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TOWARDS A SUSTAINABLE SOCIETY: A TEACHING GUIDELINE FOR SUSTAINABLE DEVELOPMENT THROUGH FORMAL AND NON-FORMAL EDUCATION

Teacher Training Curriculum on Environmental Issues


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TOWARDS A SUSTAINABLE SOCIETY: A TEACHING GUIDELINE FOR SUSTAINABLE DEVELOPMENT THROUGH FORMAL AND NON-FORMAL EDUCATION

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TOWARDS A SUSTAINABLE SOCIETY: A TEACHING GUIDELINE FOR SUSTAINABLE DEVELOPMENT THROUGH FORMAL AND NON-FORMAL EDUCATION is written and produced by Anna-Karin Westman, Madonna Pettersson and Richard Hurst for Erasmus+ project, Active Citizenship and Environmental Awareness Through Formal and Non-formal Education.

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Preface

Designed by teachers, this publication serves as a guideline for teachers to help them to understand the importance of the education for sustainable development and to reignite their dreams and visions for a better future. This publication is a part of the project and is produced in order to provide ideas and methods in which education for sustainable development can be integrated into the mandated course curriculum in a simple and easy way.

Education for sustainable development (ESD) is an extensive area and to accomplish a manageable project, the partner schools decided to focus on only six goals of the United Nation's 17 global goals on the new sustainable development agenda, published September 2015, but all partner schools should feel free to work with any of the 17 global goals that are appropriate to their local or national issues.

The publication begins with a short history for sustainable development and its definition and the necessity of a sustainable society. It also discusses the importance of implementing education for sustainable development into the school curriculum and the role of schools in teaching sustainable development. It highlights some key sustainability issues and provides ideas how to make education for sustainability a part of everyday teaching without giving teachers anymore work. It concludes with practical examples using both formal and non-formal methods which have been experimented across subjects in various levels of the schools' system in the eight different countries in the project, "Active citizenship and environmental awareness through formal and non-formal education".

The project is funded by the Erasmus + and the eight partner schools are from Romania, Poland, Portugal, England, Sweden, Lithuania, Czech Republic and Italy. The age of the students participating in the project varies between 9 years and 18 years.

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We have only one Earth

The year 2015 ended with more than 16 000 homes being flooded in Scotland and Northern England, approximately 43 people died in the United States due to severe weather conditions, including floods in the southern states and tornadoes in Texas. As if this was not enough, more than a million Syrian migrants and refugees crossed into Europe to find protection and shelter and nearly three million Malawians struggled to find food and clean water and had to depend on WHO for vaccine due to cholera. The list is endless.

As Richard McLellan, the Director of Footprint at WWF International says, *"we have only one Earth and we are all connected in this single, living planet. It's our only home and it's in dire need of attention"*.[1] Human impacts on Earth have been felt for a long time. According to *The Living Planets Report*, 2008, published by WWF, we are consuming the Earth´s natural resources at a tremendous speed. For example, *"Swedes today have an average ecological footprint of 5.9 global hectares and is ranked 13 in the list of countries with largest footprint per person. If all people on Earth were to live like Swedes, we would need 3 planets."*[2] (Sustainable Schools, WWF)

Sustainable development

There are many different definitions for sustainable development but the one that catches our attention most is,

> *"It is a way of thinking about how we organise our lives and work – including our education system – so that we don't destroy our most precious resource, the planet. Sustainable development means inspiring people in all parts of the world to find solutions that improve their quality of life without storing up problems for the future, or impacting unfairly on other people's lives. It must be more than recycling bottles or giving money to charity. It is about thinking and working in a profoundly different way* or to put it another way: *Enough for All, Forever".*[3]

The concept of sustainable development became widely known in 1987 through the UN report, *Our Common Future*, also known as the Brundtland report[4]. The report emphasises that one can only solve sustainability issues by integrating ecological, social and economic dimensions, and thus get a sustainable society. In practice it is a great challenge to take into account these three dimensions simultaneously, and the International Institute for Sustainable Development describes the conflicts that may arise in their report from 2010:

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1 http://ensia.com/voices/we-only-have-one-earth-so-we-better-start-taking-care-of-it/ retrieved 9th Jan, 2016

2 www.wwf.se

3 From teachernet.org.uk/sustainableschools – no longer available on line

4 http://www.un-documents.net/wced-ocf.htm

While sustainable development is intended to encompass three pillars, over the past 20 years it has often been compartmentalized as an environmental issue. Added to this, and potentially more limiting for the sustainable development agenda, is the reigning orientation of development as purely economic growth. This has been the framework used by developed countries in attaining their unprecedented levels of wealth, and major and rapidly developing countries are following the same course. The problem with such an approach is that natural resources are in imminent peril of being exhausted or their quality being compromised to an extent that threatens current biodiversity and natural environments.[5]

A sustainable society is far from being achieved yet. The challenges that we see today are different from the challenges that our previous generations had and most certainly different from the challenges our future generations will face. What then can we do to make the Earth, "E*nough for All, Forever"*?

Towards a sustainable society

How do we contribute towards a sustainable society? Well, there isn't any simple and straightforward recipe, which we all can follow in order to achieve a sustainable society. This maybe is good, since all societies are not homogeneous. However it's important to keep in mind that achieving a society that will be sustainable in the future, doesn't happen all by itself. Every member of society has to be ready to put in enough effort, big or small, towards the one single goal - a sustainable future.

Now the question arises, how do we make every member of the society understand the value of a sustainable future so that they are willing to make an effort towards achieving it? According to Sir Peter Scott, one of the founders of World Wildlife Fund (WWF), "... *the most important task, if we are to save the Earth, is to educate."* [6]

Yes, education is our only answer. Education provides knowledge and understanding for the need of a sustainable society thus encouraging us to take, that one extra step, towards a new line of thinking for the survival of this earth and the day we manage to achieve this, half the war will be already won. The best way to accomplish understanding for the need for a sustainable society is to induce the education for sustainable development at an early age so that living a sustainable life becomes a part of every individual.

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5 Sustainable Development: From Brundtland to Rio 2012, retrieved 20160105 from: http://www.un.org/wcm/webdav/site/climatechange/shared/gsp/docs/GSP1-6Background%20on%20Sustainable%20Devt.pdf

6 http://www.csu.edu.au/go/welcome-2014/quotes/quotes-source

The role of schools in teaching sustainable development

In Sweden, there is a saying that "the future begins in the classroom". This is, in fact, true. Schools are responsible for giving the future citizen, life-long education so that they can become self-sufficient, manage to improve the quality of their lives and be able to make the right decision thereby helping in the development of the society. This is why it´s important and extremely essential that schools make the Education of Sustainable Development, a part of their teaching curriculum.

Unfortunately, Education for Sustainable Development (ESD) is still just a notion in many European schools. In Europe, people still treat education of sustainable development superficially, especially children and youngsters. Therefore school, which are the main supplier of education, in cooperation with the respective community must issue adequate, attractive, accessible and efficient strategies so that they may acquire and manifest an environmentally conscious behaviour.

According to the Swedish Council of Education, education should provide opportunities to develop pupils' ability to evaluate solutions to environmental and developmental issues on the basis of ethics and sustainable development. Education should illuminate on how the functions of the society and our life style can be adapted to attain sustainable development.[7]

The Education curriculums in the other countries too, have some specific ideas how environmental issues and sustainable development should be incorporated into the education.

In spite of that, not all educators are equally enthusiastic or willing to commit to sustainability education. Those educators wishing to incorporate sustainability concepts into their classrooms often face resistance from other teachers or administrators in their educational setting. The obstacle, often mentioned by educators, is lack of time – time to learn something new, or the time to introduce an idea external to the curriculum. This is summed up in the following quote from a department head in a medium-sized public school: "*We'd love to integrate sustainability into our classrooms, but there is little to no room in the curriculum for add-ons.*[8]

Most teachers will agree that, we educators are often forced to keep to the mandated syllabus due to the fact that we have to maintain the deadlines for National Exams, etc. This leaves us with very little time to even consider adding new ideas into our planning. But we will all have to also agree that irrespective of which country we belong to or which level of students we have or what National exams we have to prepare our students for, the National Education Curriculum of all our eight

7 Curriculum for the upper secondary school, Skolverket, Stockholm 2013, ISBN: 978-91-7559-022-6. Any reference to this publication will be within brackets and as (GY11).

8 Wendy Church and Laura Skelton, **Sustainability Education in K-12 Classrooms** https://www.facingthefuture.org/Portals/0/Documents/Articles/Informational%20Papers/Sustainability%20Education%20in%20K-12%20Classrooms.pdf (assessed January 4th 2016) Any reference to this publication will be as Church and Skelton.

project countries, have certain things in common, that is, "schools are to stimulate the creative curiosity of pupils and help increase self-confidence and willingness to try out their own ideas. Pupils should also be given opportunity to use their knowledge to reflect, critically examine, analyse and solve problems. Pupils should be able to take initiative and responsibility thereby developing their ability to work both independently as well as in collaboration with others".

But then how do we, educational professionals, make the children of today not only accomplish all this but also help them in becoming active citizens?

Church and Skelton, in their publication, Sustainability Education in K-12 Classrooms, claims that, the concept of sustainability can provide a wonderful context for developing the skills of critical thinking, systems thinking, collaboration, and communication. In their report, they quoted a teacher who had incorporated sustainability lessons into his classroom:

> *"The nature of lessons on sustainability requires that students apply critical thinking skills and that they draw from their own experiences and world knowledge. The interactive characteristic of the activities invites the participation of all students."* They also believe that "*readings and activities that enable students to grapple with real-life, real-world issues and combine them with opportunities for reflection and syntheses make learning authentic*".

According to *Education for Sustainable Development Toolkit*, 2002, ESD helps develop the ability to separate number, quantity, quality, and value. [9] UNESCO affirms that it promotes participatory learning and higher-order thinking skills. It also promotes lifelong learning and helps build civil capacity for community-based decision-making, social tolerance, environmental stewardship and provides good quality of life.[10] Since education for sustainability is future oriented, it prepares the learners for their world and their future.

Another reason why, schools play an important role in the education for sustainable development is because if we have to create the future we want and need, we should be able to envision what is not yet formed and dare to dream beyond our current reality.[11] As we all know, children by nature possess abundance of creative ideas waiting to be acknowledged by adults. Sir Ken Robinson in his speech on "Do schools kill creativity?", spoke about the innovative capacity of all children and how we adults pretty ruthlessly squander them.[12] If we can manage to encourage children to develop their creativity and natural visions to co-create sustainable outcomes and solutions, our job as educators, will become fairly easy and enjoyable. This will also give us the innate capacity to reach every child placed in our care. In the words of the social science teacher, who noted how a lesson on depletion of natural resources in the social science lesson helped engage all of her students:

> *"The hands-on activities brought in another dimension of learning and brought my tougher-to-reach kids into the lesson."*(Church and Skelton)

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9 www.esdtoolkit.org

10 http://www.unesco.org/new/en/education/themes/leading-the-international-agenda/education-for-sustainable-development/education-for-sustainable-development/ (assessed 4th of January, 2016)

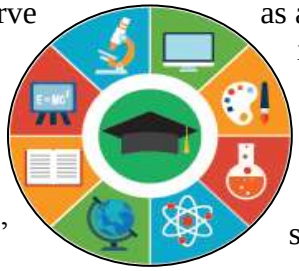
11 http://educationforsustainability.info/learn/creativity-visioning/ (assessed 5th of January, 2016)

12 https://www.youtube.com/watch?v=iG9CE55wbtY (viewed 30th of December, 2015)

Purpose of the Study

It is with the above background and rationale that the teachers in the project, *Active Citizenship and environmental awareness through formal and non-formal education*, plan to work with the idea of integrating the ESD with subjects like English, mathematics, biology, chemistry, physics, mother tongue, geography, social science, history, etc. which are a part of the national curriculum in almost all levels in the eight project countries.

The purpose of this paper is to serve as a guideline for teachers and other educators to help them to understand the importance of the ESD. It also aims to provide methods and ideas, how to, without a lot of extra work, integrate sustainable development into the mandate curriculum for different subjects. The paper also provides a few ideas both formal and non-formal, which have been experimented across subjects/curriculum in various levels of the schools' system in the eight different project countries.



It concludes by stating the importance of the "whole school approach to ESD" and presents some ideas and thoughts that can easily make ESD a part of the daily school activities.

The six thematic areas

In September 2015, World Leaders committed to the Global Goals for Sustainable Development. Seventeen goals to achieve three extraordinary things in the next 15 years[13].

1. End extreme poverty.
2. Fight inequality and injustice.
3. Fix climate change.

If every school in the world teaches children about these goals, [we] will help them become the generation that changed the world.

Since it will be difficult to focus on all the 17 goals, in this project, *Active Citizenship and environmental awareness through formal and non-formal education*, six thematic areas were identified, which could be used to teach sustainable development in the eight European project schools. These six goals[14 15]are:

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13 http://www.un.org/sustainabledevelopment/development-agenda/ (assessed 28th of Oct, 2015)

15 http://www.un.org/sustainabledevelopment/sustainable-development-goals/ (assessed 28th of Oct, 2015)

15 See individual link below for more details on UN target for each goal.
http://www.un.org/sustainabledevelopment/water-and-sanitation/
http://www.un.org/sustainabledevelopment/energy/
http://www.un.org/sustainabledevelopment/sustainable-consumption-production/
http://www.un.org/sustainabledevelopment/climate-change-2/
http://www.un.org/sustainabledevelopment/oceans/

- Global Goal 6 – Clean water and sanitation
- Global Goal 7 – Renewable energy
- Global Goal 12 – Responsible Consumption
- Global Goal 13 – Climate action
- Global Goal 14 – Life below water
- Global Goal 15 – Life on land

It is important to point out here that, all partner schools should feel free to work with any of the 17 Global Goals that are appropriate to their local or national issues during the project.

How can the Global Goals for Sustainable Development be incorporated

In order to efficaciously integrate the global goals for sustainable development education into the mandated curriculum, the following steps need to be considered.

Competencies for Educators

First of all, the teacher participants in the project must demonstrate their passion for the better future. They must be committed to the idea of EDS. Passion and enthusiasm can be passed on easily from person to person. When we see someone who truly loves what they are doing or what they are talking about, it makes us want to become part of that. In Sweden, there is a common saying that "*Children do not do as you say, they do as you do*." This means, we educators, have to reflect on our own personal habits and actions related to sustainable behaviour and think whether we are actually creating sustainable behaviour for our students.

Secondly, to most effectively support our learners, we educators, need to consider our own knowledge, skills and values. In a report, *Learning for the Future*, produced for the United Nations Economic Commission for Europe (2011), the expert group, divides the competencies into the following[16]:

- ***Learning to know -*** It is important that we, educators understands the interrelation between the three pillars of sustainable society, that is, the ecological, the social and the economic and also the challenges facing society both locally and globally. The connection between a sustainable future and the way we live, think and work is very strong so understanding that connection will not only help us understand the root cause of unsustainable development but

16 Learning for the future, Competences in Education for Sustainable Development, United Nations Economic Commission for Europe (UNECE) Steering Committee on Education for Sustainable Development, 7 April 2011. for more detailed information and diagram, please check page 14 and 15.

also help us adjust our own thinking and action in relation to our role as educators.

- ***Learning to live together*** – It is important that we, educators are able to actively engage different groups irrespective of their age, culture and ethnicity. It is also important that we as educators can challenge unsustainable practices across the educational system and through dialogues encourage negotiations for an alternative future.

- ***Learning to do*** – We, educators, must be able to create opportunities for sharing ideas and experiences from different disciplines, places, cultures, generations without prejudice and preconceptions. We must be able to connect the learner to their local and global spheres of influence and help communicate a sense of urgency for change and inspire hope.

- ***Learning to be*** – We, educators, must be able to develop our own personal attributes and abilities to act with greater autonomy, judgement and personal responsibilities in relation to sustainable development and should be willing to take considered action in situations of uncertainty and be able to engage the learners to build positive relationships.

Finding sustainability in existing curricula

As mentioned earlier, one major obstacle, in teaching sustainability is "time". We, educators, have a mandated curriculum which is much larger than that which we can comfortably teach within an academic year. This leaves us with very little time to integrate knowledge from one course to another[17], let alone add new topics. Since most teachers treat ESD as a totally new topic they become reluctant to even consider the idea of including ESD in their courses. The Gotenburg Recommendations on Education for Sustainable Development tells us exactly the opposite. It says that,

> *"education for sustainable development should not be treated as a separate subject in the curriculum but rather a way of dealing with all the curriculum subjects. Involving more than content alone, it should encourage critical dialogue in the classroom by relating curriculum subjects to wider environmental, economic and social issues.[18]"*

If we educators take a second glance at the existing course curriculum we teach, we will realise that many topics fundamental to sustainability are already a part of it. It is just that we have not been able to identify them as yet. At the classroom level, we, teachers can begin by finding the link between the topic in the mandated syllabus and sustainability. *Education on Sustainable Development Sourcebook*, suggests that we look for the three pillars of sustainability-environmental, economic and social as well as themes connected to sustainability which are relevant to our local community or country. Identifying threads of sustainability in the subject we teach, will not only make our job easy but also help us guide our pupils to a more sustainable future. While reorienting our mandate curriculum, it is also important to remember that ESD is not merely the knowledge of environmental, social or economic issues. It helps address learning skills, builds

17 Education on Sustainable Development Source book, Learning and training toll No.4, ISBN 978-92-3-001063-8, UNESCO 2012. Further reference to this publication will be as Sourcebook and within brackets. For more concrete example of how to re-orientate your existing curriculum see chapter **Reorienting Curriculum to Address Sustainability.**

18 The Gotenburg Recommendations on Education for Sustainable Development, Chalmers University, https://document.chalmers.se/workspaces/chalmers/gmv/dokument-till-webben/esd-publication (assessed 29th Dec 2015). Furtherreference to this publication will be within brackets and as Gotenburg Recommendations.

perspectives and values of the society thus functioning as guidance and motivation in seeking a sustainable livelihood.[19] The Toolkit suggests that reorienting the curriculum should be at a balance between

> "*looking forward to a more sustainable society with looking back to traditional ecological knowledge. Indigenous traditions often carry with them the values and practices that embody sustainable resource use. While returning to indigenous lifestyles is not an option for the millions of urban dwellers, the values and major tenets of indigenous traditions can be adapted to life in the 21st century.*"

After having stated that, we have to point out that this doesn't mean adding more to the already full curriculum. On the contrary, by reorienting the curriculum and deciding what is out-of-date or does not contribute to sustainability and reworking the traditional approach to include contents relevant to everyday life, we will only make education more effective and lifelong.

Linking ESD with the mandate subject curriculum

Another way of integrating ESD into the mandate subject curriculum is to try and link between the topics. Global sustainability provides engaging context for teaching core subjects. It is also important to keep in mind that collaborating formal, informal and non-formal education will produce the best results (Gotenburg Recommendations).

Before continuing further, we would like inform that we do not want this part to be too prescriptive. Since subject curriculum for all countries within Europe are not exactly the same, this part should be treated as a guideline or ideas used in integrating ESD in core subjects. Teachers or Educators should therefore feel free to check their own subject curriculum and rework it. See also appendix for more ideas from the eight different partner schools.

Art: Integrating ESD to art is easy. Educators together with their students can use Art to communicate or express ESD message or issues that have application beyond the country's border. Intercultural understanding and mutual respect for other human beings can be taught in the form of art to students of all age groups. As we all know art encourages critical thinking and when this is combined with ESD the outcome can be remarkable. Students can, depending on their age, use handicraft techniques and tools as well as eco-friendly materials to explore, create and present different topics within ESD.

Workshops can be organised, where pupils create workbooks/ portfolios where they share their ideas, views, reflections and experiences in the form of drawings, paintings and even literature (cross-curriculum activity together with ESL, Mother- tongue education and even modern languages like French, German, Spanish, Italian, Russian, etc.).

Another idea is to create a "*trash to treasure*" exhibition, organise Christmas workshops of recycle material, etc. Depending on the age of the pupils, it is possible to organise drawing competitions where pupils draw the ecological footprints of things they use or eat, such as

19 Education on Sustainable Development Toolkit. U N E S C O, Education for Sustainable Development in Action Learning & Training Tools N°1, October 2006. Any reference to this publication will be within brackets and as Toolkit.

socks, mobile phones, hamburgers, etc.

It is also possible to create arts projects that highlight waste reduction themes via drama/theatres, music[20] and song-writing, digital art and animation, etc. with ESD as the theme can be arranged.

Music expressing sustainability problems/issues can be a part of the theatre/drama or even independence.[21] The lyrics of the songs can be written by the students or the music composed by inspiration from different cultural and national backgrounds.

Theatre-in-Education (formal version) and Drama-in-Education[22] (informal and often performed in the classrooms as role play) can be used as a teaching-learning tool for highlighting local and national sustainability issues. Students, depending on their age, can write the scripts of the play as a part of cross-curriculum activities in mother-tongue or other language lessons and later perform the play in the classroom or for the whole school and also for parents, school /local government authorities.[23]

In the younger age group, biology, general science and ESD can be demonstrated by creating a puppet booth with a "garden" setting and decorating the puppet booth with drawings of leaves, flowers and various insects, making simple stick, hand or glove puppets representing different insects. Group the puppets according to names, colours and sizes. Let these insects meet two at a time in the "garden" (puppet booth) to discuss their lives, similarities and differences.[24]

Another Puppetry arts/drama, science/biology and ESD idea is to have a "butterfly" and a "bee" meet in the puppet booth to discuss how they go about pollinating flowers. A "bee" puppet can discuss and demonstrate how he takes nectar from flowers to the hive to make honey and how that interaction with flowers contributes to pollination. Use "teacher-in-role" activities to provide answers to key questions in the puppet booth, e.g., students (using puppets) pose questions to the teacher-in-role (insect). A follow up exercise with the roles reversed, i.e., the students, assuming the "role" of insects, will answer the same questions posed earlier to the teacher. Use a sock puppet to explain how and why some insects live among plants. Use sock puppets to dramatize the "social" habits of insects, e.g., some live in colonies while others are solitary. Ask students to mimic typical movements (flying, hopping, crawling, creeping, etc.) of different insects to "bring them to life;" exaggerate movements for dramatic effect.

To combine drama/ puppetry with mother tongue education and ESD, Students can write a short story, poem or monologue from the perspective of their favourite insect. This activity could begin in the mother tongue classroom where different terminology is discussed and word lists are prepared.

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20 For more information on music and ESD, please *read Music Education as a Pillar to Sustainable Development in Nigeria* by Ogunrinade D O A. Journal of Economics and Sustainable Development.) ISN 2222-2855 (Online), Vol.6, No.3, 2015. 83

21 For examples and ideas, see The Green Songbook: 43 Songs Arranged for Beginning Guitar, Book and MP3 CD, by Jessica Baron, Alfred Publishing Company, 2011. ISBN 0739071211, 9780739071212

22 "Drama-in-Education", the term is acquired from http://steinhardt.nyu.edu/music/edtheatre/programs/dramaeducation (assessed 21st of June, 2016)

23 The idea of Eco drama is taken from http://www.teachingscotland.org.uk/education-in-scotland/primary-teaching/exclusive-eco-drama.aspx Recommended for further reading for interesting ideas and age classification. (assessed 21st of June, 2016)

24 The basic idea of puppetry and ESD is taken from the EAD's puppetry workshop video on https://www.youtube.com/watch?v=fsn0YiISWN0

As progress is made in assembling the original material, students are encouraged to transfer their work to the puppet booth or performance stage.

The ideas are many and it is up to the educators to help pupils use their fantasy to create.

Biology: Education of ecology as well as the Global Goals 14 and 15, can be made interesting by making recycle pet bottle terrarium. A workshop where pupils make fantasy animals from recyclable waste materials and taxonomic classification can be used to teach ecology and taxonomy[25].

Recycle plastic container bird feeders can be made and hung up in the school ground to study winter activity of birds in the area. One can also collaborate with the local university/ nature organisation to study the colour changes of the Autumn leaves in deciduous trees in different parts of the town, study the diversity of local deciduous trees like oak, maple, elm, etc. and trying to find out if and how climate change has affected it can make learning interesting and motivational.

Effects of hazardous substance in the water can be tested in practical lessons by trying to grow peas or other plants in contaminated water. To understand the effects of oil spills in the sea on birds and other animals and also to get some idea on the different sanitation methods, pupils can test oil spill experiments in the laboratory[26].

Examining photographs and drawings of a representative group of insects such as dragonfly, ant, dragonfly, beetle, cricket, bee and butterfly and if possible getting the young learners to visit the local University to see a collection of the actual samples of insects and comparing them with drawings/photographs can lead to active discussion in and outside the classroom. Photographs and illustrations can also be used to identify and discuss the main physical characteristics of insects, i.e., six legs, three main body parts (head, thorax, and abdomen).

A field trip to the local meadow and letting pupils become botany detectives with a mission of finding a particular plant from the picture or part of a picture or clues provided can also give more active learning.

Arrangements should be made for students to go out in the field to observe what they have learned in the classroom. This is important because these kinds of outings expose them to a real world perspective on the classroom-based subject, and provide an easily grasped context for their responsibilities as it pertains to sustaining the environment. For a project such as this, a trip to the botanical gardens or a nature walk where students can observe butterflies and bees at work pollinating flowering plants can be a wonderful starting point to deepen the discussion on the importance of sustainability when we change the environment in the name of human progress.

Chemistry: Teachers can, while teaching about chemical bonds, discuss how carbon's chemical structure is connected to global climate change (Church and Skelton) Global Goal 13. While teaching carbon cycle, one can link it to the ecological footprint of the shirt or the dress the pupil is wearing. This will bring up interesting

25 See Appendix for instructions on fantasy animal.

26 See Appendix for instructions on lab for oil spills.

discussion in the classroom encouraging pupils to participate.

One can work with Green chemistry both as theory and practical lessons[27] thus working with Global Goal 6, 7, 12 as well as chemical bonding, acid and bases. Topics such as health effect of common chemicals can be discussed under the title "a small dose of toxicology", Testing the quality of water to find out about local toxins in water, etc.

English as a second language (ESL): For example to be able to incorporate teaching of Global Goal 13 and 14 into the existing course curriculum in English, we can have storytelling in the classroom. Local traditional tale or an old Native American Indian creation story conveying sustainability ideas can be used in all levels of the school system. Storytelling is also an excellent way of preserving oral traditions of folk art. It is "*effective ESD pedagogy as the values reflected in traditional stories often contain the wisdom of the elders or stem from creation stories, which helps to impart respect for cultural heritage as well as the environment"*. (Sourcebook).

Films like *Erin Brockovich*, *Waterworld* or BBC documentaries such as *State of the Earth* by David Attenborough, TED talk videos such as *Yann Arthus-Bertrand captures fragile Earth in wide-angle*, Allan Savory's *How to green the world's deserts and reverse climate change*, etc. are a few receptive challenges for the pupils in a ESL class at secondary levels.

Productive skills can be enhanced by organising debates on topics like, "We in Sweden, should expand our nuclear power plants" and let the pupil debate for or against it. Pupils can also prepare a presentation or speech on different local sustainability topics such as local farmers' market, waste management in the town they live in, etc.

Classroom discussion can be encouraged using Global Goal 6: Clean water and sanitation, by putting two glasses of water in front of the class, one clean and one dirty and asking the class which one they would like to drink and why. This can later be expanded into writing essays on topics like Clean Water = Life. Receptive skills can be promoted by providing reading materials on cause of water scarcity in countries like India and China, water pollution crisis in Europe, Asia, etc.

General science: ESD and general science go hand in hand. Topics such as energy, environmental issues and climate change, impact of the modern life-style on the ecosystem, the viability of the ecosystem, the allocation of Earth's natural resource, the carbon-, the nitrogen-, and the water cycle are all a part of ESD.

Learners can easily understand these topics if they are focused on local and national problems. By getting learners to discuss and explore local societal issues, closer to home, they are given the opportunity to consolidate, deepen and develop their own knowledge for a life-long education. Global Goals 6, 7 can be highlighted by making field trips to the local sewage and water treatment plant, to the green energy plants such as hydropower plant or the wind power station, solar power plant, etc. Informal education in the form of field trips can give learners a better understanding than many text books.

27 http://www.beyondbenign.org/greenchemistry/greenchem.html (assessed 20th of Jan 2016)
https://www.uu.edu/books/GreenChemistryLabs/examplelabs.cfm (assessed 20th of Jan, 2016)

An excursion to the nearby beach or lake can give them some first-hand idea of the diversity of nature and the food-chain in that particular ecosystem, thus emphasising Global goal 14 and 15.

By collaborating with the local Universities, schools can invite graduate students and lecturers for seminars on local issues such as flood/ water logging, draught, forest resources, climate change, etc. (Global Goal 13). Movies like Wall-E, 2008 can be used to emphasise Global Goal 12 that is, responsible production and consumption. You tube's *Lesson from the past*[28] on the Easter island and *Lessons from Easter island* by Carl Lipo[29] on TED talk are interesting and controversial. These two videos can be useful in developing critical thinking as well as ESD in collaboration to ESL and general science.

Geography: Topics like global warming, burgeoning populations, unplanned urbanisation, logging of tropical forests, natural disasters, pollution, global carbon cycling, etc. can be easily integrated into the mandate curriculum.

To integrate Global Goal 6 to geography, one can begin with topics like global water cycle, global perspective of water sources on Earth, countries that have access to fresh water, etc. On a local level, visits to the local sewage plant can be useful to help pupils understand how used water has to be treated before it can be released into the nature.

Global Goal 7, renewable energy, can be incorporated into the mandate curriculum with topics such as Environmental consequences of different sources of energy, Politics of push on wind-farms, Blot on the landscape of wind plants, etc.

Global Goal 13 can easily be merged with mandate topics like physical relationships between glacier size, climate and climate change; how and why we use climate models to inform our understanding of the climate system, etc.

Global goal 12 can be discussed with topics like tensions and issues in food consumption, food as ecological and social intervention, etc.

History: Topics like World War II, can be used to discuss the unsustainable society and how war can prevent countries from making progress towards sustainability. (Sourcebook) Industrial Revolution can be used to discuss Global Goal 12 and responsible production and consumption.

History of water sanitation both on a national or local perspective can be used to discuss Global Goal 6. One can go even further and discuss topics like Indus Valley Civilization, from the 3000 BC and how the remains of the civilization show evidence of flush toilets and sewage systems.

28 https://www.youtube.com/watch?v=jYliCfzOkDE (viewed 21st June, 2016)

29 https://www.youtube.com/watch?v=kzV6_7PVMaI (viewed 21st June, 2016)

ICT: ICT can offer helpful tools in education for sustainable development. Data from experiments or investigations can be collected, shared and displayed by the whole class or group in e.g. Google docs. A collective spreadsheet in Google docs helps students to view each other's results from a collective data collection. ICT tools can also work as an easy way for digital storytelling, e.g. as a book made in Storybird, www.storybird.com or as a film made in Plotagon, www.plotagon.com. Students can in that way share their new knowledge or experiences with each other. A tool for an easy way to collect digital products made by several students and to collaborate in a group is to use a digital billboard in Padlet, www.padlet.com. To help students to get an overview of a complex subject area it can be a good idea to use concept maps or mind maps such as e.g. CMapTools, cmap.ihmc.us or http://drichard.org/mindmaps/.

Mathematics: Mathematics plays a big role in the education of sustainable development since it can be applied to all the three aspects that is social, environmental and economic. It's up to the educator to find a relevant topic. According to *Making Secondary mathematics sustainable*, a WWF school case study, the teachers involved in the project seem to believe "Mathematics is where Education for Sustainable Development meets the real world." They have come up with beautiful ideas of the "Oil Spills" and the "Population Explosion" projects for their pupils.[30].

Mathematics has an ancient history with contributions from many cultures. It is developed from both a practical need of human curiosity and desire to explore mathematics as such. Mathematical activity is by its nature a creative, reflective and problem-solving activity that is closely linked to the societal, social and technological developments. The human population on Earth is increasing every day and all these people need food, clean water, housing, energy, etc. etc. The demands on Earth's resources are high. Global Goal 6, 7, 12, 13, 14 and 15 can be easily incorporated into the mathematics curriculum. A few examples are where learners compare energy efficiency, pros/cons of green energy, calculation of how much water we need every day for drinking washing, bathing, etc. calculate CO_2 emissions with the help of footprint calculators, present and interpret the data of ecological footprint per capita, etc. Since knowledge of mathematics gives people the ability to make informed decisions in everyday life's many choices and increasing opportunities to participate in community decision-making will help young learners be more able to understand how to use Earth's resources in a clever way.

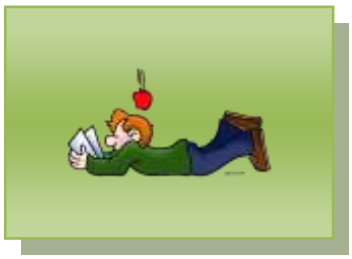
Modern languages: In modern language courses such as French, German, Spanish, Italian, Russian, Portuguese, etc. ESD topic areas such as French Revolution and associated politico-historical events and ideas, World War1, World War 2, the conflict between Christian and Saracen (the Crusades), etc. can be interesting as well as informative. Even social problems such as immigration, integration, legacies of colonialism; political activism, etc. can be used to discuss ESD.

Mother tongue: ESD discussion topics such as "Should I buy organic and locally produced products? Should I take the train or travel by car?" can be used to enhance critical thinking skills and the ability to communicate effectively (both orally and in writing)

Physics: Education for Sustainable Development has strong connection to physics. The ideal gas law as a model to describe the physics of the atmosphere, Orientation on how physical models and

30 Making Secondary mathematics sustainable, wwf.org.uk Assessed 27th Jan, 2016. See publication for the above mentioned example and ideas.

measurement methods used to make projections of climate and weather, applications of 'environmentally-friendly' power generation, physics within air and water in the environment and how a variety of phenomena arise from them, the principles of assembly and fabrication of nano materials, knowledge of inter- and intra-molecular forces involved in assembly, characterisation techniques and their application to functional nano materials, application of nano materials including the societal factors governing their use, The electronic properties of molecules, Radioactive decay, ionizing radiation, particle radiation, orientation of electromagnetic radiation and particle properties of light, the interaction of different types of radiation and biological systems, Radiation safety, and applications in medicine and technology, etc. are just a few topic areas.



Physical Education: The subject, physical education, can contribute to ESD by helping pupils to understand the importance of physical fitness and how proper physical activities, combined with healthy eating plate model can give them the opportunities to influence their own health and life.

Knowledge of the human physiology, need for physical fitness and active lifestyle, nutritious eating habits, etc. can help the society towards a greater social sustainability by reducing the risk for ”diseases of affluence”. There are studies suggesting that exercise, even in the form of a daily walk, can cure depression.[31]

Social Science: ESD is the natural ingredient of social science. Sustainability issues are a part of everyday classroom. It is not just about teaching democracy and practical application within the school and society, but also to about the different outcomes of democracy.

In order for everyone to express their opinion on the issues of sustainability, interclass debates can be organised where students stand for and against the topic, ESD debates in the cyber media where scientific evidence / facts are discussed and expressed is another form of teaching ESD in an informal classroom. This can form a good basis for cross curriculum teaching where subjects such as mother tongue, ESL and modern languages are concerned. Students can focus on the democratic right to be heard in public both orally and in writing not only in their own country but also internationally.

Students can research further and present sustainability issues such as environmental, political and economic conflict, their causes and impacts on the society, country and the world. Consumption is the biggest evil in the modern society. Understanding the effects of production and consumption (Global Goal 12) can lead to responsible young adults. Opportunities for cross-curriculum teaching with subjects like social science, history and geography can be effective. The consumption behaviour of the developed and the developing countries of the world and their ecological footprints can be discussed. The constant pursuit for economic growth by the companies can be used to help students understand the consequences and effect on the natural diversity in a geography or science /biology lesson. For example, the production and consumption of the ever popular, Nutella can in turn affect the natural habitat of Orangutan thus leading to their almost extinction[32].

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31 The Effect of Exercise on Depression, Anxiety and Other Mood States: A review. A. Byrne and D.G. Byrne. http://www.jpsychores.com/ Journal of Psychosematic Research, Volume 37, Issue 6, Pages 565–574 and ww.scientificamerican.com/article/regular-walking-can-help-ease-depression/ (both assessed on 20th of July, 2016)

32 www.telegraph.co.uk/foodanddrink/foodanddrinknews/11680458/Is-our-appetite-for-Nutella-destroying-the-

The effects of politics on the Global Goals for Sustainable development and its emergence can be an area itself of research and specialization for the students. The European Union and its involvement in the development of sustainability goals is an interesting area for further studies by the students at high school level. How is EU linked to sustainability goals? How does EU plan to achieve the Global Goals for sustainable development?

You can pick a Global Goal each and find out about the national / local perspective of just that particular goal, create a public exhibition together with other classes in the same school or other local schools. You can also make short information videos to show how to use social media to spread the message about what you can do on the local level making students realise how one as an individual can contribute.

ESD, physical education and social science can together contribute to an even bigger understanding of what makes people feel good. Does everyone have the opportunity to feel good? What must be done to feel good and why is it so important?

Whole School Approach to Education for Sustainable Development

As mentioned earlier, "children do not do as they are told, they do as we do."[33] For years, attempts have been made both in Sweden and England to get this concept to work thus getting the whole school to be involved in the education of sustainable development. To quote Håkan Writén, Secretary General, WWF Sweden, "*These schools are living and real-life example of how to develop the values, leaderships, teaching and other things connected with a school such school property, playgrounds, and immediate neighbourhood, under one umbrella"*[34]

According to the report, "*Sustainable schools – Schools working with sustainable development",* the responsibility of such a school, whose ambition is to equip individuals to cope with a sustainable future, is much more than that developing good teaching methods or serving an occasional vegetarian or organic lunch in the school lunch-room. The report states that "*in order to meet the challenges of the future, we must link an overarching approach to the school in a lifelong learning experience*" (*Sustainable schools*). It has therefore presented six developmental areas that strengthen the role schools play in sustainable development:

Core value and participation: Every school has its own goal and values but a successful implication of ESD can happen only if everyone is involved. A school consists not only of pedagogues but also of the administrative staff, the recreation leaders, the catering staff, the

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environment.html and www.cbsnews.com/news/french-minister-blames-nutella-for-growing-deforestation/ (assessed 20th of July, 2016)

33 Common Swedish proverb

34 **Sustainable schools - schools working with sustainable development**. *A report by WWF Sweden.* *http://www.wwf.se/utbildning-gammal/wwf-education/material/1409051-wwf-education-material* assessed, 29th of December 2015. Further reference to this publication will be within brackets and as *Sustainable schools*.

caretakers, the office staff, student assistants and only if all these people are engaged in the work for sustainable development, ESD is possible.

Management, structure and monitoring: In order to adopt a complete approach to ESD, it is essential that the school management is supportive and long-term in its behaviour. It is also important that there is a team which functions as the motor that moves things forward, keeping a check and monitoring development. The management should collaborate with this team and their representatives on a regular basis. "*It is essential that learning for sustainable development is a focused element of the school's normal work plans and development work and not a specific measure or something developed alongside other activities*."

Teaching and learning*:* Learning for sustainable development can be promoted by providing a stimulating learning environment that utilises a variety of pedagogical models, methods and strategies.

- *Emphasise and work with current events in the immediate environment.*
- *Use Information and Communication Technologies (ICT) as natural teaching materials.*
- *Work thematically and across subjects at all year levels.*
- *Learning for sustainable development is clearly visible in the school's curricula and schemes of work and in all subjects.*
- *Let the extended classroom be a natural part of your activities and make use of nature and society in your teaching.*
- *Teachers offer teaching models which focus on different conflicts of interest, both locally and globally.*

The pupil in focus**:** In school and in society, pupils often find themselves in situations where they have to make decisions. This is particularly true where learning of as sustainable development and the sustainable society is concerned. *In order to be able to make informed and considered choices pupils should be given the opportunity to act things out in real-life situations. The school can offer stimulating and challenging methods, environments, and forums where pupils are given the opportunity to both shape and develop their learning and influence their own learning process. This will help them acquire the sort of knowledge that promotes a sustainable future.*

Interaction with the community: *'Reality' for the pupils is not only found within the four walls of the school but exists outside in their environment and at home. Real meetings between people*
create understanding and insights into how the community outside the school works. This in turn creates opportunities for learning about sustainable development. By integrating various social functions with their schoolwork pupils prepare themselves for active citizenship and may also discover that it is possible to influence and change the things around them.

School estate and resource management: *A school is not just lessons and classrooms. Materials procurement, energy consumption, food purchases, repairs, etc., these are all part of working towards a sustainable future. The playground and the school surroundings are a stimulating environment where teachers and students can apply cross-disciplinary skills in projects that involve sustainable development issues. The outdoor pedagogy approach where you use as many of your senses as possible and experience things*

first hand is encouraged.
The purchase of materials, the way in which the school premises are used in terms of sustainability and the school's energy consumption should have a given place in school life. In short, our objective is to reduce ecological footprints.

There are two well-known options to a whole school approach:

Option A: The Eco-Schools Programme, which is a European wide education programme coordinated by the Foundation for Environmental Education (www.ecoschools.global/). Each country involved then has its own programme run by a lead organisation. In England it is www.eco-schools.org.uk The structure of Eco-Schools enables schools to not only learn about sustainability issues but then engage in practical activities and action in school through a simple coordinated framework.

Eco-Schools Framework, Process and Topics

The focus of this simple framework is the Eco-Committee or action team, comprising a representative sample of people from across the school community. There should be more pupils on the group than adults. For younger children a formal group like this might not be appropriate so their views and ideas should be gained from other participation techniques such as circle time or small group work.

This Eco-Committee drives forward the process in school and act as the conduit to share information with the wider school.

Schools should first undertake the environmental review (available from the Eco-Schools websites), this highlights key issues and opportunities for practical action in school. From here a simple action plan should be produced (templates available) which should highlight short term and longer term opportunities which should where possible involve the whole school community.

The Eco-Code is a statement of the schools' values. It can be a poem; song; rap; painting. It's up to the school to decide which format it should take.

Once schools have spent some time working through their action plan (perhaps six months as a minimum) schools can apply for an award. In the UK these include bronze; silver and then Green Flag (this may not be the case in all countries).

Below is a list for the eight project country contacts:

CZECH REPUBLIC TEREZA Educational Centre TEREZA, vzdelavaci centrum National Operator: Jan Smrcka Mail: ekoskola@terezanet.cz	ITALY FEE Italy FEE Italia National Operator: Andrea Rinelli Mail: a.rinelli@eco-schools.it	LITHUANIA Lithuanian Green Movement Lietuvos Zaliuju Judejimas National Operator: Renaldas Rimavicius Mail: blueflag@zalieji.lt
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SWEDEN Keep Sweden Tidy Foundation Stiftelsen Håll Sverige Rent National Operator: Lisa Adelsköld Mail: lisa.adelskold@hsr.se	ENGLAND Keep Britain Tidy National Operator: Morgan Phillips Mail: Morgan.Phillips@keepbritaintidy.org www.eco-schools.org.uk	

Option B – the Sustainable Schools Framework (developed by English Department for Education 2006). This framework which continues to be supported in the UK by the Sustainable Schools Alliance (http://sustainable-schools-alliance.org.uk/) See link above for more details.

On the path towards a sustainable society:

In this paper, we, the eight project countries, have made an effort to illustrate how schools can contribute to a sustainable future in the form of formal and non-formal education. Our purpose was also to, through education, increase students' commitment to want to be involved in creating a sustainable future.

In the beginning of the paper, we emphasised the importance and the need for a sustainable society and how education is the only solution. We need a society that is ecologically, socially and economically sustainable. How this can be defined is exemplified in this part of the paper.

The paper also highlights and discusses the obstacles on the path of education for sustainable development in our schools. One such obstacle is, the educator's lack of time as the mandate curriculum and syllabus goals have to be met, and that there isn't enough time to work on issues of sustainable development. We therefore, through the guidelines, tried to illustrate that education for sustainable development can be carried out hand in hand to the schools' mandate curriculum and the goals of the course syllabus without additional burden on an already stressful school life.

As observed, the school curriculum for all the project countries, focus on the need for development in the student´s ability to problem-solve, increasing creative curiosity and developing a willingness to try their own ideas. It is evident, that education for sustainable development provides all this and much more. This is why, in the guideline, we tried to bridge the school curriculum and course syllabus with six thematic areas of the UN's Global Goal for sustainability. This was done by investigating to what extent the mandate subjects we worked with include parts that coincide with the UN's goals.

Finally, we tried to provide more concrete examples from each project country on how to work across curriculum to achieve the selected UN goals. To make it easier for the members, we also took up the topic on "whole school approach to ESD" and provided information and contact emails to the local eco-schools authorities.

In conclusion, we do hope that we have managed to shed a little light on the path towards education for sustainable development.

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Appendix 1

Fantasy Animal

As you all know you have been asked to take anything you find at home which you no longer use. Today you are going to reuse these materials to make something creative as well as learn and understand how animals live in their environment and adapt to their surroundings.

Subject: Biology/ Natural science and art

Groups: Max 3 person/group

Material necessary:

- Glue
- Scissors or something to cut your materials
- Bag with recycle (recycling) material that you have taken from home
- Paper and pen

Instructions:

Fantasize an animal and then build it with the recycle material you have in your bag. Remember that while creating this fantasy animal, there are certain important things that you have to in your mind for example what are the qualities important for this animal to survival in the wilds.

1. Take into account of its habitat. In other words, where does this animal live?

2. Consider also how the animal

- moves
- protects / defends itself against its enemy
- survives in different climate, temperatures
- where does it build its nest/ home
- how does it multiply in population and take care of its offspring

3. You must also try and provide a biological name of the animal.

Appendix 2

Effects of Oil spills in the sea and other water source

As you all know, we have been discussing the effects of oil spills in the sea and other water sources in your lesson. Today you are going to try out the experiment on your own. Remember to proceed slowly and carefully and try and reflect after every part. Answer also the question/questions after your observation.

Subject: Biology/ Natural science

Groups: Max 2 person per group

Material necessary: You will need a glass or a plastic bowl, a plastic spoon, some bird feathers, paper towels, tap water, cooking oil such as Olive oil, raps or sunflower oil, calcium oxide, liquid soap, a bunch of hay or dry moss, a rubber or plastic ring.

Step1: Fill the bowl with water from the tap to the half. Add a bird feather on to the water. What happens to the feather? Does it float or sink?

Step 2: Pick up the feather from the water and then add about 20 drops of oil to the water. Release the droplets together to form a continuous oil slick on the water. Now add the feather as close to the oil slick, and if needed move it towards the stain with a plastic spoon. What happens to the feather now? Does it look as it was from the beginning? Why?

Step 3: Take up the feather and place it on a paper towel. Put another 20 drops of oil so that a new slick is formed. Take a rubber / plastic ring and put it carefully on the stain. What happens to the stain?

Remove the rubber / plastic ring carefully with a clean spoon. If oil spills at sea is not so big, one can use large rubber rings to capture the oil without causing major damage to the environment. The process is called mechanical clean-up of oil spills.

Step 4: Add 20 more drops of oil. Take a little hay /dry moss and put it on the stain. What happens?

Natural materials like hay or dry plants can also be used for mechanical clean-up of oil spills in the

water source without damaging the environment.

Step 5: Replace the water and wash off the oil from the bowl before replacing it with fresh water from the tap. Now fix a new slick with 20 new drops of oil. Take a teaspoon of calcium oxide (CaO) and sprinkle it on the stain. (Chemical clean-up process)

Where are the oil slicks?

What are the effects of a chemical clean-up like this on the fauna and the flora on the seabed?

6) Fixing a new oil slick on the water by dropping another 20 drops more of oil. Now pour 20 drops of liquid soap on to the oil slick (The method is called dispersion)

- What happens to the oil?

Detergents dispersed the oil slicks by breaking them up into finer fragments but they still exist in the water.

7) Now try to wash the feather with soap. How do you manage it?

8) Can you now describe why the birds that come in contact with oil in the sea or other water sources have it so difficult to survive?

9) Wash off the bowl. Notice how difficult it is to remove the oil from the bowl. Remember that the oil you are using is vegetable oil. How difficult will it be if it had been crude oil which is several times thicker than the cooking oil?

Answer all the questions and write your name on the paper and hand it to me. :) :) :)

Remember that everything should be NEAT AND TIDY BEFORE YOU LEAVE THE CLASSROOM.

Appendix 3

UK_ Curriculum grid
Curriculum Opportunities

These are example suggestions, to identify potential progression for pupils.
It is difficult to compare qualifications across countries. To help with this the EU has developed the European Qualifications Framework (EQF) to help people to be able to study and work across the European Union. More information from:
http://ec.europa.eu/ploteus/en/search/site/?f[0]=im_field_entity_type%3A97&f[1]=im_field_eqf_level%3A111
Rich Hurst, Education Development Advisor – Sustainability Education
January 2016

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	9-11	• How is water cleaned for human consumption? • If humans drink dirty water, what can happen?	Science Geography PSHE
	11-14	• Audit how much water you use over the course of a typical school day for eating; drinking and washing as a homework activity.	Maths
	14-16	• Research conflicts over access to water. Present a report detailing your findings.	Geography
	16-18	• Is the problem in Africa physical water scarcity or economic water scarcity? • Research and identify strategies that have been put in place to increase access to safe water and sanitation sustainably. Assess the success of these strategies.	Geography ICT Economics
Global Goal 7 – Renewable Energy	9-11	• What is renewable energy? • How does it differ from fossil fuel produced energy? • Make your own wind turbine and test it.	Science STEM PSHE
	11-14	• Is renewable energy the answer to our long term energy needs?	STEM Science

		• What are likely to be the next big improvements in renewable technology?	
	14-16	• Identify career opportunities within the renewable energy sector across the world • Map investment in renewable energy around the world	Careers education Geography
	16-18	• Can the industrialisation of Africa be achieved through renewable energy sources? Discuss. • What are the opportunities for European countries to collaborate and join together their supplies of electricity? What benefits could this achieve? Present your ideas.	Science STEM Geography
Global Goal 12 – Responsible Consumption	9-11	• What things do we waste? • Why do we waste stuff? • Whose responsibility is it to deal with waste?	Geography PSHE
	11-14	• Is the human race addicted to shopping? Discuss.	English Citizenship
	14-16	• Research the concept of a circular economy. How does this differ from how most goods are produced? • What could be the economic/ social and environmental benefits of changing our global models of production?	Design and technology Geography
	16-18	• Is fair trade the answer to unsustainable consumption? Assess the impact of fair trade and suggest alternative methods around sustainable resource consumption.	Geography Citizenship
Global Goal 13 – Climate Action	9-11	• Investigate different weather patterns across Europe and the world • Investigate the main causes and impacts of man-made climate change	Geography PSHE
	11-14	• Investigate climate change mitigation	Science Geography Citizenship

		• What does this mean? • Investigate the main outcomes of the COP21 summit in Paris in 2015.	
	14-16	• Investigate climate change resilience projects around the world • Research recent flooding/ heat events in your country. What are costs (economic/ social and environmental) of climate inaction?	Science Geography Citizenship
	16-18	• Investigate how the range of increased temperatures will impact across a variety of eco-systems around the world. How will these variations impact upon the economy, society and the environment? • How does a country or a regions economic capacity impact upon their ability to be resilient?	Geography Economics Science
Global Goal 14 – Life below water	9-11	• Visit a coastal community and use it as for a comparison local study. • Alternatively visit a beach and undertake some Beach School sessions. • Research how the sea and coastline impacts on all our lives	Geography Science PSHE
	11-14	• Investigate the impact of commercial fishing and illegal fishing on fish stocks and the general wellbeing of the oceans • What measures are been taken to replenish fish stocks	Geography Science Citizenship
	14-16	• Investigate an example of marine pollution from around the world. • What was its impact on the local environment and further afield?	Geography Science Citizenship
	16-18	• Can the oceans feed the world? Present a report on whether sustainable fishing is the answer to feeding the worlds increasing population. Investigate the 'Blue	Geography Science Literacy ICT

		Revolution' is this the answer?	
Global Goal 15 – Life on land	9-11	• Adopt outdoor learning approaches (eg. Forest Schools; Food and Growing experiences) to help pupils establish an appreciation of the natural world both aesthetically and its wealth of resources • Establish an after school growing club with parents/ local volunteers • Introduce simple systems thinking (eco-systems; societal systems)	Science Geography Personal, social and health education (PSHE)
	11-14	• Research the issue of deforestation around the world and the impact on soil, air quality and animals. • Investigate organising a tree planting scheme in your local community	Geography Science Citizenship
	14-16	• Eco-foot printing. How many equivalent hectares of land are required by people from a number of different countries around the world • How can people reduce their footprint? • Identify the impact of species loss since the industrial revolution across Europe. What measures are being taken to reverse this trend?	Maths Science Geography Citizenship
	16-18	• Undertake fieldwork to identify land use in their local area and produce a report detailing how land is being used and how it could be made more sustainable • Research land use in the past and undertake a comparison • Predict future use to ensure environmental degradation is minimised and ideally enhanced	Geography Maths Science Literacy Communication ICT

Appendix 4

Sweden_ Curriculum grid

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	16-19	• Emissions	Science/Chemistry
	16-19	• Acidification in the ocean (acid and base)	Science/Chemistry
	16-19	• Research conflicts over access to water. Present a report detailing your findings.	Geography
	16-19	• Is the problem in Africa physical water scarcity or economic water scarcity? • Research and identify strategies that have been put in place to increase access to safe water and sanitation sustainably. Assess the success of these strategies.	Geography ICT Economics
Global Goal 7 – Renewable Energy	16-19	• Climate and meteorology	Science/Chemistry
	16-19	• Replacement of fossil fuel with bio fuel	Science/Chemistry
	16-19	• Building a model of a sustainable city	Geography
	16-18	• Participation in thematic activities about sustainable development	All subjects
	16-19	• The meaning of the concept sustainable development	Geography
	16-19	• Electrochemistry – fuel cell technology	Science/Chemistry
Global Goal 12 – Responsible Consumption	16-19	• Recycling	Science/Chemistry
	16-19	• Practising outdoor life and discussion of how to behave in nature • Take nothing but pictures, leave nothing but footprints	Physical training
Global Goal 13 – Climate Action	16-19	• Emissions	Science/Chemistry

	16-19	• Texts with content about sustainable development • Collaboration in language and science • Terminology: practice in reading texts about sustainability in English and Swedish.	Mother tongue English Science
	16-19	• Working on the concept of sustainable development	Geography
Global Goal 14 – Life below water	16-19	• Texts with content about sustainable development • Collaboration in language and science • Terminology: practice in reading texts about sustainability in English and Swedish.	Mother tongue English Science
	16-19	• Acidification in the ocean (acid and base)	Science/Chemistry
	16-19	• Foreign species in the oceans	Biology
Global Goal 15 – Life on land	16-19	• Texts with content about sustainable development • Collaboration in language and science • Terminology: practice in reading texts about sustainability in English and Swedish.	Mother tongue English Science
	16-19	• Sustainable forestry	Biology
	16-19	• The important role of predators in the eco-system	Biology
	16-19	• Undertake fieldwork to show different environmental problems	Biology
	16-19	• Treat the concepts of endocrine disruptors, DDT, PCB, flame retardants, CFCs when working with organic chemistry and chlorinated substances	Science/Chemistry

Appendix 5

Romania_ Curriculum grid

Curriculum Opportunities

These are example suggestions, to identify potential progression for pupils.

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	12-14	• What are the main components of an installation of water supply? • What are the sources of clean water? • What are the main characteristics of the methods used for treating and filtering water?	Physics
	11 – 14 14 – 16 16 – 18	• Debate: the enemies of water: pollution and waste	Art
	11-14	• Sea water can become a source of drinking water – what do you know about the water's demineralisation?	Native Language
Global Goal 7 – Renewable Energy	12-18	• The main sources of renewable energy; • The advantages and disadvantages of using each of the sources used; • The situation of Romania regarding the sources of energy.	Physics
	11 – 14 14 – 16 16 – 18	• Creating a universal centre to collect waste from our homes • Keeping an optimal temperature in our homes	Art
	11-14	• Is the thermic isolation of the house a solution for energy reduction? What pieces of information do you have about high-grade windows which reduce the energy losses from the households?	Native Language
Global Goal 12 – Responsible Consumption	11 – 14 14 – 16 16 – 18	• Choose local products! • When possible buy products which can be reused.	Art
	9-11	• How are you thinking about educating your family concerning the excessive consumption of processed aliments? (Nationality)	Native Language
	12-18	• Underlining the reasons why people should consume products responsibly ;	Physics

		• Methods of decreasing the consumption of energy at home and at school;	
Global Goal 13 – Climate Action	14-18	• Understanding the relationship between human activities and climate change. • Which are the most powerful sources of pollution? • Which are the ways in which gas emissions can be reduced?	Physics
	11 – 14 14 – 16 16 – 18	• Knowing that people are responsible for gas emissions, how can we reduce them? • Collaborate with independent international organisations which use creative non-violent confrontation to adopt solutions for a green future.	Art
Global Goal 14 – Life below water	14-16	• Which are the physical parameters specific to life below water (water density, temperature, the intensity of light? • Which are the basic chemical and physical conditions which water has to have in order to maintain and develop life?	Physics
	11 - 14	• Clean water – posters	Art
	14-16	• How can you protect the environment from the sewage which is leaked in the rivers?	Native Language
Global Goal 15 – Life on land	14-16	• Which are the physical parameters specific to life on land (density, temperature, the intensity of light? • Which are the basic chemical and physical conditions which air has to have in order to maintain and develop life?	Physics
	11 – 14 15 - 18	• Choose an area we wish to clean and create a partnership with a local environmental agency. Select students and create a team and clean the area we have chosen.	Art
	11-14	• Make a project/study on the involvement of the urban community in the growth of the green areas through the use of the flats' roofs terraces.	Native Language

Appendix 6

Czech Republic_Curriculum grid

These are example suggestions, to identify potential progression for pupils.

Global Goal	Age Range	Opportunities	Subject
Global Goal 6 – Clean water and sanitation	12-15	• Students calculate the amount of water that they use per day.	Maths
	12-13	• Water and Air - students discuss the issues such as pollution, the greenhouse effect, water consumption, environment and society, light pollution and global warming/ climate change • Students prepare a leaflet focussing on the promotion and need to save water, highlighting the fact that there is a lack of clean drinking water in many parts of the world.	Geography Art
	12-16	• Module Water as a part of the La Ngonpo Project. • Students do various activities connected with world "water issues" - water consumption, sea pollution. • List of some used methods: • Diamond, I.N.S.E.R.T. , creating a model, quiz, research. • See attached methodology.	English Social science?
	12 - 16	• Enzymes and bacteria helping to clean water •	Biology
	12 - 16	• Clean and dirty water - species diversity	Biology
	12 - 16	• Possible ways of filtrating water	Chemistry
	14-15 (grade 9)	• Water consumption: • 1. Find out what is your average water consumption per day by calculating last three days. • 2. Find out what is the average world/Czech consumption per person and compare with your own. • 3. Find out what country has the highest water consumption and which is the lowest. Discuss the reasons. • 4. Are there any ways you could reduce your water consumption? List them. • Calculating Carbon Footprint • http://www.carbonfootprint.com/ • and analyze of results •	Geography

		• Virtual Water • Create a Power Point™ slide show that presents how much water it takes to produce specific consumer goods, such as cars, houses, as well as food, such as a half-pound hamburger or a loaf of bread. • http://www.onewater.org/education/curriculum/ch5 •	
Global Goal 7 – Renewable Energy	14 - 16	• Cellular respiration compared with manmade sources of energy	Biology
	14 - 16	• Redox reactions, possible sources of energy? Enthalpy and exothermic reactions	Chemistry
Global Goal 12 – Responsible Consumption	12-15	• Students write a project with the local municipality authorities about a possible solution to decrease the amount of waste from households, public buildings and industrial businesses.	English
	12 -16	• Food intake/waste	Biology
	12 - 16	• Biodegradable plastics	Chemistry
Global Goal 13 – Climate Action	15 - 18	• Climate Action - Students actively participate in a solution for air pollution caused by local houses. Based on their acquired knowledge, they explain to locals how to change their behaviour in order not to harm the environment so much. Requires (technical) knowledge of the problems and also strong communication skills.	Social Sciences
Global Goal 14 – Life below water	12-16	• Students suggest possible solutions to the problem of plastic waste in the sea and what they could do about it themselves. They compare the effectiveness of suggested solutions and • create a “Plastic Sea“.	Art
	11-14	• Environmental issues and species diversity changes	Biology
Global Goal 15 – Life on land	12 - 16	• Environmental issues and species diversity changes	Biology
Other goals	16 - 18	• Semester project on environmental issues in Spanish speaking countries: students collect newspaper articles, videos, statistics and other sources on current environmental topics during three months, create a handbook and present the content in class including their own reflection and possible solutions - this will be a base for a whole class discussion.	Spanish
	15-18	• Students discuss different decisions in history that led to worsening of environment and suggest solutions to these problems.	History
	15-18	• Students role play a situation of an investor who wants to start a big commercial project in their village. Each has a different role (mayor, inhabitants for and against) and they discuss all possible solutions and suggestions.	Foreign language

Appendix 7

Italy_ Curriculum grid

These are example suggestions, to identify potential progression for pupils.

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	14-15	• Watching of the short film "Water" made by primary school pupils "Chiarelli" in Martina Franca; • Find words related to water • Processing of film sheet • Individual research and group work on the theme "I and the others"	Citizenship ICT Italian English German History
	14-16	• Each Student has to create a “take actions – save water”; • Show their PowerPoint presentation and share their Take Action statements with other students in the classrooms. • The purpose of this activity is to empower students to effect positive change. We can all make a significant difference in water conservation and protection of water sources if we are mindful of our daily activities and choices.	Science ICT Graphics
	16-18	• Teach students how to read a Water Quality Report. • Reports the sources of drinking water. • What contaminants, if any, are in the drinking water, and how these materials could effect health? • Each student receives a copy of the water quality report and in groups they make a PowerPoint presentation with the information. • At the end they show their PowerPoint presentation and discuss the findings with the class.	Science ICT Chemistry
	14-18	• Watch a documentary about a typical day in a village of Africa. Students are asked to answer the following questions: • Did you know life conditions of people in Africa and that water is a problem for them? Brainstorm and discuss these problems and possible solutions.	German English Geography

	14-18	• How do we get drinking water? What process does water go through to become safe enough to drink? Find out with the help of internet and make a presentation of the results.	Science Geography Chemistry ICT
Global Goal 7 – Renewable Energy	17-19	• Analysis of the practices currently adopted for the management of the electrical system of your school; • Students have to find ways to save electrical energy in school; • Students have to share their proposals with the entire school population Start the energy saving actions	Italian Science Physics
	16-18	• Research the use of the renewable energies, in some European countries; • describe the benefits and problems involved in their use; • Produce a final PowerPoint presentation to show the results of this research in different languages	Physics Science Geography ICT English German
	16-19	• Energy and the conservation of it: • There are ways to save both energy and money; • Proper insulation, light bulbs, and adjusting temperature gauges are a few examples of how we can all be energy efficient and keep some more money in our pockets. • Creation of a leaflet to invite people to save energy with right behaviour; • Translation of the leaflet into different languages. • Distribution of the leaflet in school, family and community	Science Physics Graphics ICT English German
	14-15	• Research of Keywords regarding renewable energies; • creation of a multilingual dictionary on sustainable energy: Solar, wind, geothermal, hydroelectric, renewable energy, biomass, fuel cell, gasoline alternatives, alternative energy, conservation, environmental science ...	Science Physics English German
	16-18	• You are an environmentalist in the field of renewable energy. You have to research renewable energy resources such as: • Solar Energy • Energy from biomass • Geothermal energy • Energy from flowing water • Wind energy	Physics Science Geography ICT

		• Wave energy and tidal energy • Ocean thermal energy • Your mission is to plan and decide which from above can be implemented in your region. You have to convince the community which energy can be used to replace non-renewable energy resources.	
	17-18	• After reading about clean and renewable energy, students are asked to search the internet to find if in Puglia there are plants for renewable energy. They have to write a short report with their considerations.	English Germany Science
Global Goal 12 – Responsible Consumption	14 - 16	• Web search to understand the importance of a sustainable future, - exploring the different things that can be done on a day to day basis to help ensure that our future is a safe clean one. • Educate children on what things they can do every day to help out the planet. • At the end produce slogans in different languages to promote these actions.	Citizenship ICT Italian English German
	18-19	• Choose a company that incorporates environmental responsible practices into their business and complete the following: • Provide a brief overview of the company and their business. Describe these practices and how they help the environment. • Describe how these practices help the company in costs, image, employee and customer morale? • Express personal thoughts: can the company do more/less? • Create a PowerPoint or poster based on the findings.	Economics Geography ICT Law
	14-18	• Organise an advertising campaign about the four R's : Reduce, Reuse, Recycle, Energy Recovery • Respect the environment, keep trying to improve it pointing out that it is a human heritage; • Be aware of having rights and duties for the qualitative development of civil society	Italian German English Citizenship Science Physics ICT Graphics
	14-18	• You have been commissioned by the Principal to develop a prototype for combating the issue of waste in your	Italian German English

		school. • As your schools environmental focus for the year is sustainability, your prototype will need to incorporate a sustainable, reuse, recycle focus.	Citizenship Science Physics ICT Graphics
	14-15	• Food History and Geography (Lessons held by geography teachers, English, German and religion teachers) • Lessons of science and technical teachers on food ingredients, food preservation techniques, food digestion, chemical power, eating disease	Italian German English Religion Science Chemistry
	14-16	• Control of the light bills, gas and water • Change of life styles, saving energy and water for 3 months, • Rechecking of consumption • Calculation of cost saving	Science Economy
Global Goal 13 – Climate Action	14-18	• Organisation of a school wide t-shirt decorating contest for Earth day; • Each class have to decorate a t-shirt for Earth day; • Organisation of a school assembly, where the whole school attends. 1 student from each class to be chosen to be a "model" to wear the class made t-shirt. • Photograph and document the event • At the end, create a poster with the photos of all the t-shirts	Graphics ICT photography
	16-18	• Climate Change can be attributed to both natural and man-made activities. • Students will identify indicators of climate change and document research that supports or negates significant change. • Students will summarize research reports. students will present their research in a poster session • They evaluate the effects of climate change	Geography Science ICT Physics
	16-17	• Read an article about floods in some regions in Italy. Students have to discuss climate changes in their country and in their town and investigate how their behaviour could do something to make things better.	English Germany Geography
	16-18	• Students have to imagine being an Energy Expert: they have to explore in groups of four how we get energy for	

		transportation and electricity and learn how energy use impacts the climate.	
	16-18	• Think about a disaster that you have personally experienced one that happened in your country or one that you closely followed in the news. Briefly describe the disaster, what happened after the disaster, and how you felt about it.	
Global Goal 14 – Life below water	14-16	• Watch a cartoon about underwater life. Students have to answer the following questions: • Do you think that seas and rivers are still pristine? Search the internet for pictures about this topic and put them in a PowerPoint presentation.	
	14-16	• Presentation of the animals of the Mar Piccolo of Taranto • Creation of grids, questionnaires, drawings, photos, reports, • Visit of the Thalassographic Institute of Taranto	ICT Italian English German Geography Science Graphic
	16-18	• Visit the Institute for Coastal Marine Environment of the National Research Council (IAMC-CNR), composed of six departments and a marine biology laboratory, it traditionally deals with issues related to marine sciences, and in particular in the domains of biology, chemistry, physics, geology, studies on renewable resources (fishing and aquaculture) and on marine technologies. • Produce a report in a PowerPoint presentation of the visit with photos • Create a leaflet for tourists by the students of the tourism section in different languages; • With designs by students of graphic section	ICT English German Geography Science Graphic
	14-18	• Participation in a clean-up day on the beach; • Photographic documentation of the event; • Compilation of a table detailing the most common trash found on the beaches; • Produce a PowerPoint presentation of the whole work; • Disseminate the results in the school community	Science physical education ICT Geography photography

Global Goal 15 – Life on land	14-16	• Students will take a walk through a neighbourhood, park, or nature reserve and observe the native animals and their behaviours. This activity is followed by a class discussion about their observations, a report and a PowerPoint presentation about the argument.	Science Geography ICT
	14-16	• Creation of an Illustrated Nature Calendar of Life on land: insects, trees, birds, wild animals, pets, and flowers; • Keep one calendar for the classroom and present the others to the office staff and other classes	Geography Science Citizenship
	14-18	• Introduce students to the concept of organic farming. Discuss the benefits of this process for humans, for the land and living creatures where this farming takes place. After that organise a field trip to a local organic farm. At the end produce a PowerPoint presentation about the argument	Maths Science Geography Citizenship
	14-16	• Organisation of an Ecological Picnic on land with products without packaging. • Students have to think more critically about what they eat, where it comes from, and who grew it. • At school they have to make a list of the food they used during this picnic	

Appendix 8

Lithuania_ Curriculum grid

These are example suggestions, to identify potential progression for pupils.

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	13-14	• Exploration of "Nitrates in water from a well"	Biology
	11-12	• Recycling of Rubbish • Cheap and Expensive Water	
	12-13	• Trees grow for many years	
	13-14	• Talking about Illnesses	English
	14-15	• Drinking Water • Making Leaflets "How Green are you?"	
	15-16	• Research of chemical reactions of water.	Chemistry
	7-11	• How can we help our planet?	Primary classes
Global Goal 7 – Renewable Energy	12-13	• From Hydro – electric till Rosette	Biology
	14-15	• Ecology and Eco systems	
	16-17	• Production and Transfer of Electrician Energy	Physics
	13-14	• Let's save Electric Energy	
	16-17	• Global Problems	
	7-11	• How can we help our planet?	Primary classes
Global Goal 12 – Responsible Consumption	11-12	• Cheap and Expensive Water	Biology
	12-13	• From Hydro – electric till Rosette	
	16-17	• Production and Transfer of Electric Energy	Physics
	13-14	• Let's save Electric Energy	
	16-17	• Radioactivity- what do we know about Chernobyl accident?	
	12-13	• Pollution in big cities • A leaflet giving advice (pollution)	English
	14-15	• Making Leaflets "How Green are you?"	
	11-17	• A Letter to the Earth	
	15-16	• Use and Pollution of Water • Positive and Negative human's influence to Nature	Geography
	14-15	• Natural and man made substances, their advantages and disadvantages	Chemistry
	16-17	• Industry influence on nature	
	14-15	• Ancient Lithuanians love of forests	Lithuanian
	16-17	• Global Problems	History
	14-15	• How to lessen Pollution of Water	

		and Soil	
	7-11	• What can I do to save Earth? • Trees. Why do we need them? • Lakes and rivers • Why we have to sort rubbish • How can we help our planet?	Primary classes
Global Goal 13 – Climate Action	11-12	• Green our World	Biology
	14-15	• Ecology and Eco systems	
	15-16	• Ecological Problems	Physics
	16-17	• Radioactivity- what do we know about Chernobyl accident?	
	12-13	• Pollution in big cities • Times Change. Then and Now	English
	14-15	• Our Precious Planet	
	11-17	• A Letter to the Earth	
	12-13	• Our Nature – our World	Geography
	15-16	• Use and Pollution of Water • Positive and Negative human‘s influence to Nature	
	14-15	• Natural and man made substances, their advantages and disadvantages • Changes of Climate and the Ozone layer	Chemistry
	16-17	• Industry influence on nature	
	11-12	• Why people can‘t burn dry grass	Lithuanian
	16-17	• Global Problems	History
	7-11	• Why we have to sort rubbish	
		• What pollutes the environment?	
		• Why Earth is called “Blue Planet“?	
Global Goal 14 – Life below water	16-17	• Problems of the Planet	English
	11-12	• Animals in the World	
	12-13	• A leaflet giving advice (pollution)	
	14-15	• Our Precious Planet	
		• Animals in Danger. Endangered Species	
		• Discussion: „To save Nature – it means...“	
	15-16	• Ecosystem of Baltic Sea and Kursiu Neija	Geography
	12-13	• Our Nature – our World	
	15-16	• Positive and Negative human‘s influence to Nature	
	14-15	• Our love of Nature	Lithuanian
	11-12	• Lithuanian and International “Red Book“	
	7-11	• Lakes and rivers	
		• Why Earth is called “Blue Planet“?	
Global Goal 15 – Life on land	11-12	• Green our World	Biology
		• Recycling of Rubbish	

	12-13	• Trees grow for many years	
	14-15	• Pollution of Environment	
	16 -17	• Pollution of Atmosphere	
		• Problems of the Planet	English
	9-10	• Ours school park	
	11-12	• Animals in the World	
	13-14	• Talking about Illnesses	
	12-13	• Times Change. Then and Now	
		• A leaflet giving advice (pollution)	
	14-15	• Our Precious Planet	
		• Animal in Danger. Endangered Species	
		• Discussion: ”To save Nature – it means...“	
		• Pollution of Water	Geography
	15-16	• Ecosystem of Baltic Sea and Kursiu Neija	
		• Positive and Negative human‘s influence on Nature	
	11-12	• Why people can‘t burn dry grass • Lithuanian and International ”Red Book“	Lithuanian
	14-15	• Our love of Nature • Ancient Lithuanians love to forests	
	7-11	• Trees. Why we need them? • Animals around us	Primary classes
Other goals	11-12	• Green our World (goal 16)	Biology

Appendix 9

Portugal_ Curriculum grid

These are example suggestions, to identify potential progression for pupils.

Global Goal	Age Range	Opportunities	Subject Links
Global Goal 6 – Clean water and sanitation	15-18	• Volunteer campaign for a cleaner environment (e.g. clean-up days).	Religion
	15-18	• School trip to a water and solid waste treatment plant and creating interactive reports on the experience/knowledge learnt	Natural sciences Biology ICT English language
	15-18	• Physics and Chemistry lab experiments such as "Cleaning water", "Filtering water" "Turning salt water into sweet water", "Extracting water from desert sand", among others	Physics and Chemistry
	15-18	• Creating info graphics on global water shortage and global access to water and sanitation.	Geography ICT Maths
	15-18	• Timeline on the development of the water supply system and/or sanitation system in our hometown/country.	History ICT
Global Goal 7 – Renewable Energy	15-18	• Lab experiments within the topic, for example on preparing biodiesel, using light to heat water, etc.	Science Physics and Chemistry
		• Web quest about the pros and cons of renewable energies and making whiteboard video animations on the topic.	ICT English language
Global Goal 12 – Responsible Consumption	15-18	• Analysing the impact of fashion on the environment. Researching about as well as promoting sustainable, eco-friendly and ethical fashion. • Recycled materials Fashion Show	Fashion Design (Arts)
	15-18	• The environmental costs of globalisation; the responsibilities of individuals, corporate organisations and governments in promoting sustainable development; the conflicts of interests in dealing with globalisation and environmental issues; the importance of tackling global problems through international cooperation.	Biology Geography
Global Goal 13 – Climate Action	15-18	• Calculating the ecological footprint of our high school students.	ICT Maths

		• Devising an action plan to reduce their footprint.	
	15-18	• Imaginary library of books that depict stories related to environmental issues/sustainable development.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Climate change and its impact on different regions and people around the world.	Biology Geography
	15-18	• Sport's ecological footprint (e.g.: analysing football's environmental impact and sketching out environmental measures that football clubs could undertake in order to lower their environmental damage).	Physical Education
	15-18	• Sporting activities with the aim of calling students' attention to environmental/ecological problems, for example a race titled "Running for a better environment".	Physical Education
Global Goal 14 – Life below water	15-18	• Creation of a thematic anthology of poems and narrative texts about nature written by famous authors from the countries involved in the project.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Creation of an anthology with texts about topics related to the environment/ecology written by students.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Reading meetings where selected texts about nature in general and the different kinds of nature (wild, marine, violent, peaceful natures ....) are shared and discussed.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Debates about the importance of the environment and its influence in the formation of one's identity, as well as about the lack of knowledge of the environment that surrounds us and the ignorance of our country's nature.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Imaginary library of books that depict stories related to environmental issues/sustainable development.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Writing diaries: "Discovering my natural world".	Portuguese (Mother Tongue)

			Portuguese Literature English language
Global Goal 15 – Life on land	15-18	• Designing posters/leaflets aimed at raising awareness about how our natural world can be managed and used sustainably for generations to come.	English language Natural Science Biology
	15-18	• Creation of a thematic anthology of poems and narrative texts about nature written by famous authors from the countries involved in the project.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Creation of an anthology with texts about topics related to the environment/ecology written by students.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Reading meetings where selected texts about nature in general and the different kinds of nature (wild, marine, violent, peaceful natures ....) are shared and discussed.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Debates about the importance of the environment and its influence in the formation of one's identity, as well as about the lack of knowledge of the environment that surrounds us and the ignorance of our country's nature.	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Imaginary library of books that depict stories related to environmental issues/sustainable development.	Portuguese (Mother Tongue) Portuguese Literature English language
		• Writing diaries: "Discovering my natural world".	Portuguese (Mother Tongue) Portuguese Literature English language
	15-18	• Bird watching; identification of bird species; researching about endangered species, as well as ways to protect them.	Biology Natural Sciences
	15-18	• Exploring water biological diversity and the threats it has been subjected to due to the different kinds of pollution.	Biology Natural Sciences

Appendix 10

Poland_ Curriculum grid

These are example suggestions, to identify potential progression for pupils. Some opportunities cover more than one global goal and they are mentioned at each goal.

Global Goal	Age Range	Opportunities	Subject
Global Goal 6 – Clean water and sanitation	16-19	• Clean water and sanitation and its impact on societies and health conditions.(G6)	Geography
	16	• Clean up the World- informal happening. (G6)	Biology
Global Goal 7 – Renewable Energy	16-19	• Renewable energy resources – pros and cons.(G7)	Geography English
	16	• What are natural resources?(G7)	Biology
	16	• International Earth Day- informal happening. (G7)	Biology
	16-19	• Energy mix and climate change. (goals 7, 13)	Geography English
Global Goal 12 – Responsible Consumption	16-19	• Sustainable tourism – why it is important? (Goal 12)	Geography
	16-19	• New technologies and growth of consumption.(G12)	Geography
	16-19	• E-waste and responsible consumption – school happening.(G12)	Geography
Global Goal 14 – Life below water	16	• Environmental impact of genetically modified organisms.(G14&15)	Biology
	16	• How is biodiversity related to the biosphere? (G14&15)	Biology
	16	• Causes of the loss of biodiversity. (G14&15)	Biology
	16	• Different types of environmental conservation. (G14&15)	Biology
	16	Endangered species conservation. (G14&15)	Biology
	16	Environmental laws and regulations in Poland. (G14&15)	Biology
	16	World biodiversity and endangered species conservation- a visit to Wrocław Zoo. (G14&15)	Biology
	16-19	• International law of protecting	Biology

		nature (goals 13,14,15,16)	Social Studies
	16-19	• European Union and Lisbon's strategy on a climate change and sustainable use of energy.(goals 13,15,16)	Biology Social Studies
	16-19	• Energy mix and climate change. (goals 7, 13)	Geography English
Global Goal 15 – Life on land	16-19	• Land biodiversity – anthrop progression and causes and consequences of de forestation.	Geography
	16-19	• Wschowa's urban heat is land – outdoor survey.	Geography
	16-19	• Solider gradation and erosion – informal project outside classroom.	Geography
	16-19	• World agriculture – possibilities to solve the famine and poverty.	Geography
	16	• Environmental impact of genetically modified organisms.(G14&15)	Biology
	16	• How is biodiversity related to the biosphere? (G14&15)	Biology
	16	• Causes of the loss of biodiversity. (G14&15)	Biology
	16	• The impact of agricultural practices on biodiversity. (G15)	Biology
	16	• Different types of environmental conservation. (G14&15)	Biology
	16	• Endangered species conservation. (G14&15)	Biology
	16	• Environmental laws and regulations in Poland. (G14&15)	Biology
	16	• World biodiversity and endangered species conservation- a visit to Wrocław Zoo. (G14&15)	Biology
	16	• International law of protecting nature (goals 13,14,15,16)	Biology Social Studies
	16	• European Union and Lisbon's strategy on a climate change and sustainable use of energy.(goals 13,15,16)	Biology Social Studies
Activities associated with other global goals	16-19	• Importance of natural resources in international politics. (goal 16)	Social Studies
	16-19	• Sustainable development and	Social Studies

		Human Development Index. (goal 16)	
	16-19	• Initiatives and inventions of helping developing countries. (goals 16,17)	Social Studies
	16-19	• International law of protecting nature (goals 13,14,15,16)	Biology Social Studies
	16-19	• UN and its Specialized Agencies (f.e. UNICEF, OECD, FAO, IFAD, UNWTO) (goal 16)	Social Studies
	16-19	• European Union and Lisbon's strategy on climate change and sustainable use of energy (goals 13, 15, 16).	Biology Social Studies
	16-19	• Urbanization – sustainable solutions for cities. (goal 11)	English French Geography
	16-19	• Poverty in the world – how to fight it? (goals 1, 2)	English
	16-19	• Providing good education to everybody. (goal 4)	English
	16-19	• Peaceful and fair societies. (goal 16)	English
	17-18 18-19	• *As it should be* ... The Polish positivism in the novel of Eliza Orzeszkowa. The ideals of positivism in the literature of the era. The realization and settlement with them. (goals 1,2,3,4)	Polish
	17-18 18-19	• *Obligations to humanity and civilization.* Password positivism in a feuilleton. (goals 1,2,3,4)	Polish
	17-18 18-19	• *The image of society in novel of Bolesław Prus „Lalka".*The ideals of positivism in the literature of the era. The realization and settlement with them. (goals 1,2,3,4)	Polish
	17-18 18-19	• Emancipation in the eyes of feminists. (goal 5)	Polish
	17-18 18-19	• City theme in literature and art. (goals 9,10,11)	Polish
	17-18 18-19	• The image of a modern city. (goals 9,10,11)	Polish
	17-18 18-19	• The war and occupation in culture and literature. Introduction (goal	Polish

		16)	
	17-18 18-19	• The voice of a generation of war. (goal 16)	Polish
	17-18 18-19	• Poetry about the reality of communism. (goal 16)	Polish
	17-18 18-19	• Poetry as a comment to the Present. (goals 5,10,16)	Polish
	17-18 18-19	• In the world of new media. (goal 16)	Polish