Gardening as a pedacogical tool

documentation and inspiration for teachers in Sweden and the Baltic region from workshops in Panevezys, Lithuania, in 2014





Project name: Nature Schools Network

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Preface

Background of the project

This pedagogical handbook is a part of Nordplus project Nature schools Network (2013-2015).

When the *Commission on Education of Union of Baltic Cities (UBC)* held its annual meeting in April 2009 in Tallinn, representatives from different nature schools participated and presented their work. After that it was decided that we should create a formal network of nature schools with the aim to develop new strategies and new material for the pedagogical methods to be used in outdoor and natural sciences teaching in Sweden, Estonia, Lithuania and Latvia.

This network was established and has been funded by Nordplus Horizontal 2010-2012 and the network has accomplished:

- Three courses on the themes:
- Outdoor teaching
- Humans and nature, where nature is represented by 3 different biotopes i) water, ii) forest and iii) acre land
- Pedagogies in teaching climatic effects

Three pedagogical handbooks (PDF in English at www.farsnanaturcentrum.se)







- Two class exchanges (Sweden-Estonia)
- One Comenius Regio application (granted for 2011-2013) between Tallinn and Norrtälje Municipality with Nömme Nature House, Erken Laboratory and Norrtälje Nature Conservation Foundation as partners. The aim of the network was to grow by adding partners and increasing collaboration with local enterprises in the field of nature conservation, nature guiding, local organic food production and monitoring of the environment (researchers) as well as teachers. We had partners from teacher training (higher education, Uppsala

University), Commission on Education and Environment of UBC, small enterprises and we collaborated closely with local teachers from secondary and upper secondary schools joining our workshops and seminars.

Purpose

The purpose of the first three years of the last Nordplus project was to establish a network for nature schools in the Baltic region and to create courses and course material (pedagogical handbooks) for teachers in these countries. As the network has been established, visions for the future have also been made. The three main aims for the period (2013-2015) are:

- 1. To have two 3-day workshops/seminars every year, and to distribute the hosting of the workshops/seminars among the partners. This will enable all partners to contribute more and to make the best use of their most prominent fields of knowledge. This will contribute to high quality workshops raising the capacity of the network to a higher level to be used in all participating countries and to be spread to all members of the Union of the Baltic Cities (UBC) and within the network of the Cost action Netlake (EU).
- 2. To include small enterprises and researchers in the field of nature conservation, nature guiding, local organic food production and monitoring of the environment in the workshops/seminars together with nature school teachers, local teachers and representatives from higher education of teachers in order to contribute to cooperation between the educational sectors and to establish cross-sectoral networks involving participants outside of the traditional education sectors.
- 3. To produce and edit handbooks for each workshop/seminar event to be used to spread the pedagogic highlights through the networks mentioned above and via the web site.

Aims and contribution for this new project Nature Schools Network 2013-2015

We feel that the aims stated by the Nordplus program, and for all participating partners in this project are in common:

- Increase the exchange of pedagogical ideas and methods related to nature within the Baltic region leading to a higher quality in outdoor educational activities
- Develop an understanding for field education on different levels in the school system from elementary school to university using new input from small enterprises in the field of nature conservation, nature guiding, local organic food production and monitoring of the environment

• Be a part of producing pedagogical handbooks during each event and also be able to distribute them in the home country





• Transfer the hands-on knowledge of small enterprises to teachers and educational program in schools and in the university program for teachers

Sectors who are involved in the project

- Higher education
- NGO
- Primary/secondary/upper secondary Schools
- Private sector



Nature House in Panevezys I Lithuania with the principal Regina Kliminskiene.

We really hope that this handbook will inspire teachers to go outside with their pupils and see the large classroom- the garden, the schoolyard, the nature, the seas, the rivers, different environments and the seasons.

Anna Westerlund, project coordinator,

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Gardening and vegetables as a pedacogical tool

A garden is a wonderful place for learning. With all senses the pupils learn about nature, seeds, food, beauty and ecosystems. It is a perfect place for curiosity, questions and investigation.

Outdoor learning wants to give as many sensory experiences as possible. The sensual experiences create memories for life. We strive to build good self-esteem for the participants and the group will be strong when they work together. Nature, vegetables, flowers, animals, garden and outdoor living is a tool that creates unprecedented opportunities. Go outside with the pupils!

Outdoor education is about learning in authentic environments. A new world open up, when we leave the indoor environments and also use the outdoor environments near school. Opportunities to find knowledge today and in the future are staggering. The pupils must learn inside, outside, in reality, in books, with internet and so on. Outdoor education is about learning in authentic environments with all the senses, to touch, see the wholeness and the pupils have to feel that they are a part of the learning process.

We can work with many aims in the curriculum and all subject in the garden. Mathematic, biology, chemistry, art, language, music and different handicraft. It is also a perfect classroom for discussions about a sustainable future.





It's a good idea to have a diary for the garden in the school. You can have just one diary for all pupils and teachers. The pupils are writing and drawing about the work and processes. They can also put photos inside. Everyone at school is able to read about the work, the discussions and the reflections.

Suggestion about activities in the garden during the year:

November-February

- Dreaming, thinking, planning and drawing a dream garden
- Budget
- Aims for the growing and garden design
- Democratic processes surrounding the planning of the garden and discussions with the head teacher or municipality
- Planting indoors with exotic plants and traditional houseplants
- Planning for the spring
- Buying seeds

March-April

- Sowing in hotbox
- Start to cultivate seeds and plants indoor
- Cut bushes
- Pruning fruit trees
- Flipping and give oxygen to he compost
- Dug around in the earth, flip, trim and fertilize
- Clean in the garden

May

- Cut lawns
- Weeding
- Start cultivate indoors, and take out the seedlings a few hours per day for habituation
- Watering
- Plant out some pre-cultivated plants (warning of frost)
- Construct scarecrows
- Planning for watering during summer
- Harvest the new rhubarb and cook something delicious. Eat it then in the garden together and enjoy with all the senses.

June-July

- Cultivate more seeds in the garden.
- Plant out pre-cultivated plants
- Weeding
- Harvest
- Visit another beautiful garden

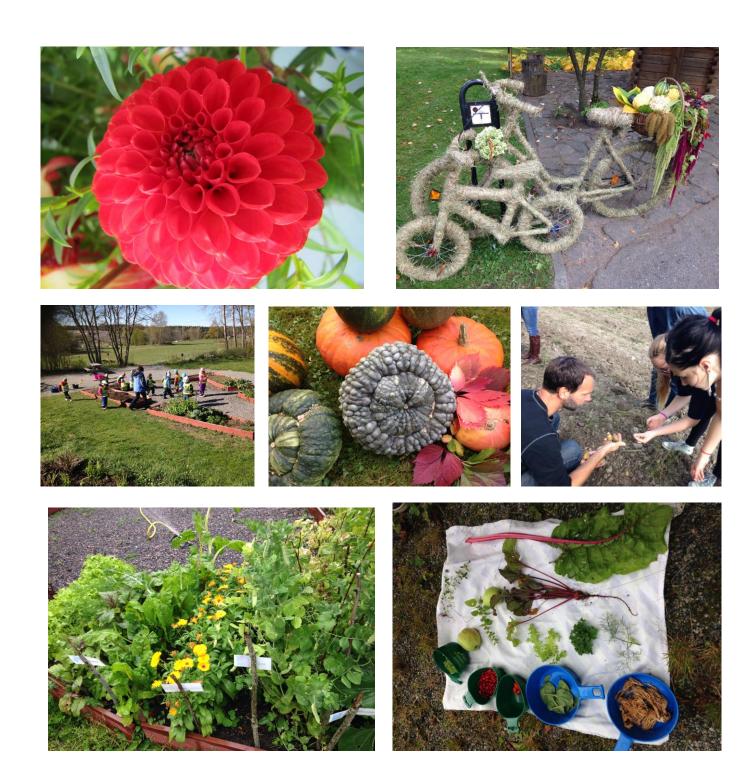
August-September

- Harvest or harvest market
- Collect the seeds for next year, put in a self-constructed beautiful bags.

October

- Planting and transplanting perennials and bushes
- Turn around the compost and give it oxygen
- Fertilize
- Close the garden for winter

Inspiring learning environments



Recommendations for leadership outdoors

- Respect any fears in the group.
- Aims and tasks should be clear to the participant.
- The leader is always a good role model for clothes, safety and approach.
- The participant's needs and questions will always come first. The leader must be flexible and willing to change plans. Catch the situation and see all possibilities. Take advantage of the seasons and the weather changes to create diverse experiences.
- High level of knowledge about nature, other subjects and hiking knowledge gives confidence in the leadership.
- The learning/activity should be adjusted according to season and climate. Lessons, discussion and information should be in a circle so everyone feels involved. The leader should not speak against the wind and preferably seek shelter for the wind.
- All participants' basic needs should be satisfied warm, fed, dry and well-rested.
- Activities and games should be inclusive. Cooperation should be encouraged and trained.
- The location of the activity should be carefully chosen and the leader should be familiar
 with it. With younger children, it is advisable to return to places so that they become
 confident, which is a prerequisite for learning. For youth new places can be a challenge
 that inspires to investigative work.
- Prefer to get long lessons to reduce stress and give participants the chance to learn, play, and also have some recreation.
- Safety should always come first in outdoor learning. It is important to be familiar with the plans for accident or disappearance.

Examples and methods

Example 1 Drawing with vegetables

Aim/purpose

Pupils will get more knowledge about vegetables while doing a creative task.

Preparation

To collect different vegetables, their leaves, stalks and blossoms. The best way is doing this together with the pupils the day before or in the beginning of the lesson.

Material

 Different vegetables or their parts (leaves, blossoms, roots, stalks), paper, knives, chopping boards

Method

It is creative practical work. The task can be for pupils of different ages and can be performed individually or in groups. Drawing time is 15-20 minutes.

The task starts with a discussion. The teacher asks the pupils the following questions:

- Which vegetables do you know?
- Which vegetables do you like?
- Which raw vegetables and which boiled vegetables do you eat?
- Do you like colour vegetables?
- Which vegetables or their parts are red, yellow or green?

Then the main question is:

-Do you know that vegetables colour paper and it is possible to draw with a juicy piece of a vegetable or fruit as if it were a colour pencil?

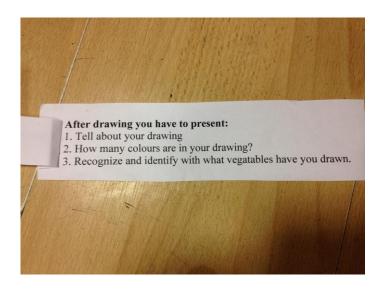
Pupils are usually not familiar with this and want to try this task. The teacher explains that drawing with vegetables is not a traditional way of drawing. Swiping a juicy part of a vegetable over a sheet of paper is very exciting. It's also possible to get many different shades.

Tasks

Task1:

Every pupil or a group of them get a sheet of paper on which they have to draw a colour palette with different vegetables. The challenge is to get as many colours as possible.

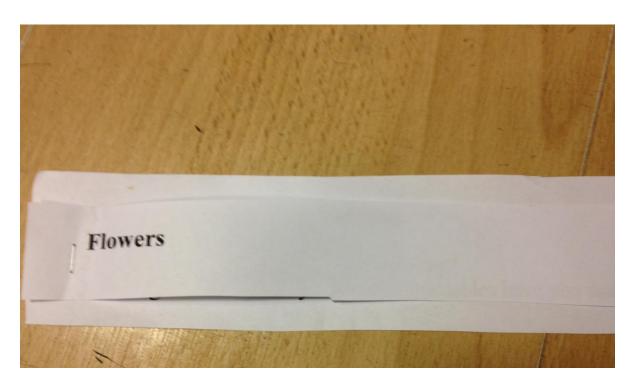




Task 2: Creative work – every pupil or a group of them get one more sheet of paper on which they have to draw a picture according to their chosen topic using different vegetables like colour pencils.







All groups gets different topics as flowers, fishes, trees, spring, summer and so on.

When the creative works is finished, it is time to present them. Everybody tells how successful they were in drawing, how many colours they succeeded in getting and which vegetables were used to do the task.

Reflection

Most of the pupils will be very interested in vegetables. Not just as food, so from now they maybe will taste more different species.

Example 2 Knowledge of vegetables while identifying their seeds

Aim/purpose

Pupils will learn more about seeds and plants. To encourage pupils to get to know vegetable and cereal seeds, and relating them to the relevant plant

Preparations

You need to obtain or make boxes with small sections to put the seeds in, so the pupils can make selections of different vegetable or cereal seeds. You also need to prepare herbarium of vegetables or cereals (or plants themselves) whose seeds will be used to do the task. At last you need to prepare the task sheets.

Materials

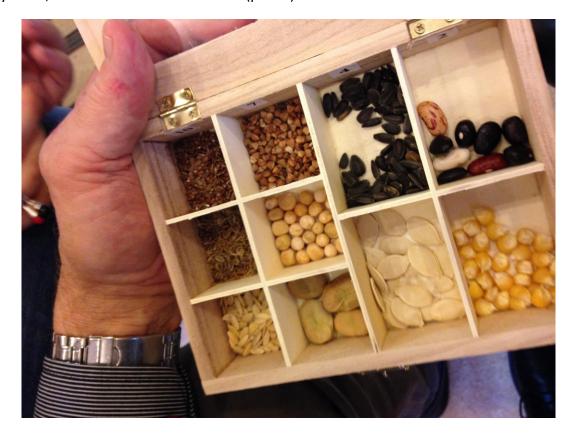
- boxes
- plants or herbarium of plants
- seed selections
- paper
- pencils

Method

The task is goos for pupils of different ages and can be performed individually or in groups. The methods of observation, research, and comparison of objects are used to perform this task. It is explained that children often know vegetables quite well because they see them in the kitchen, garden or while eating them, but they do not always pay attention to vegetable seeds and cannot identify them. The boxes with different vegetable and cereal seeds in the numbered sections are given to the pupils.

Tasks

Task 1: The pupils will now opening the box to examine the seeds in the separate sections, touch and identify them, write the names of the seeds (plants) in the second column of the task sheet.



Task 2: The pupils will identify the numbered plants (herbaria) and write the number of the plant in the third column of the task sheet in the row in which the name of the plant is marked after the identification of it according to the seeds.



Task sheet

	Which seed is it?	The number of the plant
1	Corn	5
2	Haricot beans	1
3	Pumpkin	6
4	Sunflower	2
5	Beans	7
6	Peas	10
7	Buckwheat	9
8	Cucumber	3
9	Dill	4
10	Flax	8

Reflection

It is discussed how successful the children were in identifying the seeds, which seeds were familiar to them, which seeds they saw for the first time, which was easier to identify – seeds or plants (herbaria), whether it was difficult to relate the seeds to the plants.

Example 3 Identifying vegetables with the help of different senses

Aim/purpose

The pupils will learn to identify vegetables with the help of senses.

Preparation

Make boxes or bags to hide in vegetables or their seeds in order to do the task using the sense of touch. Then it is time to make closed boxes to hide different vegetable seeds in order to do the task using the sense of hearing. Cut different kinds of vegetables into small pieces in order to do the task using the sense of taste. Make bags from thin natural opaque fabric in order to do the task using the sense of smell. Make task sheets.

Material

- vegetables
- their seeds
- cardboard boxes (or bags)
- thin natural fabric
- single- use dishes (plates, spoons)
- paper, pencils

Method

The task is for pupils of different ages. It is explained that getting to know the environment and its elements cannot be separated from human senses. The king of senses is sight. A person gets a great amount of information with the help of it.

This task of identifying vegetables is special because different human senses are used-touch, hearing, taste, smell and sight.

The tasks can be performed individually or in groups.

Tasks: (all the tasks can be performed in any sequence).

Task 1: to identify the vegetables hidden in the box using only the sense of touch.

Some vegetables are put in a closed box with two holes to put hands in (e.g. carrot, cucumber, pumpkin, potato). A pupil has to touch each vegetable separately, identify them using only the sense of touch and write down their names on the task sheet (the order number is not important). Pupils

get a lot of emotions while doing this task!



Task 2: to identify vegetable seeds hidden in the closed boxes using only the sense of hearing. Different vegetable seeds, e.g. beans, peas, dill, pumpkins are put in closed boxes with different numbers. Before doing this task pupils can look at the seeds, discuss them and determine which plant each seed belongs to. When they have done that, the pupils have to take each box and shaking it to identify which seeds are in every box according to the sound they make. The answers should be marked on the task sheet.

Task 3: to identify vegetables while tasting small pieces of them. The vegetables should be cut into cubes or sliced thinly.

Different vegetables, e.g. pumpkins, potatoes, cucumbers, radish are cut into small pieces and put on numbered plates. Examining the vegetable pieces it is hard to identify them. Pupils taste vegetable pieces from every plate, identify the vegetables using the sense of taste and mark the answers on the task sheet.



Task 4: to identify vegetables hidden in closed bags using only the sense of smell.

Thinly sliced vegetables are put in closed numbered bags. Each bag contains a different kind of vegetables, e.g. garlic, onions, parsley, pepper. Pupils have to smell each bag, to identify the vegetables using only the sense of smell and mark the answers on the task sheet.



No.	Touch	Hearing	Taste	Smell
	Vegetables names	Seeds names	Vegetables names	Plants names
1				
2				
3				
4				

Reflection

The following points are discussed:

- -How important were the different senses?
- -Which task was the easiest and which was the hardest?

Give the correct answers to the pupils and the pupils can check their results.

Example 4

Natural farming

"Natural farming", lecturer Saulius Jasionis



Natural farming has been cultivated in Lithuania for about 10 years. It is spreading at a great speed. But is it really a new way of farming and what is so special about it? The essence of natural farming is described as a search for simplicity and independence in all the spheres of agriculture.

What is the difference between intensively cultivated fields and natural fields which are allowed "to rest"? Firstly, in cultivated fields the soil is cultivated several times a year, namely it is ploughed, harrowed and cultivated while in natural fields nobody cultivates the land except for the species living in the soil, for example insects, worms, moles etc. Secondly, in cultivated fields only crops are grown which are harvested and the largest amount of accumulated energy is taken away whereas in natural fields everything that sprouts and all organic plant material, all accumulated energy stays in the soil. A continuous decomposition of plant material on the surface of the soil guarantees a perfect nutrient cycle for plants. This process is a real important and the necessary conditions for it are moisture, warmth, oxygen but the most important is food for microbes, and all these conditions are possible due to the fresh plant material on the surface of the soil. Thirdly, cultivated fields are fertilized with mineral fertilizers and sprayed with poisonous chemicals but this is not done in natural fields. The above mentioned differences are sufficient to understand the basic differences between modern agronomy and natural processes.

Consequently, the main principles of natural farming could be summarized as follows:

- The land is not cultivated unless it is a necessity
- The vitality of the soil is kept safe and stimulated as it is the basic condition for fertility
- All attempts are made to preserve and increase plant- and animaldiversity in gardens, kitchen gardens and pastures
- Weeds are not removed as they have a favorable impact on the health and quality of plants
- It is desirable that all plants and animals in agriculture would be interrelated, i.e. every sphere of agriculture would be useful to the other spheres
- No fighting against plant and animal diseases, no using of special prophylactic measures since the proper living conditions for plants and animals should guarantee their health
- The term "pests" does not exist. A wide variety of plants and animals in the environment do not allow any species to dominate
- In the gardens and kitchen gardens of small towns and settlements closed cycle systems are popular. It means that no plant material from outside are used, which leads to the independence of the farm
- In the countryside farm boundaries are being removed in order to integrate sustainable forms
 of farming into natural environment
- The old species of plants and animals that have become accustomed to local conditions are being preserved and developed as resistant plants and animals ensure stability of the farm and lower energy costs



Exempel 5

Hotbox/hotbed

Aim/purpose

That pupils will be involved in the cultivation processes. They should also be informed about ways to cultivate and different processes in nature.

Preparation

This activity will be in spring.

Material

- horse manure
- boxes made of wood(look at the photo beside)
- potting, soil
- thermometer

The thermometer in hotbox quickly showed 40 degrees. In the surrounding soil in the garden the temperature was only 8 degrees at the same time. This is a good experiences for reflection, analysis and learning!



Method

A hotbed can easily be constructed of fresh horse manure mixed with straw and placed on top of a pallet collar with soil, covered by glass or an old window. Horse manure must be retrieved in the stable or paddock, pallet collar laid in place and the planting soil preparation. Horse manure should be in a rectangle that is 40 cm wider and longer than the collar. The manure must be about 30 cm high. It is a hard work!

When the hotbed is finished, another task should be to examine the difference between the soil at the side of the hotbed and the soil in hotbed where the microorganisms have accelerated the degradation processes and the temperature increased. The thermometer is inserted when the work is completed and now the participants can guess how hot it will be in 10 days. Exciting!

Reflection

This is very fascinating and the soil temperature rise from +5 degrees to + 35 degrees in about a week. Then you have to wait a bit till to the temperature drops and it is time to sow.

When you are sawing with small children, you can advantageously use large seeds of the participants

- garlic cloves
- onions
- potatoes
- grains of various kinds such as avocado, nectarine, apple or orange

With a hotbox the cultivation will start early in spring. A bonus of making hotbox is that participants can take part of delicious flavors long before cultivation in the open air is ripe for the harvest!

To the right, a wonderful dish with beets, cheese and potatoes. Harvesting directly from the warm bed and cooked over an open fire, that is a meal that touches all the senses and you will never forget it.



Exemple 6 Cultivation of potatoes

Aim/purpose

Pupils will learn about the process of growing.

Preparation

Planting potatoes occurs in the spring and the soil needs to be +8 degrees. Prepare materials and place cultivation.

Material

- a field if you have one☺
- buckets
- soil if you are planting in buckets
- potatoes
- shovels
- rakes



Method

To carry out activities with potato cultivation can mean anything from planting potatoes, cup potatoes and to harvest.

Pupils plant the potatoes in the spring and then return to harvesting in the fall. How much was it? What does a potato need to grow? How do we keep them in the winter? What can you use them for?



When pupils take part of this process, they hopefully get more respect for the food and it is a good method to work for sustainable development. Could there be a better learning environment for sustainable development?

Example 7 Sunflowers



Is there any flowers that is more fascinating than the sunflower? How is it possible that a small seed can create a 3-4 meters powerful flower? Last fall I saw in distance, some 15 year old guys get into the garden. They saw the sunflowers they have sown in spring and they were so impressed and engaged. The sunflowers are amazing!

Aim/purpose

The aim is as always to strengthen the self-esteem of the participant. To cultivate requires care, participation and responsibility. The goal is for everyone to be involved and everyone can cultivate. Cultivation is life and gives vigor to the participants in several senses. The pupils will also learn about the photosynthesis.

Preparation

Seeding of sunflowers is made in spring. Prepare materials and place of cultivation. Participants can so in a tin can, an empty milk carton or different containers. Look in kitchen cabinets and store different containers. The aim are that nothing should be to not be bought, except seeds.

Material

- planters
- seeds from sunflowers
- soil
- water

Method

The pupils have to choose a planter. It is a good idea to only use recycled containers, as part of efforts to seize resources and show that anyone can garden independently of the economy. Make holes in the bottom with a nail or other sharp object. Then it's time to replenish the soil. Make a 1 cm deep hole in the center with your finger and put a seed in the hole. Cover the seed with soil and then water gently. Now is it just to put the pot in the greenhouse, the window in the kitchen or in the classroom and wait. When does the seed germinates and when would we see the first growth?

Reflection

I think that every person would feel good if they planted a sunflower in spring. It gives hope, confidence and joy. - Imagine how beautiful it would also be on the schoolyard, balconies, playgrounds, squares, retirement home, hospitals, cottages and castles!



Exemple 8 The autumn chest

Project name: The autumn chest

Project manager: Valda Briedienė, Rima Ivanauskienė, Virginija Kuzmienė

Authors: Regina Kliminskienė, Rima Ivanauskienė

Aim/purpose

The aim of this project is to gather vegetables for Panevezys Nature schools animals during winter time. The objective is to develop children's creativity in a natural environment using natural remedies - natural goods.

Preparation

Cultivation with the pupils to get a lot of vegetables. Keep connections with classes and get them involved in the project.

Material

A lots of vegetables. The vegetables shouldn't be pierced, damaged or rotten. All well-kept vegetables are going to be saved in the underground storehouse.





Methods

Every year Panevezys Nature School encourages pupils and their teachers to participate in this gardenproject. Kindergartens and schools gather vegetables, fruits and other autumn harvests. They are given a place where each group makes an art of their own gathered harvest. They need imagination and it also depends what they have brought.

All classes have an own part of the garden and do their art there. Then it is time for exhibition for some days with an open garden. Everyone is invited to come and see all objects. After made exhibition each group or class get prizes and diplomas. The pupils are encouraged to participate next year. After exhibition all rotten vegetables are thrown to compost and well-kept vegetables are taken to the underground storehouse.

Reflection

The project creates beauty and also rational use of the exhibition for animal welfare. The exhibition also promote the region's natural activities of the school.





Exemple 9 Collecting seeds

So, finally the wonderful autumn! Then it's time to enjoy the autumn with sunflowers, apples, mushrooms and berries. A cozy activity is saving seed for next year.



Aim/purpose

The aim can be to demonstrate sustainability, where we take care of nature's resources. Another aim is to concretely demonstrate the ecosystem, and as part of the cultivation process. The aim is also to inspire pupils to learn more about seeds, flowers, fruits and the process in nature.

Preparation

No preparations, except gathering the seeds pods.

Material

- sunflowers, columbine, marigolds, lupins and other seeds of flowers
- tray
- tables
- coffee filters, envelopes or fold their own seed bags in paper
- markers

Method

There are lots of different seeds to collect. For example you can start with sunflowers. Wait until the seeds are hardened on the flower. Cut the flower and let it dry and warm. It is best outdoor or in a greenhouse, but remember to protect them from birds. Remove the seeds and let them dry. It is best to be on a tray.

It is difficult to know when the seed pods releases the seeds, so you have to look often in the garden and do not wait too long. It is important that all leaves and pods removed otherwise the seeds are going to become moldy.

Now it's time to store them dry and dark. It is most suitable to pack the seeds in paper bags. Depending on the participants' ability and interest, you can choose different packages. The easiest is to take a coffee filter and shove seeds in. Then fold down the top edge. Tape the edge and writing with marker pen on what plant it is, and the date. If you want to budge own seed bags, only to watch a purchased packet of seeds and have as a template. The pupils can write the plant's name and maybe paint the bag. It will be a really nice Christmas present or gift.



Example 10 Prints from seeds

Aim/purpose

To examine plants in a sensual way and awaken curiosity about scientific phenomena such as photosynthesis, chlorophyll and biodiversity.

Preparation

Cut pieces of cloth to the group.

Material

- pieces of cloth of linen or cotton
- stones
- flowers and leaves of vegetables
- a bench or a table in an outdoor environment

Method

Let the pupils collect flowers or leaves. Then they take a cloth and lay flat. Place the plant on one half and fold over the other half. Then take the stone and beat gently on the cloth. Now you see how the sap of the various hues penetrates the cloth. When the whole plant is visible, it is time to open up the cloth. It has now become a beautiful color patterns. It is also a very good moment in examining a plant and its parts.



Example 12

Ecosystem



Aim/purpose

Working with ecosystem allows pupils to reflect on the nature variety and wholeness-ecology.

Preparation

Select a suitable natural or an available garden.

Material

- shovels
- tape
- transparent jars with lid
- water

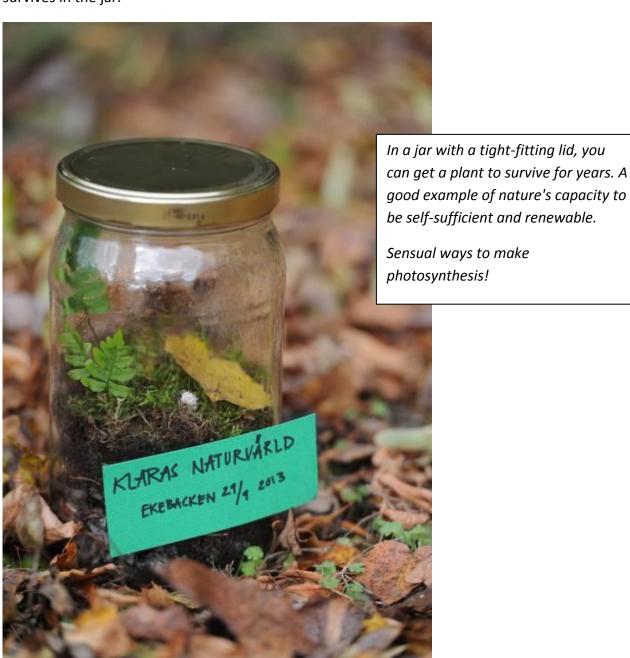
Method

Let the pupils discover the ecosystem in pairs or small groups. Let them choose a small arbitrary area to investigate. A good way is to get a grip on the ecosystem is that they think in different layers. Allow pupils needs to use all their senses and equipment like magnifiers.

Option 1 Ecosystems in jar

Talk about the ecosystem and what is needed for the ecosystem to be self-sufficient so you can come up with how to build their own ecosystem. Build ecosystem in a jar with tight-fitting lid. Start with some drainage material in the bottom of the jar, for example stones. Continue with a seedling of what you will find, as you dig up the root balls and everything. It works well with moss, wild strawberry plant or a small tree.

When the pupils are satisfied it is time for a discussion if they need more water. The idea is that there will be a small loop of water, oxygen/carbon dioxide and nutrients to ensure that the plant survives in the jar.





Partners in the project



Activity 3 in Panevezys, Lithuania, October 2014. Visit on a fantastic private farm of Marius Venslovas near Šeduva in the countryside. They are working with natural farming.

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Unit: Pärnu Nature House

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Type of institution: NGO

Country: Estonia

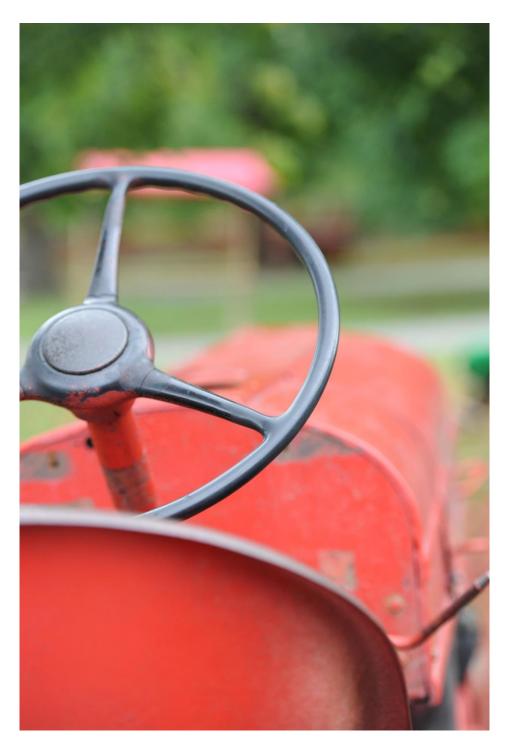
Contact person: Mehikas, Roosi E-mail: mehikasroosi@gmail.com Phone number: +3726 723 930

Institution: SE-Uppsala University, Erken Laboratory and Biology Education Centre (SE-UU)

Type of institution: University

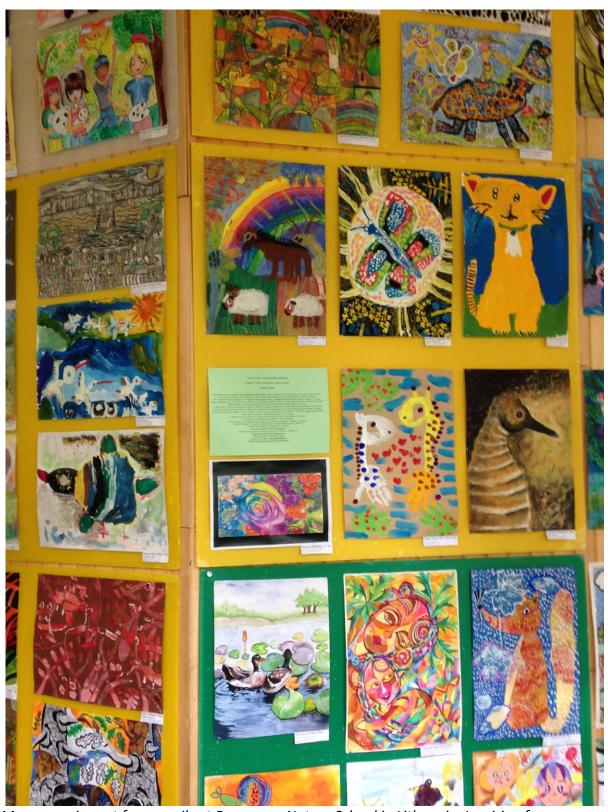
Country: Sweden

Contact person: Beronius, Karin E-mail: karin.beronius@ebc.uu.se Phone number: +46184712864





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