable indicators may prove a very difficult affair, and therefore their formulation (wording) is particularly important. It is best to avoid using questionnaires as a sole evaluation tool (Ditsiou, 2002): designing and processing/interpreting a questionnaire demands a professional.

An important approach to evaluation is the qualitative one, focusing mainly in description and interpretation, as opposed to measurement or forecast. Qualitative evaluation aims to display how an educational program works; to describe how the program is influenced by the conditions of implementation; and to collect participants' views. In other words, it records the experience of attendance of all involved (designer, educator, learners) focusing mainly in the process. Evaluation can be done from the learners themselves through an anonymous evaluation sheet or discussion: A few minutes reflection on questions like "what did you appreciate most in this program?" or "was there anything missing that you would have liked to focus on more?" etc. can give direct specific feedback.

Evaluation by the educator himself/herself, as he/she knows best what is important, and therefore can judge his/her personal contribution to the program by self-assessment. It is obvious that there is no optimal evaluation method. Depending on the conditions different techniques and tools can be used, which can combine with collected data from different viewpoints. There are no ready "recipes" for evaluation that could be relied upon without second thought. It is advised to develop a 'basket' of available evaluation tools that the evaluator may adapt and adopt in the field. The evaluation can be realized with the technique what we know (this is a principle of sustainable management, it concerns the integrated management of land, water and living resources, it equally promotes conservation and sustainable use of an area), **what we want to know** (how is it applied in practice, are there cases of successful implementation, what are the parameters of success) and **what we have learned**.

CURRENT PEDAGOGICAL METHODS AND TOOLS APPLIED IN ESD

ESD includes many interesting and innovative methodological approaches based on active participation and experiential learning. Learning that is based on learners' experiences and initiatives is considered to be more effective (Trikaliti & Palaiopoulou, 1999). This chapter presents the most widely-used methods appropriate for SDG's in designated areas.





FIELD VISITS AND RESEARCH

Two of the most common methods of educational programs in designated areas are the field visit and the field research. The term “field” refers to the natural, cultural and social environment including a wide range of sites (such as wetlands, coasts, streams, forests, neighborhoods, settlements, rural, archaeological and industrial sites, etc.) appropriate for implementing an ESD program. Direct experiential activities organized in the field, provide learners with the opportunity to gain a better understanding of the complex interrelations between the natural, cultural and economic environment. Especially for students, such activities bridge school knowledge to real life. In formal education field activities are those that take place outside the typical classroom. These can be either “field visits” or “field researches”, the former being more of an excursion or guided tour and the latter involving a strong research component.

For a field visit to be effective and not simply another excursion, it should be conducted with a specific objective or task, depending on ages and interests of the learners and on the area of the visit. Field activities must be meaningful, stimulating and provide learners with an opportunity to interact with the area (Marcinkowski et al., 1990; Kamarinou, 2000). For young children, who are curious and enthusiastic, the activities should aim to the development of their interest in the environment, particularly through the senses. Adolescents and adults are able to conduct more complex and demanding tasks (Lahiry et al., 1988).

For example, in a small river or beach where illegal waste disposal is tolerated by the local residents, a field visit should aim to look at the consequences of uncontrolled waste disposal. While primary school children can be involved in observation, collection, taxonomy, and drawing activities, secondary students can take part in activities such as sampling and laboratory analysis, surveying the local residents’ views, etc.

Whether it is a simple visit or a complex research project, every field intervention can be broken down into three stages: before, during and after the visit: for each one the ESD/SDG educator is called to organize a series of actions so that the activity is successful and effective. Based on the existing literature, a series of such activities for all three phases follows. These should be adapted depending on the target-group’s composition, the status of the ESD, the nature of the field (urban or rural), etc.

The more the learners themselves are involved in the planning, the greater their interest and commitment to the program. For this reason, it is highly recommended to design and implement pre-visit activities: For example learners may collect information for the site (what type of designated area it is), study maps, watch a documentary on the area, study a threatened species of the area, practice the skills acquired for the field visit (e.g. using a hygrometer), etc.

Ideally, the ESD/SDG's educator should meet with the learners before their visit to discuss the field activities. During this session, the educator informs them on the personal items to bring in their backpacks (e.g. appropriate clothing, sun block, snack, water, etc.), the materials needed for the field activities (e.g. lenses, worksheets etc.), the particularities or dangers of the area (e.g. difficult access, slippery footpaths, etc.), as well as the code of behavior of the visitor.

At this stage, the ESD educator also prepares the worksheets. In case the visit is part of a school's wider ESD program, it is likely that the learners have already formed specific questions they wish to explore in the field, and these must definitely be included in the worksheets. Although there is no rule on the size of the worksheet, it should be brief and concise as its size may deter learners. Learners' behavior in the field must also be discussed in advance. The discussion may begin by writing the following on the blackboard: "We leave nothing but footprints, we take nothing but memories." Generally, a field visit with the students is a good opportunity to cultivate environmental awareness and sensitivity. For example, when the activity includes sampling, learners must be aware of the consequences of their actions ("What happens if I remove a rare species or step on it?"). Of course, the code of behavior changes from place to place; different behaviors are expected in an archaeological site, in forest or in a factory. In any case, agreeing on behavior rules by using a contract strengthens the learners' sense of responsibility.

WORKING IN GROUPS

Working in groups encourages learners to communicate, participate and learn to share and cooperate. Through teamwork, learners regenerate their own ideas in an ongoing dialogue by sharing opinions and reactions with others.





Through this process they can usually develop choices that may not have otherwise arisen had it been through individual efforts. In teams, learning activities, making contact and ultimately taking action are interrelated in a natural way.

Group work also develops in negotiation and decision making techniques and strengthens the members' commitment to such a decision (Matsagouras, 2000). However, a team project that is not well-planned or is sporadically implemented may produce poor results. Another possible drawback is the possible low participation of some members. Those who design and implement group work activities should keep in mind the following:

- 🌱 A group functions more effectively when its parameters vary including age, gender, nationality, number and role of members, school performance (for students). There are no fixed rules as to the size of a group. This depends on the task, the objectives and nature of the field each time. Some consider four members as a happy medium (particularly for students), and advice for groups not to exceed seven members.
- 🌱 Large groups (i.e. a class of 25) are slow, with a complex system of communication and a low level of individual participation. Dynamic coordination on behalf of the instructor is necessary for successful group work.
- 🌱 As the number of members is reduced, so does the quantity and quality of ideas expressed. On the other hand, in small groups, members feel more familiar to each other and participate more.
- 🌱 For some educational activities it is a good idea to interchange between work in small and large groups (i.e. plenary for a class of 25 students), so as to get the advantages of both processes.
- 🌱 The members of a newly formed group need time and energy to familiarize with each other, to understand their given task as a group, and to develop proper cooperation mechanisms. The designer needs to include such familiarization introductory activities.
- 🌱 In teams usually one member tends to take on a leadership role making the others less active. This is not necessarily negative as that particular member develops leadership capabilities. Nevertheless, the educator should try to maintain a balance by delegating duties to everyone in the group, avoiding, however, confrontation with the "leader".

- 🌱 By pre-arranging the group composition the educator can encounter also the natural tendency of most people to group only with those most familiar to them. Different roles can be assigned to members, such as the recorders, the reporters, the timekeepers etc. These roles should be redistributed, especially during lengthy programs.
- 🌱 The project objectives and the members' responsibilities should be clear at the onset both on an individual and group level. The more team members take part in setting the objectives and rules of communication, the more committed they are to them
- 🌱 It is important for the educator to identify ways to maximize participation, taking advantage of each member's abilities. It should be recognized that everyone does not contribute in the same manner.
- 🌱 Depending on the learning goals, it may be necessary to hold frequent inter-group meetings, where they inform each other on the ways they are approaching the objectives, the challenges they are facing, their working relationships, etc. Naturally, an environment of cooperation should be cultivated to avoid a sense of competition among the teams.
- 🌱 Given that group skills are developed progressively, instructors should be patient and create an environment conducive to improving team work.
- 🌱 In an environment of trust, group members are encouraged to express ideas, disagreements, feelings and questions and to make an effort to understand the views of others. In this context, conflict is a normal and expected part of the interaction and should be seen as an opportunity for creativity and for improvement.
- 🌱 In cases of intense conflict between group members the educator should remind of the contract, and the commonly agreed rules of behavior.
- 🌱 Generally, the functioning of a group should be examined and evaluated on two distinct, yet equally important, levels, the level of task completed and the communication level.





ROUND TABLE DISCUSSION

Each member has a brief time period (e.g. 1 minute) to express himself on a subject. This is usually done at the beginning of an activity related with ESD/SDG's to encourage discussion and again at the end as a form of evaluation. Discussion can be sequential by moving in one direction but it is far more interesting for the first speaker to choose the next speaker at random and so on. A ball or doll can be used by tossing it from one person to another (with the understanding that no one can speak twice in a row).

SIMULTANEOUS DISCUSSIONS IN PAIRS

Usually applied in large group, members discuss with their partner and come to their own understanding of the subject. This method helps learners to express any difficulties they may be facing but do not wish to share with the entire group. It may also serve as an ice-breaker with each pair introducing his partner to the group.

DISCUSSION IN PROGRESSIVELY LARGER GROUPS

Discussion in pairs easily widens by doubling progressively so that group interaction develops. The complexity of the tasks/questions should gradually increase in order to avoid repetition, fatigue or boredom. It ends in a circle with all the participants.

CIRCLE WITHIN A CIRCLE

This arrangement can be compared to a fishbowl, and is better to be undertaken in the absence of the teacher. The work of the two circles is different: The outer circle observes the inner group who are aware of being observed. The inner group conducts a cognitive activity (e.g. discusses a task to reach a proposal), while the outer group remain silent and keep notes on the inners' communication process (how arguments are raised, if someone develops leadership in the absence of the instructor, if discussion rules are followed, if someone is reluctant to speak out, how is the atmosphere of the conversation –warm, hostile, scientific etc.). At the end in plenary, together with the educator the outer group gives feedback.

CONFLICT MANAGEMENT WITHIN GROUPS

Conflict is inevitable in groups and the way it is managed can have strong effects on group dynamics. Colloquially, conflict within a group occurs when two or more members try to occupy the same “space” at the same time. This space could be physical, i.e. the last empty seat in a classroom, or even psychological, where there are incompatibilities between members i.e. who will be the leader, which action strategy to adopt to solve a problem, etc. Conflict is not necessarily destructive: if managed properly it can be beneficial. In this respect, it is important for a group facilitator to understand it and be able to manage it constructively.

SOURCES OF CONFLICT

There are various classifications of the sources and the types of conflict in teamwork that are beyond the purpose of the current publication. The conflicts that an SDG’s/ ESD educator may encounter may stem from:

- 🌱 *communication* barriers as a result of poor listening, age-gap, insufficient sharing of information, lack of clarity in goals and objectives, non-verbal cues that are ignored, lack of interest of some members, different communication styles of members etc.
- 🌱 *structural disagreements* that include the members’ roles and responsibilities, interdependency, level of participation, time management,
- 🌱 *personality* factors such as ego, self-esteem, personal value system and goals, and also how open, rigid or imposing the members may be.

On top of that, in multi-ethnic teams cross cultural conflict may rise, as a result of different race, ethnic group, religion, language, and the whole aspect of values, norms, social structures and stereotypes embedded in each culture (Ford, 2001). Certainly, an SDG’s/ESD educator is not expected to be able to solve efficiently any type of conflict, also because many are unpredictable. However, some of the abovementioned sources can be anticipated and impeded in the planning phase. For example, negotiating the contract allows that a certain communication “code” is followed, and stating clearly team goals and objectives right from the start, safeguards from eventual misunderstandings and communication barriers.





HOW TO ADDRESS CONFLICT

Developing preventive strategies is a useful tool for the SDG's/ESD educator. Especially in cases when members do not know each other, designed team building activities, make them feel comfortable and start to trust each other. Accepting the difference of others is an important aspect that should be stressed. Sometimes, it is appropriate to discuss in advance how the group will address conflict if it happens; clarifying that it is a natural occurrence within teamwork. For lengthy programs, regular team review sessions give members the opportunity to report of any communication problems, and address these directly.

When conflict arises addressing it directly is usually the best option. This task cannot be left to the educator, solely. As team members all engage in the process of resolution, they build important communication skills.

Of course, willingness by all parties to resolve conflict is a basic prerequisite, and SDG's/ESD educators should keep in mind that this is not always the case. Based on existing literature (Mitchell & Mitchell, 1984; Phillips, 1997; Ford, 2001; Townsley, 2005; Global Knowledge, 2006) are some suggestions to resolve conflict constructively:

- 🌱 Bring the conflict in plenary. Discussing the issue that caused tension outside the group undermines trust and causes frustration to all.
- 🌱 Put the conflict in perspective of the group goals: how serious the conflict depends on how much it threatens the goals' accomplishment.
- 🌱 Attack the issue, not each other and try not to take things personally. Being judgmental to people and their values is a destructive form of conflict.
- 🌱 Concentrate on substantial facts, not hereby opinions. For example, use the phrase "Tom is often late at meetings" rather than "Tom is uninterested in our meetings."
- 🌱 Acknowledge the others' position: one doesn't have to agree but should listen. Do not hesitate to ask questions to clarify aspects that you are not sure you understand.
- 🌱 Seek to understand all angles of disagreement: individuals have unique frames of reference and they conceptualize the same situation (conflict) differently.

- 🌱 Use direct confrontation (instead of indirect). For example, replace the phrase “People are not being honest about what is really bothering them” with “Sue, tell us what is...”
- 🌱 Confront the conflicting party in a structured way: for example, “Tom (direct confront), when you are late for meetings (behavior) it makes me angry (emotion), because your tardiness wastes everyone’s time and the team is left behind in its tasks (reason for the emotion). What do you think?” (Wait for the response that should be also structured and not defensive). These types of rational statements defuse anger.
- 🌱 Redefine the problem statement if other root causes or symptoms unveil with discussion. For example, some members may not do their assigned tasks not due to lack of motivation, but because they do not understand what is expected from them.
- 🌱 Continuously check the basis of your own perceptions. Several times our actions and beliefs are based on stereotypes. And sometimes even the person that caused the conflict does not acknowledge why he/she caused it.
- 🌱 Put emphasis on areas of agreement, rather than disagreement.
- 🌱 The team should not exhaust in an ever-ending analysis: once the reasons of conflict are discussed, members should generate solution options.
- 🌱 Some people always thrive on conflict and seem to enjoy it, possibly seeking to establish identity or power, or even because it is the only thing that energizes them. These usually lack group commitment and intention to change. Open constructive confrontation by all members may be necessary to help these people take responsibility for themselves and make effort to even consider change.
- 🌱 Conflicts with the group leader or the educator should be anticipated. The leader should be ready to accept negative criticism and be willing to learn from it, avoiding the trap to quit from his/her leadership responsibilities.
- 🌱 Sometimes, particularly in cases of tense emotions or unpopular decisions, an authoritarian approach by the educator can be used. Other times avoiding or postponing the issue is more appropriate, especially when the conflict is of low importance or when time alone is expected to bring about a resolution. In any case, the educator should explain the reasons for his/her action –or non-action- calmly and directly.





- ESD educators know that a team has a great advantage over individual work, in terms of resources, knowledge and ideas. This diversity also produces conflict. However, if properly managed, conflict can become a source of innovation and a deep learning experience to all.

USING THE CULTURAL DIVERSITY AS A POSITIVE ELEMENT FOR IMPLEMENTING THE SDG'S

The cultural and religious confrontation is one of the challenges of our time and such confrontation often appears within classes in modern metropolitan cities. ESD can and should address this complex challenge, as confrontation provides a unique opportunity to get rid of stereotypes, xenophobia, and mutual negative representations. A corner stone of intercultural education is identifying what people have in common, in an open and inclusive dialogue. Suggested SDG's/ESD themes that can be used to unveil and reflect on the differences and similarities include i.e. clothing, family, diet, languages, art and religion.

SDG's/ESD educators should not forget that by learning about and respecting other cultures and religions we can all learn and fully understand the principles of our own culture and religion.

BRAINSTORMING AND MAKING CHARTS

Brainstorming is a technique used to explore spontaneous ideas generated by a group on any given subject in a short time. The subject can be either a question or a position clearly stated by the educator. Learners are asked, within a few minutes, to spontaneously express whatever comes in mind about the topic, using short phrases or key words. Alternatively, they can write them on cards. All the words and phrases are written on the board by the educator or a group member appointed as the 'recorder'.

Some examples for brainstorm: What do you assume are the causes of pollution in the lake? What could the local community do to take advantage of the marsh? How is deciding to protect an area similar to putting a treasured ring in a safe or your favorite cards in plastic sheets? (for primary level).

During the process, the educator:

- 🌱 Encourages all participants to express their ideas and opinions. He/she stays alert to make sure to include an idea expressed in hesitation by a shy learner.
- 🌱 Stresses that there are no right or wrong answers, and there is no “silly” reply as well. That is why there should be no criticism from the group on the ideas heard.
- 🌱 Notes down all the ideas heard without comments. However, when an idea is vague, he asks for clarifications before noting down the key-word, to avoid misunderstandings.

Brainstorming is neither time - nor material – consuming and can be conducted anywhere. It is appropriate for the detection of knowledge as well as attitudes regardless of the age of participants. The best results are obtained when participants have varying background and personality traits and when they have a general idea about the issue, without knowing it in detail. Within an educational program a brainstorm can be applied at various stages so as to generate fresh ideas, to enliven an activity, to evaluate a process, etc.

There are some limitations to the method such as: sometimes totally inconsistent ideas are generated if the participants have none whatsoever idea on the subject; at times the process may lead to ‘chaos’ that is why it requires good facilitation skills; and in some cases, ideas may be too vague because of lack of analysis.

WEB CHARTS

Key words or ideas generated during a brainstorming session or from a general discussion can be used in an organized way through what is known as a “thematic network”, “web chart” or simply a “web”. It is a chart with the main idea in the middle and all related satellite concepts diverging from this central point. A web chart is considered as a flexible form of concept map usually it does not include connector words between satellites, nor does it have a strict hierarchical structure, thus it does not reflect the relationship between concepts. It is mostly a diagram that can be used in order to schematically highlight the number of interconnections and the complexity of issues. It is a tool appropriate even for very young children where words can be replaced by images and shapes.





There are many ways to practice making web charts. One way is to give learners a partially finished web showing only the central idea and one or two satellites and have them complete it either individually or in small groups.

Another way for those who are familiar with the method is to hand out the satellites only (as cards) and ask learners to suggest a logical web or, even, discover the central concept. For example, what would be the central concept of a web chart with the following satellites: production activities, carrying capacity, natural resources, conservation of habitats, science and research, monitoring, guarding, interpretation projects, monitoring systems, volunteerism, communication, monuments infrastructures.

A web chart can be applied also as an informal evaluation tool. Used at the beginning of a program, it helps learners visualize existing views and preconceptions. Applied at the end, it is expected that it will generate more satellites and connections.

CONCEPT MAPS

Concept maps are used to investigate and highlight the relationships between concepts. They are based on the theory of constructivism according to which it is the learner himself who creates knowledge. The mapping process refers to abstract mental forms developed in order to “give shape” to a newly perceived concept (or object), to give meaning to it and to include it to one’s existing conceptual framework. Concept maps constitute the graphic representations of such abstract forms.

However, even before the formation of concepts and the creation of concept maps, the human mind firstly “shapes” a “scheme” by experiencing, conceiving and perceiving images of the visible world and the relationships among these, a process known as perceptual mapping.

Concept mapping promotes meta-cognition, which is the understanding of the very nature and process of human learning. It familiarizes learners with the very same “tools” of their own thinking process. In other words, they comprehend the way of their thinking, they learn how to learn, a fact that contributes in the essential learning, critical thinking and acting.

The mapping process is reflected in the “concept map”, a schematic diagram which determines the relations between concepts related to a subject. In other words, a concept map constitutes an “impression” of the concepts conceived, processed and developed by the individual and at the same time, it facilitates the comprehension process, in a relatively short period of time.

Concept maps are used in ESD as a tool to explore learner’s initial perceptions (pre-conceptions) and to present the results of qualitative research on interest and awareness of the environment. Its implementation can be combined with other methods particularly at the onset of activities when learners are exploring ideas on a given subject. At the end of a program it can be used for reflection and evaluation.

As in the case of web charts, participants may be asked to complete partially constructed maps for practice. Beginners’ maps may not be as satisfactory because they tend to connect most concepts using a linear sequence or they will group concepts to one side of the map. Generally, a satisfactory number of concepts in a map are between 7 and 10. Maps are also a useful tool to help identify learner misconceptions; this can be seen either through an inappropriate connection between concepts leading to a false statement or through a statement where the basic idea connecting two concepts is missing or through an illogical connection between concepts.

Generally speaking, the positioning of concepts and the connections between them that lead to a logical statement, or in other words, connecting parts of the map using different groups of concepts, is what constitutes the criteria of successful map construction. Comparing the maps of different groups allows participants see that common stimuli and objectives can produce differently shaped maps. Through the exchange of ideas, they may decide on a final, common map. Preparing presentations and discussing the maps helps teams cultivate meta-knowledge skills as well as the ability to process and use their own ideas; they announce them, they are conscience of them, they accept or reform them, they embrace or borrow ideas from others and they incorporate them in their own knowledge and semantic context.





SIMULATION AND DRAMATIZATION

Simulation and dramatization exercises in general provide excellent strategies for promoting the understanding of the options which have to be considered in taking a decision on any issue, environmental or other. The qualitative, quantitative parameters come into play present, past, and future, thus reinforcing the idea of humans as part of the environment. Such experiences may function as a stimulus for more traditional teaching and learning methods, such as writing and discussion. Ideally, players should not engage in such exercises unless they have been adequately prepared in terms of content and process. To this end, scientific information, articles, etc. on the main theme may be studied in advance.

On the other hand, these are improvisational techniques, requiring a feeling of safety and trust. This is particularly important for inexperienced players or in cases when they are not familiar with each other. The sense of safety may be cultivated by appropriate warm up and trust building exercises. All players should be empowered to enjoy such primal vehicles of self-discovery and self-expression without being concerned whether they are 'good enough' and without being judgmental to the players.

ROLE PLAYING, PANEL DISCUSSIONS AND DEBATES

Role-plays, panel discussions and debates are simulation methods that allow learners to 'get inside' and 'experience' an issue through the viewpoints of the relevant stakeholders (players). The participants portray certain well-defined characters (e.g. local authority officers, farmers, ecologists, consumers, etc.) in the context of a given situation with conflicting interests, seeking a resolution.

The preparation phase is rather important for an effective role play. Players prepare by reading articles, studies, by interviewing experts etc. on the main theme. Group discussions will point to the social groups affected by it (players). This will help them to start forming arguments for each player, a process that, in practice, may prove rather difficult. The SDG's/ESD educator has a key role in preparing the scenario and the characters description during this phase, ensuring that all contradicting interests are represented. To perform the actual role-playing the roles are assigned by the educator or by chance, to individuals or groups of individuals.

In many cases the discussion outcomes are 'leaning' towards the 'stronger' negotiators that is why it is essential to have balanced representation in all groups. Some time is given to groups to prepare convincing and valid arguments and then the players perform in role (usually one person from each group). Panel discussions begin with a first round of presentations of positions, followed by a second round of comments and a discussion with the audience. A moderator ensures equal time to speakers and keeps the discussion 'on track'. Because this role demands advanced facilitation skills, it is usually undertaken by the educator.

Throughout these exercises it is important to seek consensus and compromise instead of engaging in exhausting confrontation. Learners will, therefore, realize that only through cooperation of social groups will they reach a commonly accepted solution. Following the simulation, a debrief activity that relieves the congestion and smoothly moves the players 'out of role' is necessary.

This can take the form of discussion, writing (e.g. a letter to the mayor), drawing (e.g. how the negotiated area will look like 10 yrs later), etc.; however always in relevance to the activity's set objectives.

The overall process helps in developing skills related to i.e. thought organization; precise presentation; main points' extraction; distinguishing relevant from irrelevant; identifying ambiguous claims etc. but also to identifying others' underlying values and attitudes, detecting bias and naturally conflict resolution. In cases of young children, the characters portrayed could be organisms of the food chain, legendary and mythical creatures, etc; however, this process can be considered more of a drama than a role play.

MAKING A VIDEO

This technique is quite simple and can be adjusted to many contexts. The process followed is the following: While in the field the learners collect materials for their videos (scenery). Back in class, guided by the educator, they brainstorm on a common issue; they create the scenario; they set up their scenery (using their collected materials); and they develop the main characters. Then they take photos of the subsequent scenes and using the laptop/PC, they collate them to create a video animation telling their story. They record their voices as sound.





DRAMATISATION

While a typical role play or debate is based on the ability to apply logical thinking, form arguments, etc. a typical drama is emphasizing more on the feelings of the actors; that is why it is particularly appropriate for younger ages.

PROBLEM BASED LEARNING

Problem based learning (PBL) is a student-centered educational problem-solving method. problem solving has its roots in the 1970's when environmental awareness was closely linked to building public awareness on intense environmental problems that eventually led to ecological crises including pollution, depletion of natural resources, desertification etc. Later, in the 1980s,




Environmental Education was oriented towards looking at the basic causes of the ecological crisis which included overpopulation, excessive consumerism, faulty economic and development indicators and the lack of proper education. The importance given to finding solutions was reflected in the field of education by focusing on the teaching and learning process of problem solving. PBL also has its roots in the field of educational science.

John Dewey envisioned the school as a miniature democratic society and placed the educational foundations of direct experience, participation and action. Participation of individuals in resolving problems demands a shift from teacher-centered to experiential, participatory student-centered approaches.

Every change in the environment does not necessarily mean an environmental problem. A change in the environment can be positive, negative or neutral and can be due to natural causes or human influences. An environmental problem is a change that threatens the environment. Or there is evidence indicating that it may threaten the environment now or in the near future including the quality and well-being of the environment and man. A critical question on whether a change is positive or negative is "for whom" as well as "when" (e.g. today, ten years from now, etc.)

In using PBL learners acquire lifelong learning skills such as the ability to find and use appropriate learning resources. Additionally, research shows that this method develops four skill categories (UNESCO, 2002):

- 🌱 Group working: Listening and understanding others' ideas, expressing their own ideas, exchanging ideas, making decisions, using their time wisely, etc.

-  Data collecting: Using reference materials, designing and implementing ways of finding information on their topic (surveys, polls, experiments, research etc.) writing and sending letters requesting information, etc.
-  Decision making: Analyzing information collected, clarifying their values and those of others, identifying alternate choices/approaches of an issue, deciding on action and supporting their decisions, etc.
-  Action evaluating: Deciding on the steps of an action plan, choosing freely to take action, evaluating whether any changes are the result of their actions, addressing problems.

Some academic theorists and educators have expressed misgivings on the method of PBL, with particular criticism on the student's involvement in such practices claiming that this goes beyond the learner's and educator's ability (Papadimitriou, 2002). However, the pedagogical value of PBL lies primarily in its methodology and not in the actual solving of a problem. For example, a group of students studying atmospheric pollution in a given area, it is not expected that they actually solve the problem. Of course, the approach to the problem should be based on correct data and proposed solutions should be realistic, PBL is characterized as the "umbrella method" as well because it incorporates a variety of techniques and activities, e.g. team work, discussion, field activities, research and polls, etc.

Many different methodologies have been developed for PBL in the EE/ESD context, the main one emphasizing to action. An example of PBL based on the method's general context follows. Of course, it is not obligatory to strictly follow the steps, for example, if a group of students has already implemented a similar program in the past, the SDG's/ESD educator can skip i.e. the analytical evaluation step. In addition, it is reasonable to expect that the suggested work plan can be covered in an ESD program that includes several meetings between the educator and the team of participants. However, PBL can be implemented in a shorter time period e.g. in a two-hour meeting.

For example, a team can work on an issue using information based on a current newspaper article which has been evaluated by the educator. Of course, the steps below can be followed in this case as well: investigating and analyzing causes of the problem, identifying and evaluating possible solutions etc. and not be oversimplified or frivolous



QUIZ I

1. Choose the correct statement

- A. The four pillars of education: Learning to learn, Learning to be, Learning to live together, Learning to do;
- B. The four pillars of education: Learning to realize, Learning to be, Learning to live together, Learning to do;
- C. The four pillars of education: Learning to learn, Learning to go, Learning to live together, Learning to do;
- D. The four pillars of education: Learning to learn, Learning to be, Learning to change, Learning to do.

2. To apply successfully ESD we must incorporate functionally and constructively the dimensions of environmental, cultural, economic, technological and political issues and their interdependence in the modern world. One word is missing in the sentence. Choose the correct one:

- A. International
- B. Social
- C. Educational
- D. Citizenship

3. Reviewing the educational objectives from Tbilisi onwards, some of the following categories of aims can be reported for ESD. Which statement is not related with the educational objectives?

- A. Learning to know
- B. Skills/Competences
- C. Information, knowledge and awareness
- D. Learning to live apart

4. A dynamic initiative was undertaken by the 56 member-nations of the UN Economic and Social Commission for Europe (UNECE). The member countries adopted in Vilnius (2005) a document that is considered a flexible framework text to be adapted by countries according to particular problems, conditions and priorities. What is it called?

- A. DeSeCo study
- B. UNECE Strategy for ESD
- C. National Implementation Plans
- D. Set of competences for ESD

5. **Choose the incorrect statement: ESD competencies can be classified as:**
- A. methodological competencies – skills, fact-finding, analysis, problem-solving
 - B. social competencies – communicating, working interactively, citizenship
 - C. financial competencies – knowledge, facts, definitions, concepts, systems
 - D. personal competencies – attitudes, values, ethics
6. **Select the teaching element that does NOT apply to the successful implementation of SDG's through ESD:**
- A. Non interdisciplinary concepts
 - B. Courses
 - C. Practices
 - D. Measurement
7. **Which of the following principles is not translated into an educational goal related with ESD.**
- A. Special attention should be paid to understanding the complex relations between socio-economic development and the improvement of the environment.
 - B. A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.
 - C. A further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions. Environment should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions.
 - D. Think locally, Act locally.





8. **Complete the sentence with the correct statement: A basic premise of education for sustainability is that just as there is a wholeness and interdependence to life in all its forms.**
- A. so must there be a unity and wholeness to efforts to understand it and ensure its continuation.
 - B. so must understand it without its continuation.
 - C. without efforts to understand it and ensure its continuation.
 - D. so must there be a unity and wholeness to efforts to understand it and ensure its stagnation.
9. **Evaluation of implementation of SDG's in teaching process is based on.... Choose the incorrect option:**
- A. what we know
 - B. what we write
 - C. what we want to know
 - D. what we have learned
10. **Complete the sentence with the correct statement. An educator should practice ways of communicating symmetrically and complimentary and find ways to interact with different social groups:**
- A. communication strategies such as conflict management and facilitating decision making.
 - B. communication strategies such as negotiation.
 - C. communication strategies such as negotiation, conflict management, facilitating decision making, are crucial.
 - D. communication strategies such as negotiation and facilitating decision making.

QUIZ II

1. **Complete the sentence with the correct statement: Discussion in pairs easily widens by doubling progressively so that group interaction develops. The complexity of the tasks/questions should gradually increase in order to avoid repetition, fatigue or boredom.**
 - A. It ends in a circle with all the participants.
 - B. It ends in a circle with half participants.
 - C. It ends in a circle with the last participant.
 - D. It ends in a circle with all first participant.
2. **A group functions more effectively when its parameters vary including age, gender, nationality, number and role of members, school performance (for students). There are no fixed rules as to the size of a group. This depends on the task, the objectives and nature of the field each time. Some consider _____ members as a happy medium (particularly for students), and advice for groups not to exceed seven members. How many members is the correct answer?**
 - A. 5
 - B. 3
 - C. 4
 - D. 6
3. **Round table is one of the ESD methods. What is the time that each member has to express himself on a subject?**
 - A. 2 minutes
 - B. 1 minute
 - C. 40 seconds
 - D. 30 seconds
4. **Choose the incorrect statement: The conflicts that an SDG's/ ESD educator may encounter may stem from:**
 - A. communication barriers
 - B. structural disagreements,
 - C. personality factors.
 - D. financial issues





5. Choose the correct statement:

- A. Suggested SDG's/ESD themes that can be used to unveil and reflect on the differences and similarities include i.e. clothing, family, diet, languages, and biodiversity.
- B. Suggested SDG's/ESD themes that can be used to unveil and reflect on the differences and similarities include i.e. money, languages, art and religion
- C. Suggested SDG's/ESD themes that can be used to unveil and reflect on the differences and similarities include i.e. clothing, family, diet, languages, art and religion, endangered species.
- D. Suggested SDG's/ESD themes that can be used to unveil and reflect on the differences and similarities include i.e. clothing, family, diet, languages, art and religion

6. Complete the sentence: _____ is a student-centered educational problem-solving method. Problem solving has its roots in the 1970's when environmental awareness was closely linked to building public awareness on intense environmental problems that eventually led to ecological crises including pollution, depletion of natural resources, desertification etc

- A. Conflict based learning
- B. Cognitive learning
- C. Problem based learning
- D. Critical learning

7. In using PBL learners acquire lifelong learning skills such as the ability to find and use appropriate learning resources. Additionally, research shows that this method develops four skill categories. Which of the following is NOT one of these categories?

- A. Individual working
- B. Data collecting
- C. Decision making
- D. Action evaluating

8. Complete the sentence with the correct statement: Concept maps are used in ESD as a tool to explore learners' initial perceptions (pre-conceptions) and to present the results of qualitative research on interest and awareness of the environment. At the end of a program it can be used for:
- A. group work
 - B. reflection and evaluation
 - C. role play
 - D. dramatization
9. Complete the sentence with the correct statement: A web chart is considered as a flexible form of concept map usually it does not include connector words between satellites, nor does it have a strict hierarchical structure, thus it does not reflect the relationship between concepts. It is mostly a:
- A. Diagram
 - B. Graph
 - C. Crosswords
 - D. Triangle
10. Which of following statements does not apply to pedagogical methods and tools applied in ESD?
- A. Concept map
 - B. PBL
 - C. Counting
 - D. Web charts

It's not enough to have a strategy,
if you are not too good at applying it
and implementing a solution in
taking actions



MODULE 3 - TEACHERS GREENING IN VET TOOLKIT

When we think about the pace of change over the last ten to twenty years, we know that the 21st century will be very different from the past. Yet, surprisingly, the future is often a neglected concern in education. Why is this case, when we know that:

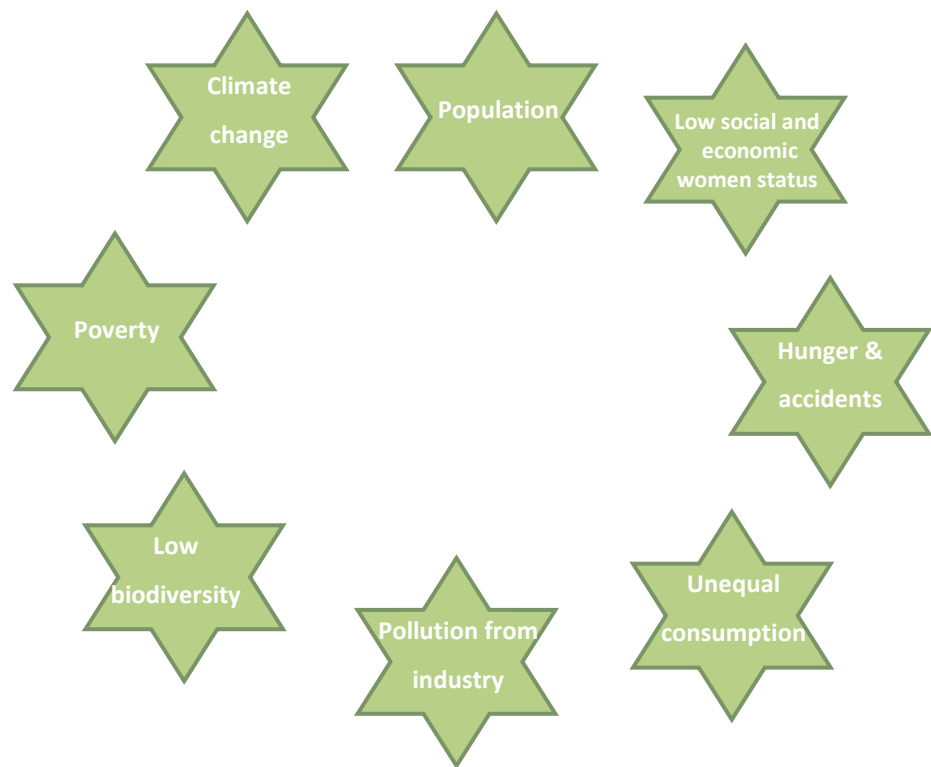
- Young people are concerned about global issues but also often feel unprepared for what the future might bring; and
- Most of what goes on in education draws on the past, is enacted in the present, but is intended for some future use?

If it is true that all education is for the future then the future needs to become a more explicit element in all levels of education. However, in a world where change seems increasingly rapid, whether at local, national or global levels, it is important to ask questions about the future.

- Where are we going and where do we want to go?
- What are my hopes and dreams for future, for myself, for others and for the planet?
- What can we do together now in order to help create a more just and sustainable future?

Answers to questions such as these provide reasons for integrating a futures perspective into education.

NINE MAJOR GLOBAL ISSUES



The following tasks provide an opportunity for you to explore the connections between many of the major social, economic and environmental problems facing people in the world today. Some of these global realities are shown in this diagram.

Please print a copy of the diagram as you will be using pencil and paper for this activity.

- Print the diagram
- The diagram identifies nine major global issues. On your print-out, draw a line between any two issues that you think are related
- Describe why you think these two issues are related. Can you give an example of how?
- Now, starting from the second issue you identified, draw a line to another issue that you think it is related to. Once again, describe an example of how or why you think the two issues are related
- Starting from the third issue, draw a line to another issue that you think is related to it. Once again, give an example of how or why you think the two are related
- Keep making these links, and giving examples, until you have exhausted all possible connections between the issues

Q1: Analyze the pattern of links you have made by answering the following questions:

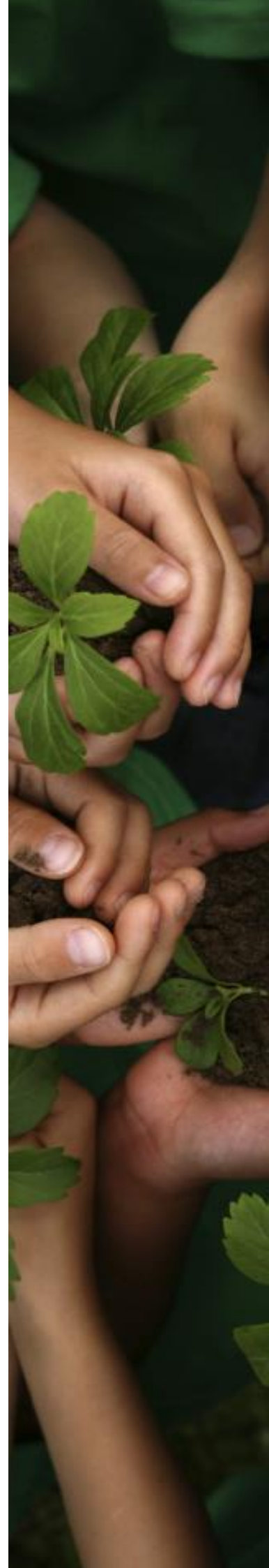
- 🌱 How many links did you make?
- 🌱 Do you believe that any of the links are more important than others? Which ones? Why?
- 🌱 How do links such as these affect the way in which social, economic and environmental problems need to be tackled?
- 🌱 What is the key lesson that you have learnt from this exercise?

GLOBAL FUTURES TIMELINE

This activity enables you to think about how these trends will affect the future under the heading of 'My Life in the World: The World in My Life'. However, instead of predicting only one future, the activity asks you to predict what you would like to happen (your 'Preferable Future') as well as what you think is most likely to happen (your 'Probable Future').



- 🌱 Print diagram.
- 🌱 On the left-hand side of the timeline on the printout, mark 3-5 important past events and current trends that have affected, are affecting and/or will affect you and world society.
- 🌱 On the 'Probable Futures' line, mark 3-5 events and trends that you expect to occur within the next hundred years.
- 🌱 On the 'Preferable Futures' line, mark 3-5 events and trends that you would really like to see happen within the next hundred years.





Q1: Analyze the completed timeline by answering the following questions:

- 🌱 What are the main similarities/differences in your 'Preferable and Probable' futures?
- 🌱 Why are there these similarities?
- 🌱 Why are there these differences?

The message of sustainable development can be summarized in three themes:

- 🌱 Everything is connected to everything else
- 🌱 Human quality of life is just as important as economic development
- 🌱 There can be no long-term economic development without attention to human development and the quality of the environment

FIVE PRESSING ISSUES

When we think of environmental problems, we often think first of the pollution of the natural environment – of the air, rivers, oceans and seas – and issues of climate change, forest clearing, waste disposal and so on. However, there are also many problems with our social and economic systems that are causing difficulties for people all over the world. As a result, we are facing many pressing issues. The idea of this activity is collaboration of students around the concept of pressing global issues. The **ESD skills** that are developing are: **collaboration, creativity, curation, data, critical thinking, empathy, global stewardship and presentation of ideas**. The **goal** of activity is: **students will use research skills to investigate pressing local and global issues**.

PROCESS

- 🌱 Students will collectively investigate global issues and determine at least five qualifying as the 5 Most Pressing Problems on the Planet. Each class will use this Google Form to post their results which can be viewed on a live Google Map.
- 🌱 A blog will be created reflecting the most common choices. A separate page will be designed for each issue. Students from each participating school/class will be encouraged to post on the pages of interest to them, further developing and challenging their understanding of these local and global concerns. Students will be encouraged to interact with peers (Skype, Google Hangout, email) from other countries/classes to gain a global perspective on their pressing problem.

🌱 While researching, blogging and discussing each problem, students will consider:

- why this problem is so urgent?
- what is currently being done about this issue?
- what should be done. ideally?
- which subfields are involved (environmental, political, historical, economic, etc.)?

Students will narrow their focus to one main issue and discuss how that issue is prevalent locally vs. globally (a country to country comparison)

Students will create a digital presentation (3-5 minutes in length). Presentations will be posted on the blog site. Students will then have an opportunity to provide feedback and reflection on the varying issues.

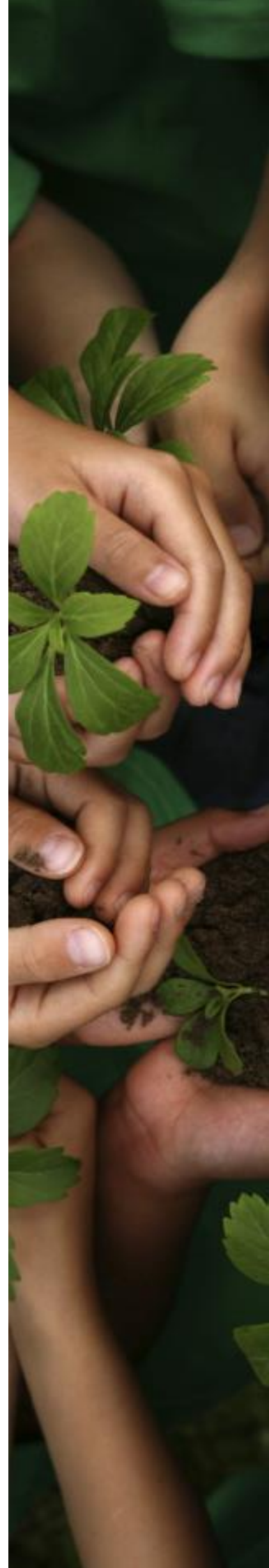
MY CHOICE

The learners rank elements of their direct environment, firstly for themselves and then placing themselves in the position of other people or living organisms.

1. We hand out a list to the learners, explaining that the list contains elements of the area they live in.

- 🌱 a big house - a forest - a wildlife park
- 🌱 the national road - a swamp - a tree farm
- 🌱 a shopping mall - a river - farmland
- 🌱 wild animals - endemic plants - grasslands
- 🌱 a school - a hotel - a listed building (i.e. windmill)

2. **Round A:** We ask learners to rank individually the elements judging from what is more important for themselves and their life. In groups of 2-3 they compare and discuss each one's ranking.





3. **Round B:** We give out roles to everyone, i.e., a farmer, a tourist-guide, estate agent, a botanist, etc. They repeat the procedure, this time in their varying roles. After individual ranking, they discuss their choices in groups.
4. **Round C:** Everyone chooses a favorite animal or plant that lives in the area. They repeat the ranking, this time in the name of this animal or plant. Again, in groups they discuss their choices.
5. **In plenum,** the learners are asked to discuss the following reflection questions:
 - 🌱 Are there predominant trends for the first choice in each of the three rounds?
 - 🌱 What are the main differences of the three rounds?
 - 🌱 For which of the three rounds was the ranking more difficult and why?
 - 🌱 Did someone think of future generations while ranking the elements? Why or why not?
 - 🌱 What are the benefits and what the costs of each choice? For example, how the ranking of the swamp much below the shopping mall may eventually affect the swamp, and so on.

INVESTIGATION OF THE CONCEPT OF PROTECTION THROUGH WEB CHARTS

This learning activity aims to investigate the concept of protection and its relationship to values. It is proposed for the level of primary education:

1. After being reminded of the communication rules during brainstorming (respect of others' ideas, equal opportunities, no criticism, etc.), the learners are divided into groups of 4-5 and each group is given a large card or paper.
2. **Round A:** Given the central concept "I PROTECT" the educator asks each group member to think of something they had to protect themselves at some time and from what. This can be an object (i.e., toy, photograph, and collection), a living organism (i.e., pet, plant) or even something immaterial (i.e., the memory of the best holidays, a favorite story). Time is given to the groups for brainstorming and writing their ideas on a radar chart.
3. With a different colored marker, the educator asks them to fill in to their radar chart the cost of their choice, what they had to change or sacrifice in order to protect the above-mentioned item (i.e., to safely keep the favorite doll, means that I won't be playing with it etc.).

4. **In plenum**, the groups expose their radar charts and explain their approaches.
5. **Round B:** This time the web is constructed by the educator, using the central concept “WE PROTECT”. The educator asks learners in plenum to name material or immaterial items that people may protect collectively (i.e. the residents of a village might wish to protect an old plane, a monument, a building etc.). A discussion follows considering the criteria and distinctions between the things we protect individually or collectively.
6. **Round C:** At this level, that takes place also in plenum the central concept of brainstorming is “PROTECTED AREA”. The learners are called to think and write down reasons for which an entire area may need protection and the cost of such an option (i.e. visits may be prohibited in the core zone and so on).
7. At the end of the activity it is recommended that the educator presents some international or national criteria for establishing protected areas (i.e. Natura 2000, etc) thus allowing the learners to locate similarities and differences.

USING GAMES: ICE-BREAKERS AND GROUP BUILDERS

Within ESD interventions social learning is an important parameter. This entails learning ways to behave in society, work in groups or treat conflict. Communication activities are an important aspect of a conscious ESD intervention with groups.

An ESD educator must improve the group members’ communication skills, their ability to deal with difficult situations, to make group decisions, to create and follow rules, such as “No speaking at the same time”, “Listen to each other carefully”, “Respect different opinions even if I don’t agree”, “Negotiate with others for a common objective”, “Try to combine different opinions”, “Contribute to solving a group problem”. Essentially, a team is developed gradually within the ESD intervention, as its goal becomes clear for the team members who should all contribute to its realization, depending on their capabilities. During group building, a variety of activities can be applied to break the ice and build trust.

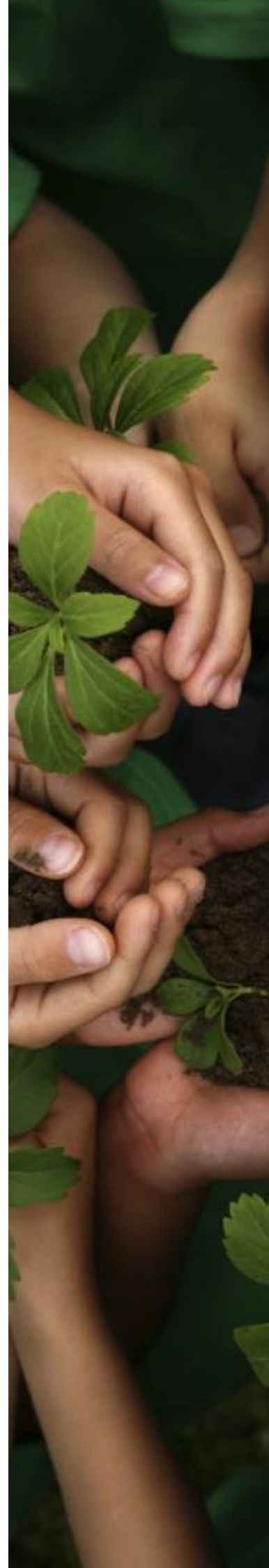




IMAGE INTERPRETATION

Three photocopies of the same image are needed, one for each group. The first photo is cut so that only a small part of the image is shown; the second shows a bit more, while the third shows the entire image. The first image is distributed and participants are asked to document their feelings or their thoughts. Then the second image is shown containing more information and participants are asked the same questions. The process is repeated with the third photo. In the end, the questions take on other dimensions and reflect a possible change in attitude or feeling, as influenced by other members of the group. Questions encourage discussion and cooperation and also help strengthen communication.

FOOD GRID

Group members hold cards showing an animate/organic or inanimate/inorganic component of an ecosystem that has been chosen randomly. The members are connected with string and each person must be familiar with the plant, animal or inanimate element on their card. A basic question is then asked, “What happens if one of the components is altered or disappears from the ecosystem”? One person is moved away from the “net” as they try to keep the string tight. As a new balance is formed, discussion follows on the concept of survival and evolution of an ecosystem but also on the role of human intervention in ecosystems’ degradation.

FOOD LEVELS

Students that have already discussed the structure of an ecosystem and know the producers, primary consumers and secondary consumers form a pyramid of food levels. The “producers” kneel on the ground, and the “primary consumers” sit on their backs and so on while the previous level is greater in number and size than the next.

SITTING ON MY NEIGHBOR’S LAP

In a tightly-formed circle, participants’ stand, shoulder to shoulder and are asked to turn left while at the same time take a step in towards the center of the circle so that it eventually becomes “compact”. Then they must grab hold of the waist of the person in front of them and then sit on the lap of the person behind them.

When the system is balanced, they are asked to raise their arms in the air. The steps are repeated with a right turn. Discussion follows on the need for mutual support and cooperation in order to achieve “difficult objectives”.

PENGUINS ON ICE DURING A PERIOD OF GLOBAL WARMING

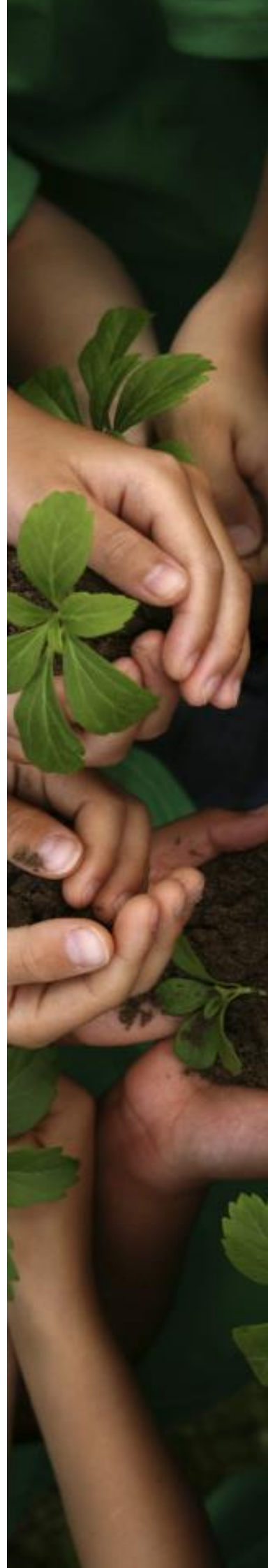
Chairs serve as pieces of ice and on each one there is a “penguin”. Because of high temperatures, the ice begins to melt. One disappears and the chair is removed, forcing the “penguin” that was using it to stand on the one next to him, using his hands to support himself on the other “penguins”. Global warming continues and there is less and less “ice”. There is a moment of chaos where one does or does not help the other to remain on the “ice”. The activity demonstrates the need for cooperation in resolving environmental problems.

OVER THE WAVES

With arms spread out that move freely from the shoulder, non-stop, up and down, the members of the group form two parallel lines facing each other, one of the teams holds a “swimmer” who must cross from one island that has been flooded due to a rise in sea levels from global warming, to another coast in order to survive. The “swimmer” falls horizontally on the arms of the two facing teams. This game requires trust, coordination, confidence and a high level of cooperation.

BRIDGE OVER A CLIFF

All the team members form a line, shoulder to shoulder. This line is an imaginary bridge, with an imaginary cliff left and right. Legs are spread apart touching the legs of the person next to them. There is, therefore, room for someone’s legs, which starts at one end of the bridge to cross to the other end. Hands may be used to support as he passes. In this way, team members are given the opportunity to meet each other, one by one, while at the same time becoming familiar with physical contact in the effort to support the person who is crossing the bridge.





BLIND MAN'S BLUFF

Group members are paired off. One person's eyes are covered while the other helps to guide them through nature or another, human environment. He must avoid obstacles, crawl under low vegetation while walking on different types of terrain. Quiet is necessary as the guide can speak quietly with his partner whose eyes are covered. This activity builds trust, listening skills, balance and many other senses.

ROPE – SHAPE PLAYING

The only thing needed is a long rope. The group gathers in a circle. Every participant holds the rope with the two hands in front of him and gets blindfolded. The educator asks the group to build a shape with the rope making a geometric figure (e.g. triangle). Rules are that the group can only communicate without seeing each other. When the group feels ready, they communicate it to the educator and make their final shape. At the end, participants see the shape they formed and reflect on the experience (feelings, ways of communication, pros and cons).

THE TELESCOPE

An activity that helps learners focus on observing details: "Using your hand, make a telescope: close one eye and try to see the details of the surrounding area with the other. Is there something you haven't seen until now?". "What is the strangest thing you see? The most beautiful? And the ugliest?"

CHIRPING

In a forest or park, learners lie on their backs holding their arms up in the air with closed fists. They close their eyes and concentrate on the sounds they hear. Each time someone hears a new chirping sound, he counts it by raising a finger: "Who then has the best hearing? Can you count to ten without hearing a chirp?" For variety, any sound can replace chirping (leaves rustling, water running, city hum, etc.).

TAXONOMY – CLASSIFICATION

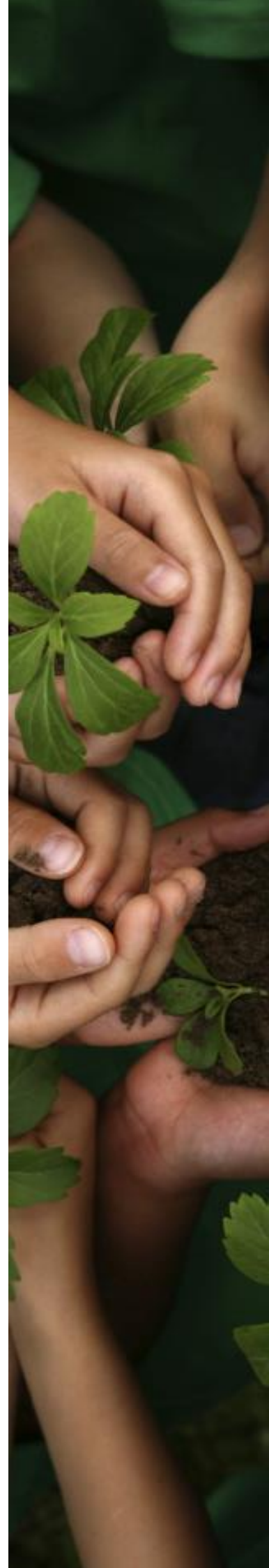
By asking questions about an object's characteristics, learners observe and discover details in their surroundings. "How many green things can you see?"... "How many metallic objects?" "How many are old?"... "How many are man-made?"... "How many are recyclable?"

CAMOUFLAGE

In a forest, 10-15 man-made items are placed along a 20-meter footpath. Some are conspicuously placed while others are hidden among foliage having the same color as the object. The number of objects is not disclosed. The learners are then asked to cross the path, one by one, keeping a distance between them (so whoever is behind cannot see what the person in front is doing). They attempt to locate (but not collect) as many items as possible. At the end of the path, they are asked to whisper how many items each saw. If no one person saw all the items, they are told that there are still more they haven't found and they return to the path. A discussion on how colors camouflage animals follows.

TREASURE HUNT

This is an activity that helps familiarize learners with the field area and its natural cycles. First, the work area is bordered off; learners are in pairs and are asked not to remove anything from the area but only to note down what they see. The activity concludes with the ESD educator asking random questions. Questions may include: Find something NEW • Find something FRAGILE • Find something OLD • Find something BURNT • Find something DEAD • Find something DEHYDRATED • Find something that is GROWING WITH DIFFICULTY • Find something that is DECOMPOSING • Find something that is INFLUENCED BY MAN • Find something that is JUST STARTING TO GROW • Find something that is AFFECTED BY ANIMALS • Find A PLACE WHERE NOTHING GROWS.





ALTERNATIVES

In order for learners to imagine alternative forms of the area, they must first observe it in a systematic and critical way: “Can you imagine what this place would be like if there was no concrete, no electricity, no aluminum, no roads, no green or no available water?”

INTERVENTIONS

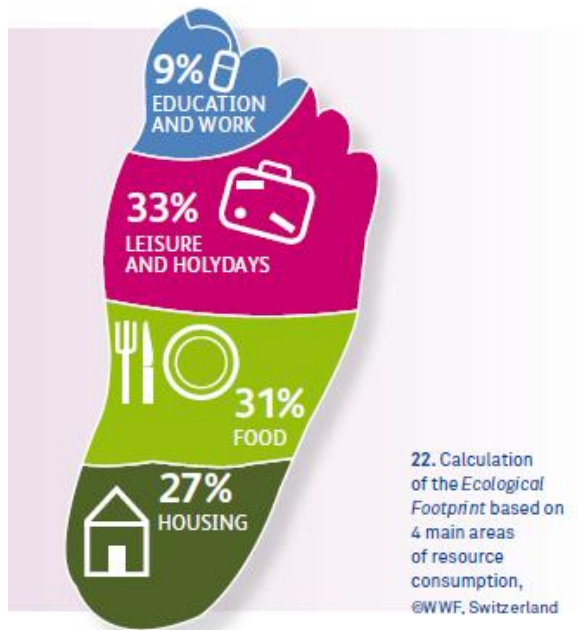
Learners are asked to mentally change something in the surroundings in order to satisfy their own needs. Encouraging observation skills, expressing needs and critical thinking are additional skills that are cultivated. “What would you add to the surroundings to make it more familiar?” ... “Is there something you would like to change in this factory, square, neighborhood, forest? Why?”

ECOLOGICAL FOOTPRINT

The Ecological Footprint (EF) is a tool to measure and assess the pressure of human activities or population on nature. It measures the amount of biologically productive land and sea area (expressed in global hectares or biologically productive hectares) a given individual, family, town, region, or human activity requires to produce the resources it consumes and to absorb the related carbon emissions. The Ecological Footprint compares this measurement to how much land and sea is available. Biologically productive land and sea includes area that is needed to support human demand for food, fiber, timber, energy and space for infrastructure and to support the management of human wastes. The use of global hectares as a measurement unit makes data and results globally comparable. In that way, the Ecological Footprint always makes the connection to a global reference system and teaches how much we consume in relationship to how much the earth can provide. It is therefore not only an important tool for environmental education; it also transmits a feeling for issues like global justice and responsibility. Conceived in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia, the Ecological Footprint is now widely adopted by scientists, businesses, governments, agencies, individuals, and institutions working to monitor ecological resource use. It is used as a policy instrument and also as an educational tool.

Learning about the Ecological Footprint and the environmental performance of the schools, calculating their impact, actually helps pupils to connect themselves directly to global SD issues as well as identify areas for action. In that perspective, the UNESCO field Office in Venice, in collaboration with the Global Footprint Network, has developed a 3-year project model in order to apply the Ecological Footprint at the school level as a tool for achieving ESD.

www.footprintnetwork.org/en/index.php/GFN



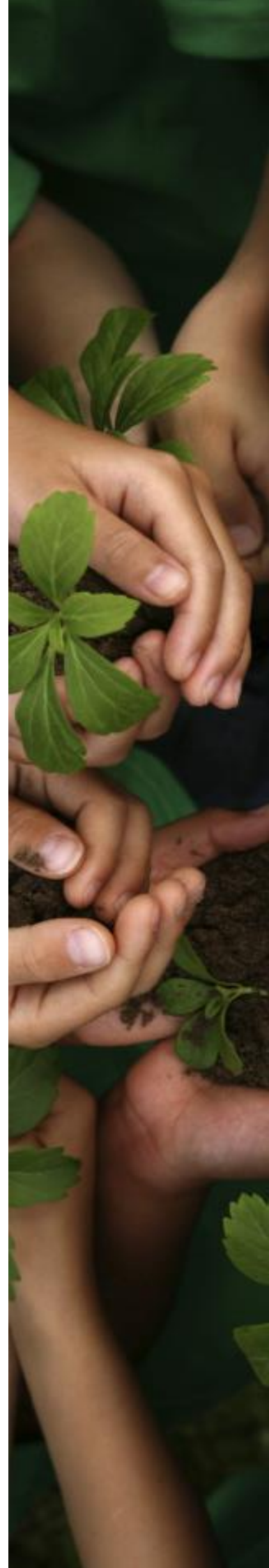
OUTDOOR ACTIVITIES (CAMPS)

Smell it! ...description and interpretation

Following a field visit, various aromatic plants are placed in separate bags. Players try to guess what is in each bag simply by smelling it. They may also be asked to give a word or metaphor for the plant as they smell it.

The “touch pool” ...description

Various objects of different material, texture and shape are placed in the same bag. Players are asked to formulate hypotheses on their raw material (organic or inorganic), origin, etc.





Draw the object ...description

Players sit in pairs, back to back. Player A decides and describes in detail an object found in the field while Player B tries to draw it without knowing what it is.

Guess the object ...observation and analysis

A player thinks of an unusual object related to the ESD/SDG's. The remaining players try to guess what the object is by asking 10 questions whose answer can be either "yes" or "no" (the number of questions may vary, depending on the object). Players draw conclusions on the importance of classification and the sequence of questions.

30 questions about an object ...observation

Players are shown an object found in the field (e.g. a piece of fishing net or a hoe) and asked to propose 30 questions about the object. This activity shows learners how much information can be gathered from a simple every day or "insignificant" object, depending on how they look at it.

The tangle ...observation

Using a series of photographs of objects found in the field, players secretly choose one and describe it in one paragraph. One by one, the paragraphs are read aloud and the remaining students try to guess which object is being described.

The museum ...classification

Individually or in groups, players are asked to classify several objects discovered in the field as if they were to be displayed in a museum or an exhibition hall. Naturally, for every classification they must explain their criteria (use, materials, size, etc.).

Make up a story to connect objects ...interpretation

Seemingly unrelated objects (no more than 7) found in the field are pulled from a bag and players are asked to make up a story connecting them. Who may have owned this? For what reason? When? What happened after? And so on.

The time capsule ...interpretation

A “time capsule” is a container in which modern objects are placed and then buried for people to uncover 100 years from now. Students negotiate the criteria and select which objects are to be buried to provide future generations certain intended messages. The activity needs to have a theme that may be general (e.g. our ways of communication) or specific to the BR (e.g. objects related to our beach, lake etc.).

Name games

Sit in a circle. One person starts, says their name and then says a word or something they like that begins with the same sound. Move on to the left with each person repeating the previous names and same sounding words and then adding their own until you get back to the original person

Or- Sit in a circle. One person starts, then makes a gesture (claps their hands, sticks out their tongue, makes a funny face). Move on to the left with each new person repeating the previous names and gestures and then adding their own until you get back to the original starting point.

Human knot

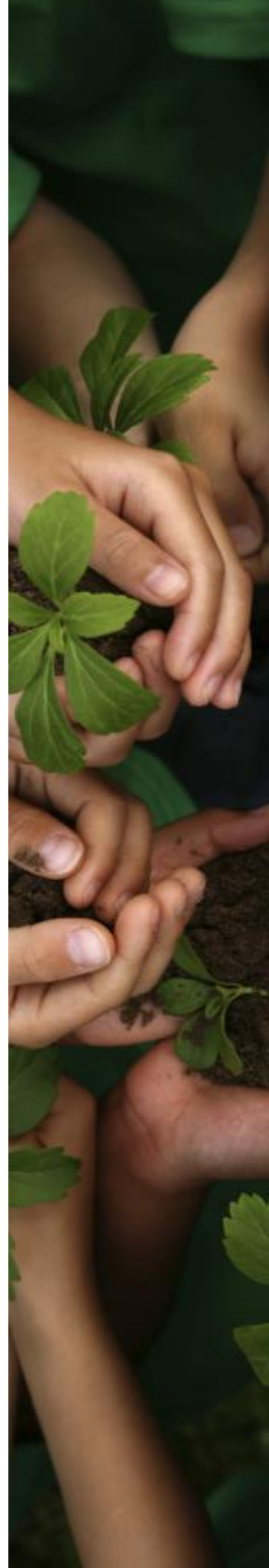
Make group gather up close in a big cluster and put their arms out. Grab a hand and don't let go. Untangle yourselves.

Change 3 things

Students stand in pairs facing each other. At your command, they turn their backs to each other and change 3 things of their appearance. At the command, they turn back around and try to find the differences on their partner.

Lapsit circle

Students stand close together in a circle so that their shoulders are touching. Everyone turns to the right and puts their hands on the shoulders in front of them. Slowly sit down until everyone in the circle is sitting on the knees of the person behind them. See if they can put their hands up in the air without falling over. Maybe even walk together in a circle as a group?





Papermaking

(hangers, pantyhose, scissors, blender, water, newspaper, sponges)

Probe the group the following questions and discuss their answers:

- 🌱 What do we use paper for? (homework, letters, lists, cards, presents, reading...)
- 🌱 What are types of paper we use every day? (newspaper, computer paper, books, notebooks, packaging, posters, boxes, egg cartons, calendars, toilet paper...)
- 🌱 Where does it come from? (trees, other paper.)
- 🌱 Where does it go when we're done with it? (trash, landfill, street, river, on the ground...)
- 🌱 What are some ways we can reuse paper? (write/print on both sides, use scrap paper for notes/lists, reuse envelopes, reuse wrapping paper...)
- 🌱 What are some ways we can use less paper? (email instead of mail a letter, use cloth towels and napkins, erase mistakes instead of getting a new piece of notebook paper...)

Intro - "Today we're going to do a simple version of what happens in a paper recycling factory...."

1. Bend coat hanger into a square. Slip it into pantyhose leg; tie and cut to make secure.
2. Fill blender halfway with water.
3. Tear paper into stamp-sized bits and fill blender. Blend until you have a mushy pulp and cannot see any paper bits.
4. Fill tub with a couple centimeters of water. Dump pulp into tub and mix with your hands. Break up any large chunks. Add any desired decorations.
5. Insert hanger at an angle into tub and bring it from the bottom to the top so there is a film of pulp on the screen. Swish the screen back and forth in the water to get the desired thickness, if necessary.
6. Let excess water drip back into the tub, using sponge on backside to expedite process. Drip pulpy water over any thin spots or over any "decorations" that need to be secured.
7. Place the pulp-covered screen onto a towel, pulp-side up to dry for a couple minutes. Add any additional embellishments.
8. Hang screen up to dry in a not-too-windy place.

Wrap up - (repeat questions about reducing and reusing paper)

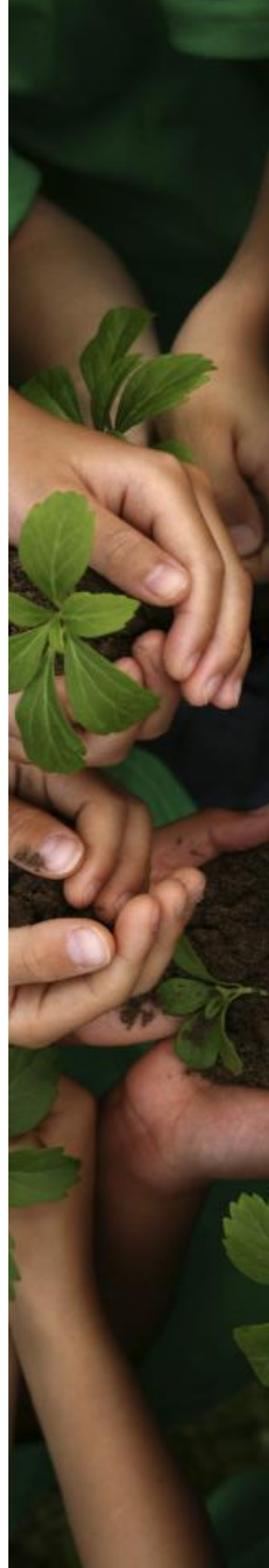
1. Recycling is one way of keeping trash out of the street, a landfill, or out of the air.
What are the two other ways of eliminating (paper) trash? (reduce, reuse)
2. Which are some to reduce the amount of paper we use? (Only print things if absolutely necessary, buy things that don't have a lot of packaging, use chalkboards, whiteboards and PowerPoint instead of paper whenever possible....)
3. What are some ways that we can reuse paper? (Use the backs of clean pieces of paper for printing and notes, save and reuse wrapping paper, give magazines, newspapers and books to someone else to read, cover schoolbooks with newspaper to protect them, use newspaper with window cleaner to wipe windows and mirrors....)

LITTER PICK UP

(markers, paper, gloves, plastic bags)

Intro-“We all have to do our part to help keep the Earth clean. Sometimes this means picking up trash. Today we're looking for the funniest, weirdest, strangest trash! And you get to be the judges! Your group will make 3 awards to hand out after we collect trash this afternoon.” (or something not so lame).

- 🌱 show examples of “awards” (funniest, weirdest, strangest, biggest, grossest, most dangerous, oldest, most cigarette butts, heaviest, smallest...)
- 🌱 (20 min) Break students up into 4 groups. Write down their ideas and help them choose their favorite 3. Give them paper and colored pencils or markers to make their awards. YOU KEEP THEM for now.
- 🌱 Go outside and start collecting trash together as a group, keeping it all together in a big pile. When the time is up, lay it all out and talk about what they found.
- 🌱 Then go around and look at other groups' piles. Decide which groups should get your awards and for which pieces of trash.
- 🌱 Gather together and hand out awards, showing for which pieces of trash they are awarded.
- 🌱 Wash your hands.





LITTERING

Probe the group the following questions:

- What is litter? (something in the wrong place...)
- Where do we find litter? (rivers, schoolyards, streets, parks, EVERYWHERE...)
- What happens to (each of the places answered in the previous question) when we litter? (litter in rivers/polluted water/sick fish, schoolyards/looks bad/grass can't grow, parks/kids play on it/get hurt...)
- Who litters? (kids, parents, EVERYONE...)
- Why do we litter? (easy, too lazy to find trash, uneducated about environment, don't care...)

Take the "Litterbug survey" and discuss the results.

ARE YOU A LITTER-BUG?

	Never	Rarely	Don't know	Some times	Always
Do you drop wrappers in the street?	5	4	3	2	1
Do you leave litter around because you think it is not easy to find a garbage can to put it in?	5	4	3	2	1
If you see discarded litter, do you pick it up?	1	2	3	4	5
Does the sight of litter offend you?	1	2	3	4	5
Are you prepared to take part in a litter-clearing campaign?	1	2	3	4	5
Do you live by the principle: Leave a place cleaner than you found it?	1	2	3	4	5

You can make up your own results for your own points, but here are some moderately lame examples:

- 🌱 30-25 points- Awesome! You care about the environment!
- 🌱 24-20 points- You're off to a good start, keep it up.
- 🌱 19-14 points- You need to try harder.
- 🌱 13-down- Not good, you need to learn more about littering.

Print the "Decomposition" sheet from the PC resource/ CD (on the next page):

1. Ask: What is decomposition? (breaking down into basic parts, rotting)
2. What does organic mean? (made from living things, natural)
3. Go through the sheet first having students guess the decomposition times and then showing them the actual times.

Wrap up-Ask them questions and see if they remember the answers.

1. What is litter?
2. What is decomposition?
3. What happens to the environment when we litter?
4. How long do cigarettes/plastic bags/oranges... take to decompose?

LITTER DECOMPOSITION TIMES

Guess _____

Newspaper



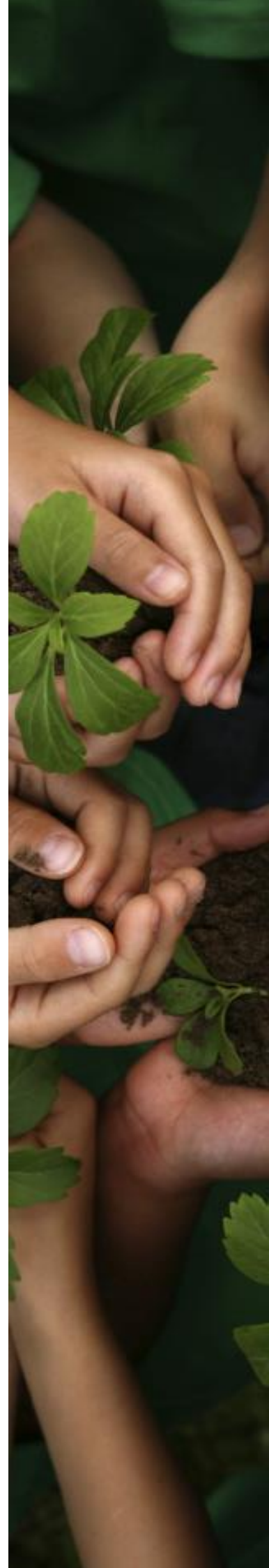
Actual _____

Guess _____

Fruit peels



Actual _____





Guess _____

Actual _____

Guess _____

Actual _____

Guess _____

Actual _____

Guess _____

Actual _____

Guess _____

Actual _____

Guess _____

Actual _____

Cigarettes



Candy wrappers



Plastic bags



Aluminum cans



Plastic bottles



Glass bottles



WATER CONSERVATION

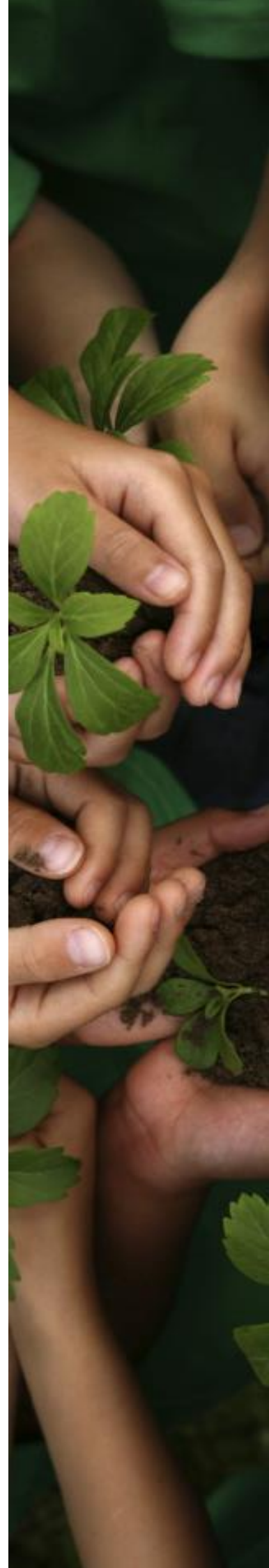
(bottle of colored water, flipchart paper, calculator)

Intro-“A Drop in the Bottle” presentation:

1. “How much of the world is made up of water?” (around 70%)
2. “How much of the world’s water can we drink?” (around .003%)
3. Show students bottle. “This represents all of the world’s water.” Or something more clever.
4. “Where do we find most of the Earth’s water?” (Oceans, seas...). “Yes, 97% of the Earth’s water is salt water. Pour out 97% of the bottle’s water. Now you have just a tiny bit of freshwater left (3%).
5. “And what do you find at the poles of the Earth?” (ice caps, glaciers...) “Yes. And we can’t drink that because it’s solid. 80% of the world’s freshwater is frozen solid.” Pour out 80% of the remaining water. Now, you’re left with a tiny bit o’ water in your bottle.
6. “So here’s the clean, non-polluted freshwater we have left. Not very much. And most of this water is found deep underground and humans have to dig deep wells to get to it. Which means... that this (pour out all but one drop) is the readily available freshwater we have left” (shake the drop in the bottle to emphasize and then slowly pour out the last drop).
7. Discuss.

Personal water meter:

1. “So how much water do you think YOU use in a day? Let’s find out....”
2. Go through the Personal Water Meter together on the flipchart. Do daily water, yearly and lifetime.
3. Then have the students fill out their own. You might want to have a calculator ready.
4. Tell them that: The world has enough water for each person to use 7 million L in a lifetime. How does your lifetime number compare?



PERSONAL WATER METER

	#Per day	X		Total
Glasses of water, tea, coffee _____		0.25 liters per glass		_____
Flushing the toilet		_____	10 liters per flush	_____
Brushing teeth (minutes with Water running) _____		4 liters per minute		_____
Washing dishes by hand (minutes water running) _____		9 liters per minute	divided by #of people in household	_____
(sink with stopper) _____		20 liters	divided by # of people in household	_____
Load of laundry (front load machine) _____		90 liters	divided by # of people in household	_____
Showering (minutes with water running) _____		19 liters		_____
Bath _____		100 liters		_____

Grand total of water usage in one day in Liters _____

Total of water usage in one year in Liters _____

Total of water usage in one lifetime in Liters _____

Notes:

1. Other common water uses not calculated here include: cooking, cleaning, leaking faucets, and watering plants and gardens.
2. On **average**, each person uses about 300- 350 liter of **water** per day, for indoor home uses.

Discuss:

More than 1/3 of the world's population doesn't have access to clean water.

- 🌱 Why?
- 🌱 Where in the world is there not enough water? Where is there plenty of water?
- 🌱 Who else uses water?
- 🌱 How else do humans use water?

Water facts:

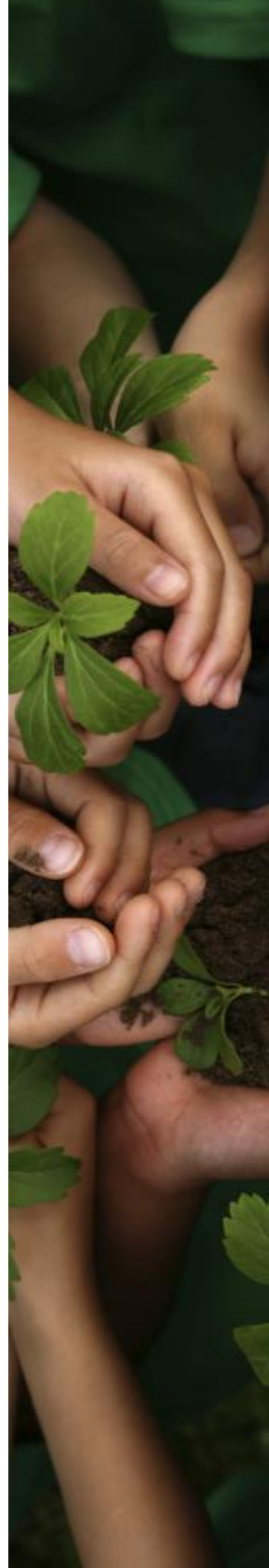
- 28% of household water is used to flush toilets.
- 22% to wash clothes.
- 21% showering
- 5% from leaking toilets.

What can we do?

- 🌱 Fix leaky faucets -1 drip per second=10,233 L per year wasted water.
- 🌱 Turn off water when not in use.
- 🌱 Only do full loads of laundry or dishes.
- 🌱 Limit showers to 10 minutes.
- 🌱 Don't flush trash.
- 🌱 Fill up sink to wash dishes, not let water run whole time.
- 🌱 Use a broom to clean your sidewalk instead of a hose.

Wrap up:

- 🌱 How much freshwater is in the world? (3%ish)
- 🌱 How much freshwater can humans readily drink? (.003%ish)
- 🌱 How will YOU reduce and reuse your daily water supply?





NATURAL RESOURCES

(flipchart paper, popcorn, pretzels)

1. “Who knows what RESOURCES are?” (something that people value and use).
Give a few examples like trees and water.
2. Ask students to name as many resources as they can. List them on flip chart paper.
3. “Good. There are two types of natural resources: renewable and nonrenewable. What do you think these mean?” (renewable resources can be regenerated if used carefully and nonrenewable resources cannot be replaced).
4. List as many of the two types of resources as possible (one on each side of paper). Start with the resources they’ve already listed. (trees, fish, oxygen, freshwater//petroleum, coal)
5. Explain how renewable resources can become non-renewable:

Plants and animals - when they become extinct (define).

Fresh water - when no rain falls for years, chemical spills and other pollution (over ¾ of underground water is “non-renewable” as it takes centuries to replenish).

Trees - when forests are clear-cut (define), soil chemistry changes and the ecosystem changes-plants die, animals lose their habitat.

Oxygen/clean air- when forests and plants are destroyed they can’t absorb carbon dioxide and release oxygen into the atmosphere.
6. Lastly, ask students to list as many things they use in their daily life that come from these natural resources (clothes-cotton, paper-trees, food, water...).

Popcorn activity (non-renewable example)

1. Hand out slips of paper with 1st generation, 2nd generation (twice as many), and 3rd generation (twice as many again).
2. 1st generation comes up to the container of popcorn. Explain that the popcorn represents the world's supply of a non-renewable resource (oil, for example). The first generation is allowed to take as much as they like. Then second generation, also allowed to take as much as they like. Then Third generation, whatever's left.

3. Discuss what happened. Hopefully the 3rd generation didn't get all the popcorn that they wanted. It's a good idea to only fill it with a small amount. How did the 3rd generation feel? How does this apply to the real world? What happens with more people, a really wasteful generation, or pollution?
4. Bring out the secret extra stash of popcorn so they're not sad. Or hungry.

Pretzel activity (renewable example)

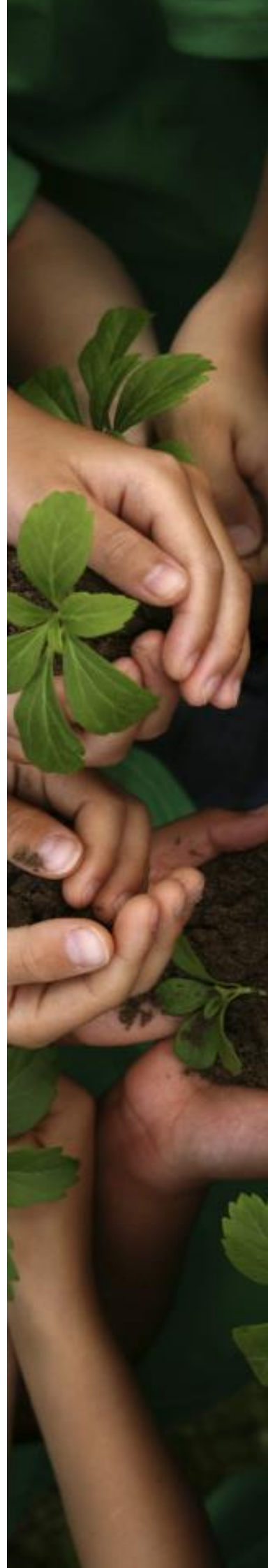
1. Start with about 30 pretzels. They represent the group's supply of a renewable resource. The resource will be replenished at the end of each round by one-half of the existing amount. Each team member can take as much as they like, and at the end of the game they will get to eat whatever they've taken. Each team member has to take at least one pretzel per round in order to survive.
2. Play several rounds, stopping after each round to make sure everyone survived and to replenish the resource.
3. Discuss what happened and eat your resources.
4. Wrap up- Review the definitions for resources, renewable resources, and non-renewable resources. Discuss ways we can reduce and reuse these resources in our daily lives.

POLLUTION

(flip-chart paper)

I would suggest making up posters on flip chart paper to illustrate the three cycles for the kids to look at as you ramble on. This is a very ramble session, unfortunately.

1. Intro- "Our planet, the earth, is like a giant spaceship. Everything we need for survival is on board the ship -- air for breathing, water for drinking and land for growing food. Also like a spaceship, our earth cannot make more air, water or land, or get more from outer space. In fact, the water you drink, the air you breathe and the ground you play on have been around for a very, very long time. Just think, a dinosaur could have drunk the same water that's in your bathtub! This is possible because nature uses air, water and land again and again.





2. How does this happen?

Air-photosynthesis - does anyone know what this is? (like all living things, plants breathe. They take in air through tiny holes (pores) in their leaves. The green stuff in leaves is called chlorophyll. The green stuff uses energy from the sunshine, water and mineral salts from the ground, and a gas called carbon dioxide from the air, to make its food. When a tree makes food, it breathes out a gas called oxygen. Oxygen goes into the air for me and you to breathe. (show chart and explain).

Soil - Soil is not just "dirt". Soil is made up of many, many things. One little spoonful of soil contains more little living things than you could count in your lifetime even if you lived to be a hundred. Soil is made up of minerals from rocks that have broken down into tiny, tiny pieces. It is made up of pieces of things that have died, like leaves and grass clippings. It is also made up of air and water. Good soil needs all these things. When plants die, they decay and become part of the soil again. Then other plants grow from it, and become food for insects and animals, and even for you.

The part of the soil that is good for growing things is called topsoil. The layer under it is called subsoil. Topsoil is very important and takes a long time to make. It takes nearly 100 years to break down enough rock pieces and decaying things from the subsoil to make a layer of topsoil about as thick as a popsicle stick. And it takes another 500 to 800 years to make just one inch of topsoil!

Earthworms like to live in topsoil and pull pieces of leaves, grass and other living things into the soil. They eat their way through the soil and leave tunnels where water and air can move. The things that have gone through their bodies also go back into the soil. (show chart)

Water - Did you ever wonder where water comes from, where it goes, and how it gets there? Or why the clouds seem to have plenty of water? Our earth has a very wonderful system of reusing (recycling) the water that we have. When clouds drop their water on the earth, some of it falls on the ground, some falls on lakes or rivers, or some falls on the oceans.

When the sun shines on water, whether it is on your clothes, on the street, or in a lake, it evaporates and goes into the air (explain evaporation). When it is up in the air, it can move from one place to another. As the little water piece goes up into the air, it gets colder.

When the little pieces of water bump into each other, they give away some of their energy and stick together to form a cloud. Clouds are made up of little drops of water, or if it is cold enough, little crystals of ice.

If these little pieces of water keep bumping together, they form big drops and fall to the earth as rain, hail, sleet or snow. (water cycle chart)

3. Sounds great, right? But what happens when these cycles get polluted?

Ask students what they know about pollution. What is pollution? (when does the air, water, or land becomes dirty through the actions of people). What causes it? What is the effect of pollution on flora and fauna (e.g., acid rain kills trees and may render lakes lifeless)? What kinds of pollution are problems in your area (e.g., exhaust from cars and trucks, industrial smoke, dust and runoff from agriculture or soil erosion from construction)?

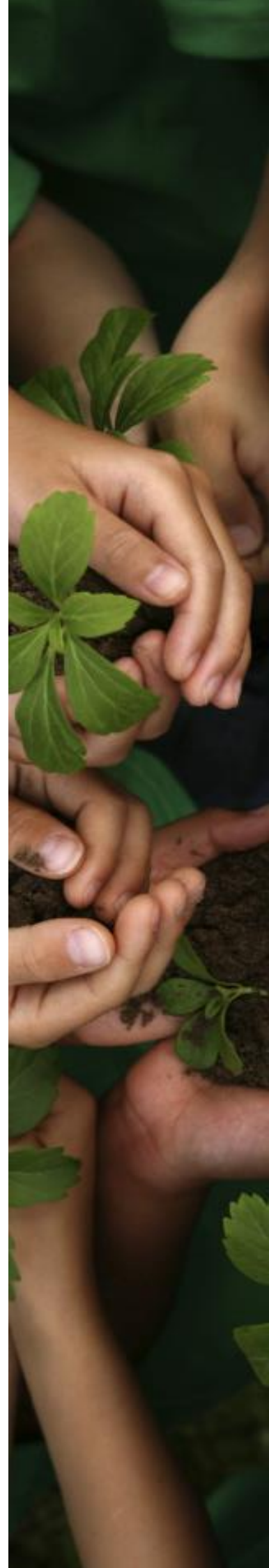
Some types of pollution—such as litter along the beach—are easy to see. Other types of pollution—such as chemicals in the water or air—are not as easy to see but can be even more harmful.

The air we breathe can be damaged or polluted by our actions. Can you think of any ways we pollute our air supply? (burning paper, plastic, leaves and trash; heating homes with wood, coal and oil; using air conditioners; smoking cigarettes, pipes and cigars; driving cars, trucks, motorcycles, air planes and motor boats...)

The quality of land can be damaged or polluted too. Can you think of any ways we pollute our soil? (litter or trash on the land; pesticides or other chemicals building up in the soil; oil dumped or spilled onto land; factory wastes; animal waste from farms; chemicals leaking from underground tanks or landfills...)

Our water supplies can be polluted too. Can you think of any ways we pollute our oceans and drinking waters? (throwing trash into them, oil spills, chemical leaks...)

4. Vocabulary activity—put up vocabulary terms (3 sets) on small pieces of paper on one side of the flip chart paper and their definitions on the other side. Take turns having students match the pairs. Explain the definitions as you go.





Sun	Earth's energy source
Evaporate	To change from liquid to vapor
Ocean	Where most of the Earth's water is found
Water	Cycle how water is recycled
Vapor	Gas form of a liquid
Clouds	Visible masses of water vapor
Atmosphere	Protective layer of air around the Earth
Rain	Water falling from the atmosphere
Snow	Frozen water falling from the atmosphere

In nature, water is recycled through a system called _____. The cycle happens when warmth from the _____ heats up water by a process called _____. This water comes from rivers, lakes and also much from the _____. When the water rises, it forms a _____ and rises to the _____. Up in the atmosphere, the water molecules are cooled and form _____. Then, the water molecules fall back down to earth as _____ and _____.

Earthworms are creatures that improve topsoil by eating plants and passing them through their bodies

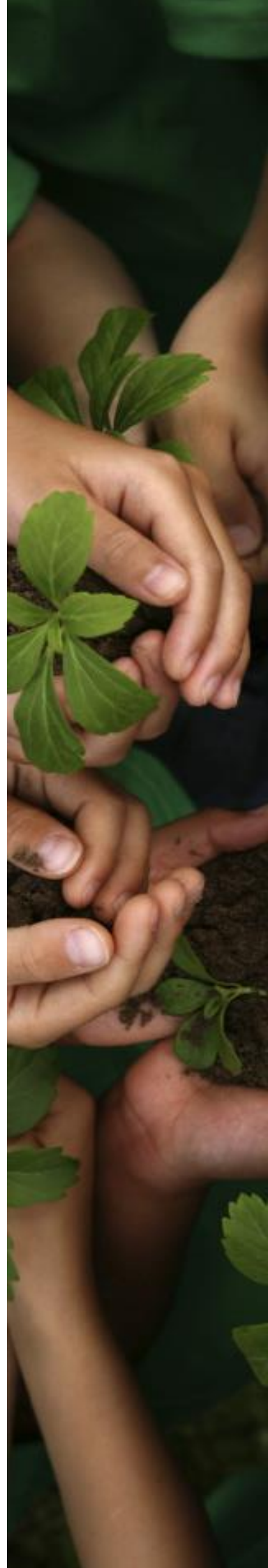
Carbon	Dioxide what we exhale and plants inhale
Topsoil	Top layer of soil, good for growing plants
Subsoil	Layer of soil below topsoil
Leaves	Flat, thin parts growing from a stem
Sun	Earth's energy source
Oxygen	What we inhale and plants exhale
Chlorophyll	What makes plants green and helps photosynthesis

Plants breathe through tiny openings in their _____. The _____ in their leaves uses energy from the _____ and gas in the air called _____ to make their food. When they do this, _____ is released into the air and animals and people can breathe it in. _____ is the part of the soil that we use for growing. _____ is the layer underneath this. _____ live in the soil and eat the grass, leaves and other living organisms and renew the soil as they pass the waste through their bodies.

Water	What we drink
Bicycles	Have 2 wheels
Trash	Solid waste
Polluted	Something made dirty by humans
Air	What we breathe
Containers	Where trash goes

The _____ that we breathe, the earth we use and the _____ that we drink can all become _____ by our actions. When we throw out our _____ we pollute the earth and water. When we burn our plastic and when we drive our cars, we pollute the air. However, if we ride _____ instead of driving our cars and taxis and if we throw our trash in _____ instead of the earth and water, the Earth will be a more beautiful place for our children.

5. Put up the text on flipchart paper and have students take turns reading sentences and taping up vocabulary words in the blanks. When finished, read the text as a whole.
6. What can we do activity-list ways we pollute the air, water and land from the beginning of the session on one side of a flipchart paper and have students brainstorm solutions we can make to these problems?





Wrap up-What is pollution? How do we pollute the air, water and land? What are solutions to this pollution? How does the air, land and water recycle itself?

Discussion questions for extra time-Do you think pollution is responsible for weather changes? Why or why not? Exhaust fumes from cars contribute to smog. What is smog? Should we drive less?

FOOD CHAIN

You should make some posters illustrating the food chain and food web for the kids to look at as you talk here too.

Opening-Do you like to play games? If you do, you will need energy. Every time you run or jump, you are using up energy in your body. How do you get the energy to play? You get energy from the food you eat. Similarly, all living things get energy from their food so that they can move and grow. As food passes through the body, some of it is digested. This process of digestion releases energy.

A food chain shows how each living thing gets its food. Some animals eat plants and some animals eat other animals. For example, a simple food chain in Africa links the trees & shrubs, the giraffes (that eat trees & shrubs), and the lions (that eat the giraffes). Each link in this chain is food for the next link. (show illustration)

1. Make a pyramid of students to physically illustrate the food chain here. Have 3 students volunteer to be grass, 2 to be rabbits, and one a wolf. Or a different combination. Food webs are similar to food chains, but are more complicated and show how many animals are interconnected by different paths. (show example) Let's learn about the different parts of food chains and food webs...
2. Plants are called producers because they are able to use light energy from the Sun to produce food for themselves from carbon dioxide and water. Animals cannot make their own food so they must eat plants and/or other animals. They are called **consumers**. There are three groups of consumers. Animals that eat ONLY PLANTS are called herbivores. Animals that eat OTHER ANIMALS are called **carnivores**. Animals and people who eat BOTH animals and plants are called **omnivores**.

3. Making food chains-Put a word bank on a flipchart paper including (grass and flowers, bees, small birds, cats; and wheat, grasshopper, flies, frogs, hawks) in mixed order. Have students put them in order. Then have students make their own food chain in small groups.

4. Making food webs-Show students the illustration of the food web and ask them the following questions: 1. Identify the organism(s) that are producers? 2. Identify the organism(s) that are consumers? 3. List some of the food chains by writing the organism's name and drawing a line that points to the next organism in the food chain. 4. How many food chains can you find in the above food web?

Discuss-What would happen there was no sun? (Discuss how the sunflowers wouldn't grow, and how this would in turn impact the grasshoppers, which would impact the birds, which would impact the bobcats.)

What would happen if people ripped out all the wheat? (Discuss how this would impact the grasshoppers, which would impact the birds, which would impact the bobcats.)

What would happen if people sprayed insecticides to kill the bugs? (Discuss how this would impact the birds, which would impact the bobcats.)

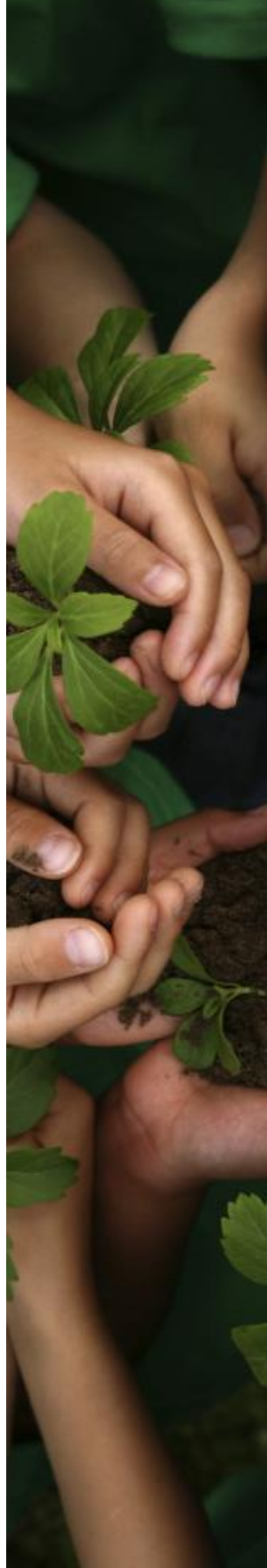
What would happen if a large number of birds died from a disease? (Discuss how this would impact the bobcats.)

5. Food chain tag-Divide students up into representative groups of flowers, grasshoppers, birds, and bobcats. You get to be the sun. Tell them they are going to play tag, but that they can only tag people who are lower than they are on the food chain. Once they are tagged, they have to stand still. Discuss who is left standing at the end. Play several times.

ROLE PLAYING

Intro-Start off by being an example (2-3 teachers). Read out loud your scenario, quickly pretend to figure out how you'll act it out, and then perform it for the students.

1. Divide students up into groups of 2 or 3 and hand them one scenario. Give them 10-15 minutes to read it, decide on a solution and practice acting it out.
2. Students take turns acting out their scenarios for the rest of the camp.





Littering/solid waste:

- 🌱 You and your friend go to the store to buy a candy bar and a soda. The clerk tries to give you a plastic bag, but you say you don't need one. Your friend asks, "Why, they are free? You can just throw it away later. Just take one!" What do you say?
- 🌱 Your family lives in a village and sometimes the garbage from your house isn't collected regularly. Your dad says it would be easier to just take it to a field nearby and dump it. What could you tell him?
- 🌱 You and your friend are walking and you throw your banana peel on the ground. Your friend sees this and throws her Stobi Flips bag on the ground. You tell her that's littering, but she says you did it too. What do you tell her?
- 🌱 Your friends always smoke outside the school during breaks and leave their cigarette butts on the ground. What could you tell them?

Conservation/natural resources:

- 🌱 You and your friend are going to visit another friend on the other side of town. Your friend wants to take a taxi because it will take 30 minutes to walk. What could you suggest?
- 🌱 You and your colleague both work on the computer a lot. Every day you must print things out. You notice that she doesn't print on both sides of the paper and never uses old paper for anything. She throws paper away all the time. What could you suggest to her?
- 🌱 Your family has a lot of extra jars and cream containers and always throws them away. What could you suggest to them to reduce the amount of trash?
- 🌱 It's wintertime and your sister is complaining that it's too cold in the apartment and she wants to turn the heat up. She's wearing jeans and a t-shirt. You are wearing a sweater and you're not cold. What should you tell her to do?
- 🌱 Your friend always asks you to borrow notebook paper at school. One day you notice she only writes on one side of the paper. What could you suggest to her?

Water conservation/natural resources:

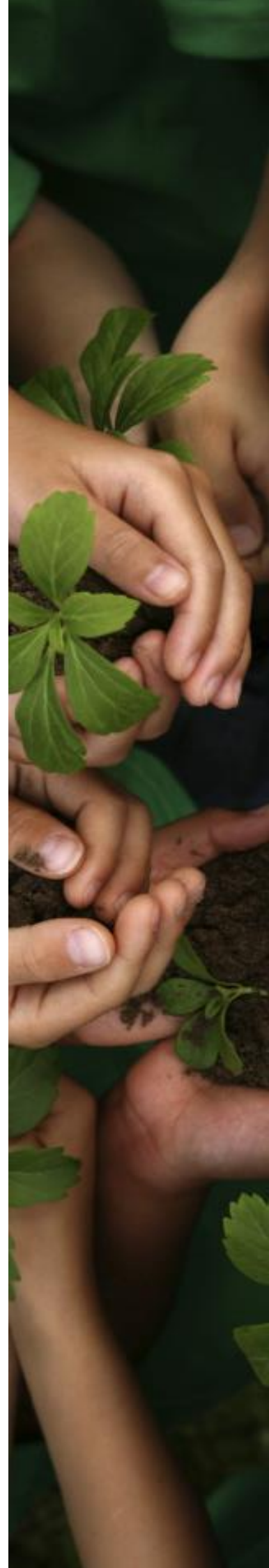
- 🌱 Your little brother is learning how to brush his teeth. He's doing a good job and is proud of himself. He leaves the water running the whole time he is brushing. How could you explain to him a better way to brush?
- 🌱 Your big sister takes forever to get ready to go out. She sometimes takes 30-40 minutes showers. What could you tell her?
- 🌱 Your mom owns a little store and every day she hoses off the sidewalk in front, using a lot of water. What could you tell her to do to keep things clean without using so much water?

FIELD DAY GAMES

Duplication - Gather from the area about 10 common natural objects, such as rocks, seeds, plant parts and signs of animal activity. Lay the objects out and cover them with something so the students can't see them. Tell the students, "under this are 10 natural objects that you'll be able to find nearby. I'll show them to you for 30 seconds so you can take a good look and try to remember everything you see."

After looking at the objects, the children will spread out in their (pre-assigned) groups and collect identical items, keeping their findings to themselves. After 5-10 minutes of searching, call them back. Dramatically pull out the objects from hiding, one at a time, telling interesting stories about each one. As each object is presented, ask the students if they found one just like it. You can repeat this game several times and either change the items or leave them the same.

Scavenger hunt- On a flipchart paper, list the following things (and whatever else you feel like) for the students to find. Go over them as a group. Divide them up into groups or partners. Give them 10-15 minutes to find as many things on the list as they can. There are two options for judging. They can either bring the items back to the main area for you to see or if that's not possible, educators can go around and check out the items found.





- something green
- something alive
- something slimy
- something bending towards the sun
- something telling you the wind is blowing
- sign of a human
- something that bends in the wind
- something the color of the sky
- something dead
- something that doesn't bend in the wind
- something brown
- something manmade
- something wet
- something in a pair
- something left by the rain
- something hiding from sunshine
- sign of an animal
- place to seek shelter from a storm
- something shaped by water
- something the color of snow

Blindfold game

Sit groups of students in circles with their backs to the center. One or two teachers stay in the middle of the circle with a pile of 10-12 natural objects (leaves, sticks, rocks...). Tell students they are going to feel several objects now but that they can't turn around and look at them. Teachers in the middle help pass 3-5 objects as the students take turns feeling them. After everyone is done, place the objects passed around with the rest of the objects in the circle. Ask students to identify the ones they felt in the correct order. Repeat several times with different objects.

ADVICES FOR PERSONAL PARTICIPATION IN THE PROCCESS OF SAVING THE PLANET

We have the power to save the world. Never be skeptical about the power of one. There is plenty that one person - you – can do to save the earth. Hopefully, the following will provide ideas on how to start.

THINK BEFORE BUYING

When buying something, start from the premise, "What do I need?" not "What do I want?" The latter attitude is often expressed in the absurd concept of window-shopping. This entails putting yourself into the advertisers chosen territory. The indoor shopping mall represents nothing less than the commercialization of social interaction.

GIVE SMART PRESENTS

Love is viewed in the market as a way to sell more products, but you can combat that consumerist idea by giving corporation-free presents. Buy a professional massage for someone, or pay for a class for them. Make cookies and brownies to give as presents and include the recipe. Write your own cards and make your own paper. Organize a picnic. Make a donation to a charitable organization in someone else's name as a present. Share quality time. Have a clothing exchange. Show your love by saving the earth.

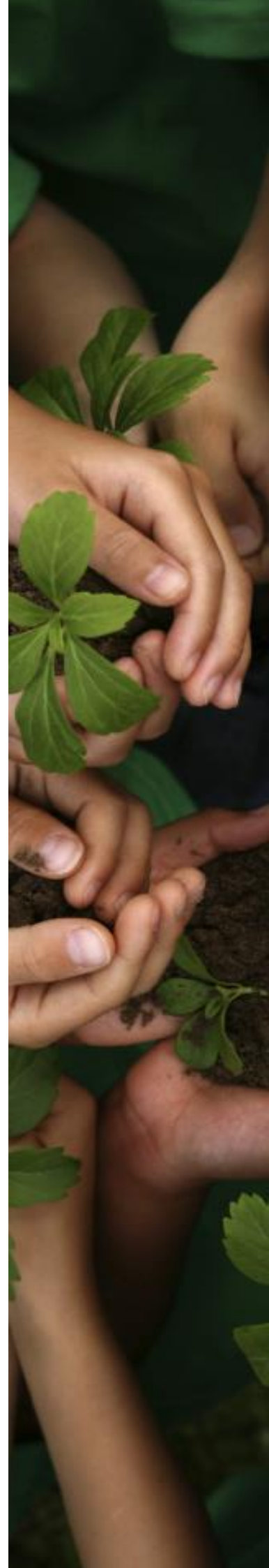
START COMPOSTING

Organic food and garden scraps account for one third of the waste stream of the average household. Composting is an essential component of any waste reduction effort because organic waste, when sent to the landfill, contributes to the buildup of methane (a greenhouse gas) and toxic liquids during the decomposition process.

- 🌱 Compost in your backyard by simply starting a compost pile or building a compost bin.
- 🌱 If you want to compost, but live in an apartment or don't have a back-yard, then worm-compost. Worm-composting allows you to turn your organic waste into a nutrient-rich soil conditioner for your plants in a small space.
- 🌱 You can compost...uncooked fruit and vegetable scraps, eggshells, coffee grinds and paper filters, tea bags, plant clippings and shredded yard waste
- 🌱 You can't compost...dairy products, meat, fat or bones, cooked foods, grains and breads

REDUCE YOUR PAPER USE

- 🌱 Use as little paper as possible!
- 🌱 Edit your work directly in the computer!
- 🌱 Print on both sides of the paper before recycling!
- 🌱 Make all photocopies double-sided!
- 🌱 Reuse envelopes by opening carefully and using labels!





REDUCE YOUR ENERGY USE

- 🌱 Turn off lights, appliances, televisions and computer when they're not needed.
- 🌱 Seal all leaks around doors, windows and cracks where heat escapes – and save up to 20percent on your heating bill
- 🌱 Do the atmosphere a favor: do full loads of laundry, run the dishwasher when it is full and run both in non-peak-hour periods such as early morning or late evening.

GROCERIES ARE GOOD, BUT NO BAG IS BETTER

Only about 700 paper bags can be made from one 15-year old tree. A large grocery store can use that many bags before lunch. Plastic bags start out as either oil or natural gas. Oil and natural gas are non-renewable resources. Also, manufacturing these bags adds a lot of pollution to the environment. Once plastic and paper bags are used and go to landfills, they stay there for hundreds of years!

What can you do? If you have only a few items, ask the clerk not to give you a bag. Take your own plastic bags with you or a permanent cloth bag.

GO VEGETARIAN

Raising animals has serious environmental impacts. Cattle produce methane, a very powerful greenhouse gas. Cattle also require large areas of pasture, and in many countries, forests are being clear-cut to grow pasture. Raising animals for food requires more water than all other uses of water combined, causes more water pollution than any other activity, and is responsible for soil erosion. Many environmental groups, including the National Audubon Society and the Union of Concerned Scientists, have recognized that one of the most important steps you can take to save the planet is to go vegetarian.

RESPONSIBLE CONSUMPTION AND PRODUCTIVITY ACTIVITY

CREATE A SCHOOL GARDEN USING COMPOST

Raw food materials are needed for compost.

Schools offering meals may use the ingredients from the food thrown in the kitchen.

In schools that do not offer meals, such as most schools in Greece, students will offer such food scraps from their homes, on a daily basis.

We will use this material (compost) as fertilizer to create a vegetable garden. In the beginning we can ask for help of a gardener.

In this way we reduce the garbage that we throw at home or at school and we use them in a creative way.

NO POVERTY ACTIVITIES

HELP HOMELESS PEOPLE

As long as the vegetable garden is growing, we can, once a month, distribute products that we produce to homeless people or pure families, in the area where the school is located.

This activity can be done in collaboration with the municipality.

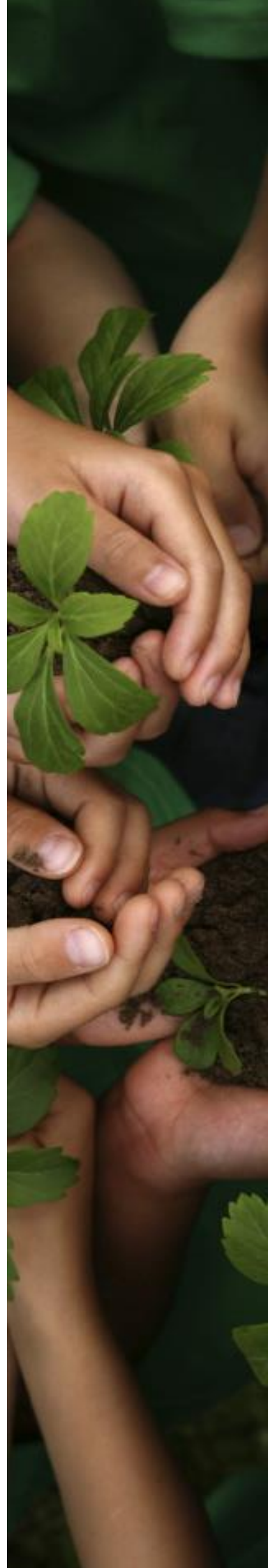
In this way the school can help the financially weakest people and we achieve partnership for a goal.

DONATE

Give all clothes, furniture and household you are not using.

Twice a year, the school can organize a charity bazaar with clothes that are not used by students and teachers.

In these bazaars can offer small furniture and household items, in good condition, that usually end up in trash.





CLIMATE ACTION ACTIVITIES

BE SMART ABOUT TRANSPORTATION

It is known that public transport produces exhaust gas and contributes to the pollution of the environment.

Students can find environmentally friendly ways of moving.

Use of bicycles, skates, electric skates and for older students' electric cars.

To promote this idea students will organize a photo exhibition for means of ecological transportation.

USE LESS PAPER

It is well known that paper is wasted in schools.

For this reason, most schools implement paper recycling programs.

Moreover, students working with teachers can find ways to reduce paper use.

If it is required for student classwork to be printed out, try reducing margins and spacing and print double, it may also be a good idea.

In consultation with teachers to agree to submit their assignments online.

BUY LOCAL BUY GREEN

Intensive land cultivation and use of pesticides create serious problems for the environment and health of consumers.

In recent years there has been an attempt by small farmers to produce organic products.

Students can find local farmers' markets to use in place of malls and super market.

Also, students can help advertise these markets by making their own brochures and posters.

For this reason, in collaboration with the teachers of the art courses to organize a competition between the students for the creation of the best brochure and poster.

Simultaneously with help from computer science teachers find ways to promote these markets electronically.

These activities can help offset carbon footprint.

CONSTRUCT GREEN ROOF GARDEN IN SCHOOL

Green roof in school can effectively reduce heat and cooling costs and also improve air quality in polluted areas.

At first, we can try creating on a small structure filled with herbaceous plants.

If it works, we have to hire a structural engineer to make sure the roof can support the weight of a green roof

PARTNERSHIP TO ACHIEVE A GOAL ACTIVITY

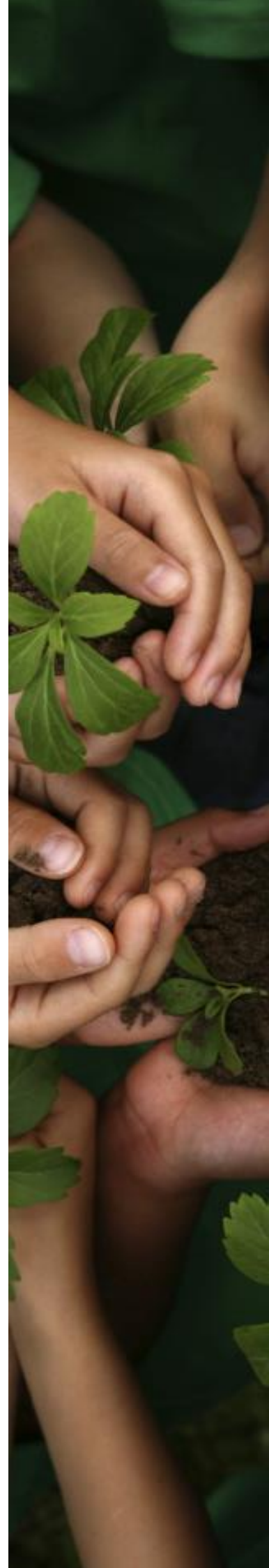
JOIN AN ENVIROMENT GROUP

The school can join an environment group or even better create one with local schools and organizations.

The center of this activity will be the office of sustainability centered in one of the participant school.

The aim of this activity is to monitor and promote good practices of sustainable green development at local level.

For example, use of transport means that will reduce environmental pollution or business practices for green growth.





PUT RAINWATER TO USE

During an average rainstorm more than 700 gallons of water run off the roof of a typical building.

The school collects rainwater in tanks and uses it for watering and cleaning the building.

This is a long-term project because it requires infrastructure.

The school has to cooperate with other agencies, such as the school building organization and the local government.

The impact of this project will have positive effects to the environment and set an example for other institutions, such as universities, public sector etc.

USE OLD/UNUSED MATERIALS FOR OTHER PURPOSES

“One man’s trash is another’s treasure”.

Teachers and students and their families adapt a new attitude.

They don’t throw away stuff that it is old just because it is old.

Students can find uses for them.

Old devices (such as television, vacuum cleaners etc.) can be used as training devices for vocational schools.

It is possible with the guidance of teachers to make a stock of spare parts for old electrical appliances and be available in the local market.

REDUCE PACKAGING

Everything we buy comes in some sort of package.

Packaging made from a variety of renewable and nonrenewable resources, is necessary to protect an item and also transport and store.

In this activity students will examine the pros and cons of different packaging strategies.

They explore how to reduce single use plastic to protect the environment.

They can up cycle classroom scraps to create models, artwork and project made with recycled materials.

Each class can determine how much waste it generates and where it goes.

Appoint a “recycling monitor” to remind classmates of ways items can be recycled and reused.

LIFE BELOW WATER ACTIVITY

CREATE NON-TOXIC PRODUCTS

Students can create non-toxic products for cleaning their own school.

Toxic substances such as bleach are known to be used in cleaning product.

These products contribute to sea pollution.

Students with help from chemistry teachers can prepare, on a permanent basis, in the respective course the cleaners that are necessary for cleaning the school.

It is a small contribution for the purification of seawater.

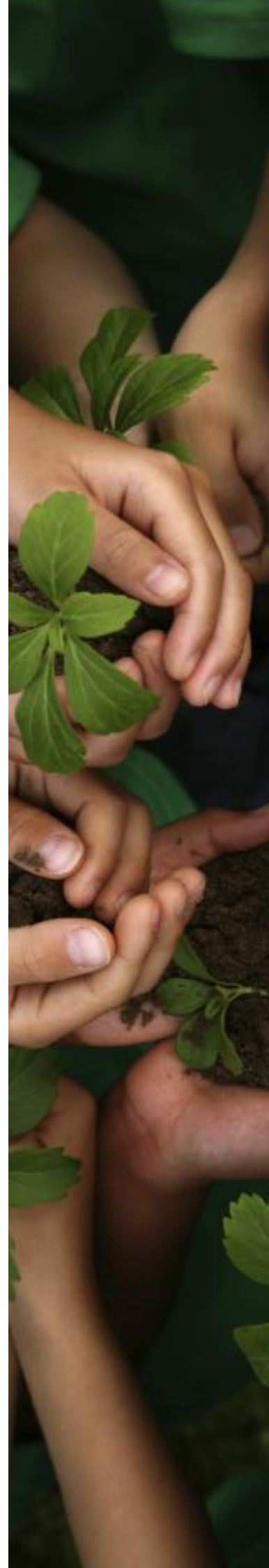
SUSTAINABLE CITIES & COMMUNITIES ACTIVITY

SET A CAMPAIGN

The school once a year will run a campaign to communicate all the practices it has followed to promote sustainable development practices.

Signs and murals are great for a school to show its commitment to healthy and sustainable learning environment.

Also provides a teaching opportunity for students and adults alike.

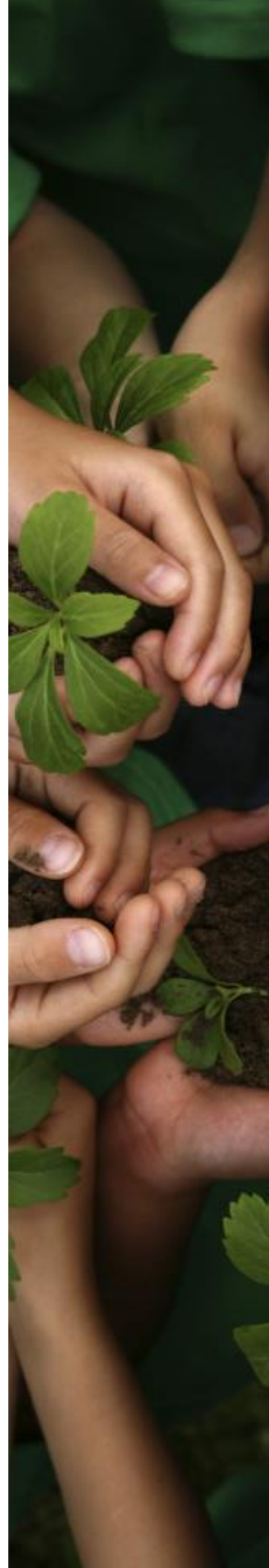




This activity will bring together volunteers, parents, teachers, students and local organization to contribute to sustainability project in school that create a lasting impact.

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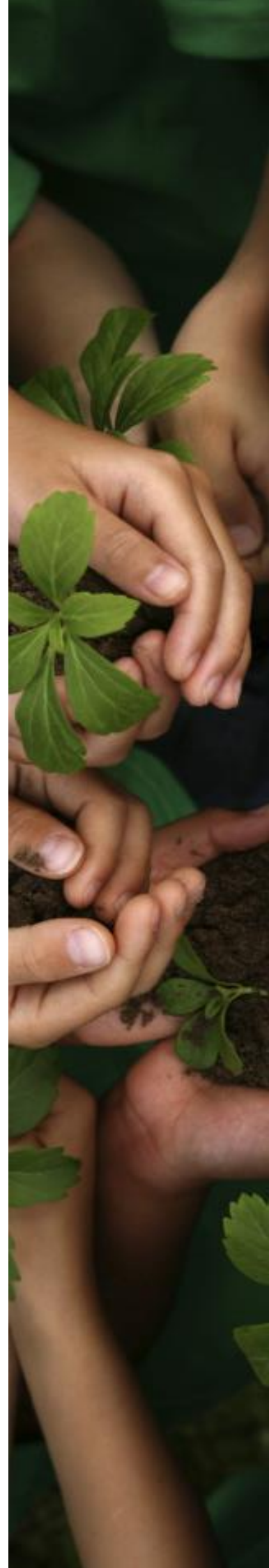
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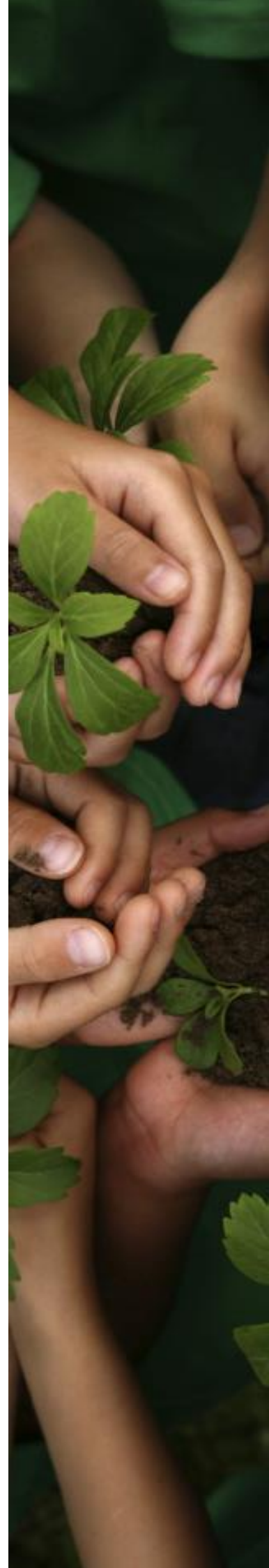
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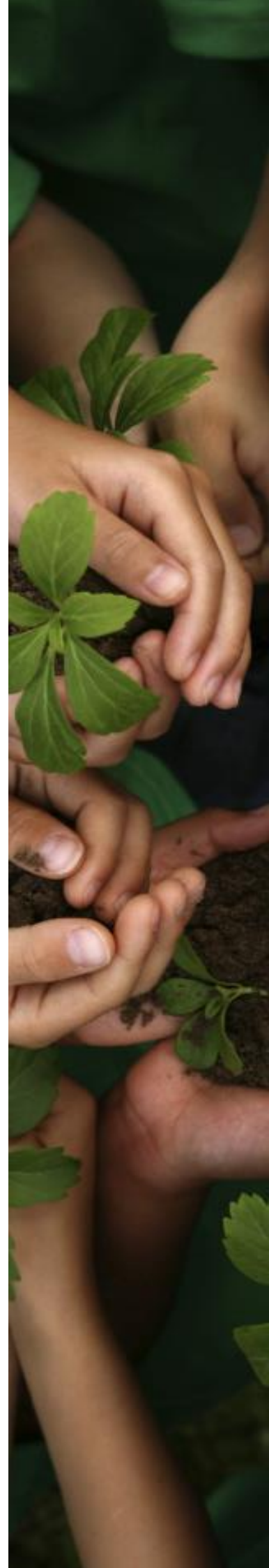
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