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Green space for education

Guide for teachers

Polish Society for the Protection of Birds

Topic: We set up a flower meadow

Duration: Minimum 3 hour lesson, depending on the needs of studets the teacher can extend the duration of the lesson.

Age group: 9-13 years

Aim:

1. Getting to know the secrets of gardening.
2. Creating a place for observing nature on a daily basis.

Materials and aids:

- garden tools, such as shovels, garden rakes, hoes, gloves, string, watering cans;
- seeds of selected species of grasses and flowering plants or a purchased mixture of seeds of flowering meadows ready for sowing.

Important information for implementation:

The best time to sow flower meadows is from the second half of April to the end of May, because frost and too much heat can damage the plants being sown. The seed preparation work must be carried out in good time.

Course:

This project can be implemented via the folloing protocol. This proposal contains two main elements of action. The first concerns the initial stage of the project, i.e. the creation of a flower meadow. The second is a proposal for classes that can be carried out using a meadow prepared with students.

Establishment of a flower meadow – Introduction lesson to the project

1. Start by taking students to a place where the creation of a flower meadow is planned. Replacing lawns of uniform green grass which have few species with beautiful flower meadows is becoming more popular as a form of urban greenery.

   Ask the students if they have heard the term "flower meadow" and what they know about it. After listening to everyone's answers, complete the information about the importance of flower meadows:

   A flower meadow is a green area established in different urban and rural areas instead of ordinary lawns. Flower meadows in their composition contain not only grasses, but also various species of other plants with distinctive flowers. They are attractive not only for people, but also for different species of animals. Flower meadows are created all over the continent in gardens, parks, urban green belts and even in balcony boxes. Every year new areas of these meadows are established.

2. In the place where the flower meadow is planned, display different cards with information about the flower meadow, with the page put into the ground (attachment 1). Students should approach the selected card in pairs, pick it up and read the information out loud.
3. After summarizing the information about the value of flower meadows and discussing it together, decide with your students whether they want to create a flower meadow or not.
4. Once the decision is made, divide the students into three groups:
   - Group 1 - prepares the ground for sowing meadows
   - Group 2 - creates a seed mixture and performs sowing
   - Group 3 - documents the process and creates a chronicle of the flowery meadow.

   The whole class: every day the selected pupils should water the meadow, ensuring that the soil is constantly moist until the first plants germinate and stabilise.
5. Group activities

Group 1

The assigned group will plan its work and prepare the necessary tools independently or in consultation with the teacher. You can start work in the autumn or early March (Northern European seasons). For this purpose, students can go to a gardening shop or organise an "expert day", inviting a person to the school who will talk about flower meadow cultivation and answer all the necessary questions.

The students will need to research which tools are needed to prepare the ground for a meadow and the best soil for sowing. Students can also use the literature, websites or instructions in Appendix 2.

After obtaining the necessary information and tools, the pupils should prepare the ground for sowing a flower meadow.

Group 2

The students search in different sources for information about which plants can form a flower meadow. You can buy a ready-made mix, but the more interesting solution is to create your own one. For this purpose, the group goes to the gardening shop to get tips and buy the right seeds.

<u>A clue:</u>

The best grass species to create a meadow are red fescue or meadow grass.
Flowering plants that attract bees and butterflies include asters, marigolds, impatiens, lavender, sand thyme, white and yellow sweet clover, blue phacelia, field poppy, cornflower, common yarrow, gilt, ragged nettle, carrot and others.

Butterfly plants can also be sown which, in addition to attracting insects, enrich the soil with nitrogen and improve its structure through symbiosis with bacteria. These may include, for example, lupines, clovers, alfalfa, vetches.

Students should create a flower meadow seeding card (attachment 3).

Group 3

The group creates a photo collage, photographing and describing the stages of work. The report can be produced in the form of a multimedia presentation, poster or school newspaper. A ready-made photo report can be given as a gift to the gardening shop, the municipality and other people who helped to create the flower meadow.

From the moment of planting, the whole class should take care of the meadow, documenting its changes in the photos until the flowers bloom.

Annex 1: Flower Meadow Information Cards

Flower meadows can be inhabited by up to 300 species of animals (small mammals, insects, amphibians, small reptiles, birds). By sowing a meadow, we give them a home!	Flower meadows stop the smog-forming dusts that are dangerous for humans.	Flower meadows provide food (in the form of nectar, pollen, etc) and shelter for insects – including pollinators, which we rely on for flowers, fruits and vegetables.
A flower meadow does not require as much treatment as an ordinary lawn and it tolerates drought well. It is sufficient to mow the meadow twice a year with a scythe. A lawn mower is noisy and emits a lot of exhaust fumes into the atmosphere! A mower will also kill insects and small animals.	A flower meadow absorbs twice as much water as a cut lawn and thus contributes to the protection of the area against flooding.	Flower meadows reduce air temperature, which is important for humans and animals in the heat of the day.
Flower meadows store rainwater because they are formed by plants with a widely developed root system.	Flower meadows produce the oxygen necessary for humans and other animals to breathe.	On a flower meadow we can grow and observe up to 60 species of plants!
Flower meadows provide us with a fabulously colorful space and beautiful fragrance.	The flower meadow gives animals a place to live, breed and shelter for the winter.	Flower meadows give us the opportunity to stay in the heart of nature, where people feel better.

Annex 2: Instructions for Group 1 preparing the ground for meadows:

1. Before starting work, prepare the necessary tools and other gardening aids (depending on the number of people working simultaneously), including shovels, rakes, hoes, string, wooden short stakes, rubber gloves and gardening shoes.
2. Start work in autumn or, if you don't manage to do so in time, in the spring immediately after the snow has melted.
3. Choose the right piece of garden or school yard, preferably sunny and not often trodden down by students.
4. If possible, choose a substrate that is nutrient-poor; if you do not have one, you can mix the soil with sand and clay.
5. Using a string and stakes, determine the area of any surface (e.g. 3m x 3m), depending on what kind of terrain you have.
6. Dig the soil (younger pupils can ask for help from a teacher, another school staff member or even involve their parents; older pupils dig the area themselves).
7. Clean the excavated surface layer of soil of grass, weeds and stones.
8. Using garden rakes, level the terrain, shred the soil and then clean it again.
9. Leave the prepared soil for a month (the work should be started in advance - preferably in mid-March, so that the sowing can take place in mid-April). After that time, clean the soil again of weeds.
10. If the soil is of very poor quality, you can add a layer of horticultural soil to the top (it can then be mixed with a little sand and clay).
11. Gently mark out the plot (e.g. with a hoe blade) – a square with an area of 1m x 1m.
12. The prepared plot is handed over to the second group.

Remember that all garden work should be done with gloves!

Annex 3: Flower meadow seeding card

1. **Preparation of the mixture to create a flowering meadow:**

   a. Grass species:

   –
   –
   –
   –

   b. Flowering plant species (from five to ten species or, if we have a large area, even more!):

   Try and choose melliferous species that attract bees and the species that attract butterflies.

   –
   –
   –
   –
   –
   –
   –
   –
   –
   –

   c. Butterfly plant species (improve soil parameters):

   –
   –
   –

2. **Instructions for preparing seeds and sowing meadows:**

   a. Preparation of the seed mixture:

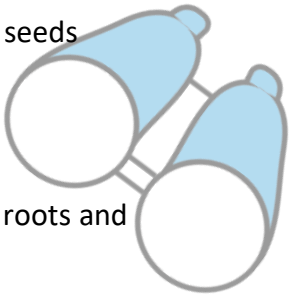
   Mixture ratio - 50 % grass seed to 50 % flower seed.

   Calculate the amount of seeds needed (2-4 g of seeds are needed per square meter):

   The field area is ..... m²

The amount of seeds you will use per m² = ...g

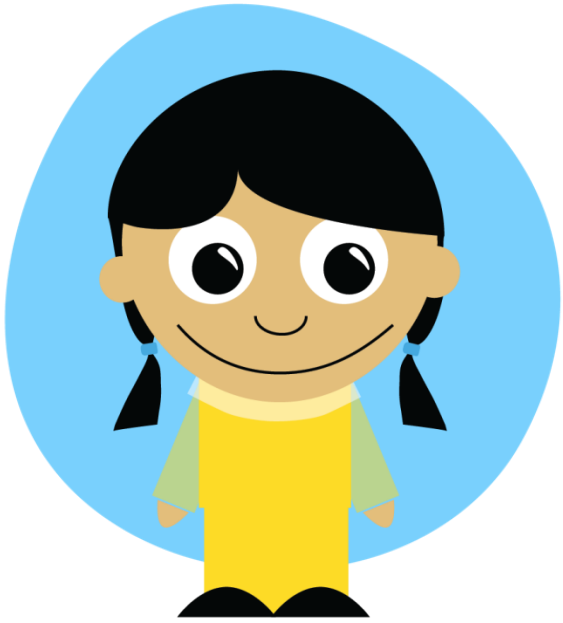
Required amount of seeds per meadow: ……m² X ……. g seeds = ……g seeds



b. Sowing:

1. If necessary, thoroughly re-clean the previously prepared soil from weeds, roots and pebbles and, if necessary, shred it thoroughly with a rake.
2. Sow the mixture evenly with 2 to 4 grams of seeds per square metre. The seeds can also be mixed with sand to make the sowing more even.
3. Don't bury seeds – Leave the seeds on top and compact the soil and seeds with the help of a garden roller or a board.
4. Don’t fertilize the soil!
5. Water the prepared area with a watering can or other equipment with a sprayer, taking care that the water jet does not knock the seeds out of the soil.
6. Remember that until the seeds germinate, the soil should be constantly moistened, preferably daily.

Note: Depending on your choice of flower species, some flowers will bloom in the same year, others in the next year or even in two years.



Suggestions for activities on the flower meadow

Exercise 1. Observation and counting of insects

- Divide the class into groups and use string to define squares with an area of about 1 m², so that each group has its own area to observe.
- For 20-30 minutes, students should look for insects that appear in their squares and record their number (we limit ourselves to winged insects, not including mosquitoes). As far as possible, pupils should also try to give the names of these species. This will allow you to determine which insects are most likely to sit on a particular plant species.

Example of an observation card

Plant species	Insects that most often sit on this plant

Exercise 2: Does a flower meadow have more inhabitants than a normal lawn?

- Divide the class into groups and use string to define squares with an area of about 1m², so that each group has its own area to observe.
- The same action is performed for a normal lawn.
- For 20-30 minutes, the students should watch for insects that appear on their meadow or lawn squares and record their number.
- The pupils should then compare the number of insects recorded in the flowerbed meadow and on a normal lawn, discuss their findings and draw conclusions.

Exercise options: Groups of students observe only the assigned areas (flower meadow or lawn) or change places after the same observation period.

Exercise 3: Use of web applications for the recognition of plants.

The "Atlas of Polish Plants" is a very good application for the recognition of plants. It is an excellent tool for young people to start exploring plants. The application contains over 2000 described species of herbaceous plants, shrubs and trees.

The application has the following functions:

- recognition of the plant on the basis of a photograph taken;
- recognition of plants by their structural features;
- creation of your own plant gallery (for the current project, plants growing in your school garden or flower meadow);
- finding the plant by name together with a set of information about it.

The use of the application is intuitive. Once installed, you can easily use it to complete the exercises, both on your own and in school.

The "Atlas of Polish Plants" application is free of charge. It can be downloaded from the Google Play store or from the website to both your desktop and mobile phone (Android).

Students use the app to photograph plants, making sure that the flowers or leaves are clearly visible in the picture, as shown in the attached illustration. A blurred image may cause the species to be mislabelled by the application program.

On the basis of the picture below, the program indicated the name of the shrub species.

Photo of the plant taken with the help of an application (photo: Katarzyna Komisarz)

Figure 3: A plant recognized by the program. Screen view

Other free applications for recognition of plants:

- Like That Garden
- Pl@nt Net
- My Garden Answers
- LeafSnap
- What's That Flower?

Exercise 4: Insects and arachnids living in our flower meadow

Students observe insects in the flower meadow. On the basis of their characteristic features, students should decide which systematic group the insects they observe belong to. They should perform this task with the help of a work card (Annex 1), placing in the appropriate line a drawing and description of the insect. In describing the species, the students should us an insect atlas, and can use special magnifying glass containers to capture the insects and get a closer look. A suction container can also be used to catch insects.

Attention: We remind the students that we handle insects carefully, and after observation and marking we release them into the wild.

Exercise 5. Flowering plants in the meadow

The students search for flowering plants in or around the meadow. They then do the exercise according to Annex 2 "Colourful meadow flowers". Within their respective frames, they should draw selected flowers in white, yellow/orange, blue/violet and pink/red. The students should then look for and sign the names of the plants they have painted in the available sources of information.

Exercise 6. Meadow landscape

Students paint a meadow on a piece of paper using watercolour crayons. You can spend a whole day doing this task! Then, together with the teacher, they should prepare an exhibition of their work. You can invite parents to paint the landscape of the meadows together and organize a family picnic called "The Meadows of the World" or "Meadow landscapes", for example, on Mother's Day.

Annex 1: Insects and arachnids on our flower meadow.

Watch the insects in the flowering meadow and complete the table.

Example of an insect or arachnid	Drawing and brief description
Blue-winged bees e.g. bees, wasps, flies, ants Name: ……	
Winged scales (day and night butterflies) Name: ……..	
Rectangular (e.g. grasshoppers and other insects similar to grasshoppers) Name: ……	
Bed bugs (e.g. blacksmith without wings and other insects similar to it) Name: ……	
Beetles (e.g. ladybug and other insects similar to it) Name: ……..	
Arachnids (spiders and the like, have four pairs of legs) Name: ……	
Other invertebrates observed Name:……	

Annex 2: Coloured meadow flowers

1. In the frames, paint the plants you have seen in the flower meadows.
2. Using various sources of information (e.g. plant atlases, web applications or other) and with the help of a teacher, name and sign the species of plants you have painted.

Flowering in white

Species…… name .

Flowering yellow or orange in bloom

Species…… name .

Blooming pink or red

Species…… name .

Flowering blue or violet in colour

Species…… name .

Topic: From seed to seed

Duration: From the beginning of March to the end of June (Northern European seasons)

Age group: 9-11 years old

Aim:

1. Development of natural observation skills.
2. Learning how to grow garden plants;
3. Getting to know the structure and functioning of herbaceous plants.

Materials and aids:

- velvet seeds (different species and varieties) - minimum 5 varieties, 2 packs each;
- A3 cardboard boxes for posters;
- book publications, plant atlases and websites containing information on velvets, their cultivation and care;
- seedbeds made according to your own idea (e.g. from toilet paper rolls or other materials) or balcony boxes;
- horticultural land;
- gardening tools (shovels, rakes, hoes, watering cans);
- rubber gloves

Important remarks for implementation:

Keep in mind that weather or soil conditions can delay flowering; then you have to wait until September to harvest the seeds. The best time to start the project is at the beginning of March.

Course:

Task 1: Project preparation - first week of March

Discussion of the subject matter and schedule of the project. Students should prepare all necessary aids and materials for the project. The students should be divided into four-person teams, in which they will work until the end of the project.

Task 2: Purchase of seeds - first week of March

Each team is given seeds of different species or varieties of velvet (there are several dozen varieties of these plants available on the horticultural market) by the teacher (or they buy them themselves). Each group should have seeds of a different species (e.g. raised, scattered, narrow-leaved and low velvet) or colour variety. Velvet seeds can be bought in: gardening shops, OBI, CASTORAMA or online shops, e.g.
https://sklep.swiatkwiatow.pl/nasiona-aksamitki

Examples of velvet species

Velvet raised in orange

Velvet low vanilla velvet

This velvet has scattered red

Task 3: Preparation and presentation of posters by 15th March

Each team prepares a poster (examples in Appendix 1) in which they present information about their velvet plant. Pupils can glue on photos or draw their own variety. The poster should also contain basic information about the structure of the plant, how it breeds and interesting facts (e.g. that petals of different species of velvet are used for culinary purposes, but each variety is used for a different kind of food).

In addition, you can suggest labelling all parts of the plant and briefly describing their functions, so that the pupils become aware that the flower is used for plant propagation.
Each poster should be have transparent tape attached to it, gluing several seeds of a given type of velvet to the poster.

After the posters have been prepared, they should be presented in front of the class.

Useful web pages for information of velvet plants:

- https://hortulus-spectabilis.com.pl/wydarzenia/187-aksamitka
- https://www.werandacountry.pl/w-ogrodzie/17062-aksamitka-kwiat-dziewieciu-imion?cid=5
- http://ogrodniedoskonaly.blogspot.com/2017/10/zbieranie-nasion-aksamitek.html
- https://zielonyogrodek.pl/katalog-roslin/jednoroczne-dwuletnie/9710-aksamitka

Task 4: Keeping a breeding logbook - from sowing to harvesting and drying of seeds

Each group documents the progress of breeding - take photographs or drawings showing the next stages of plant development and pastes them into the breeding log (attachment 2).

Task 5: Sowing - second half of March

In mid-March, each team should sow its seeds into seedbeds filled with horticultural soil and then mark their seedbeds with an inscription detailing the name of the species or a label from the seed packaging.

In each compartment of the seedbed, make a hole in the plates, insert one seed and cover it gently with soil. If a box is used, it is best to sow each seed at a distance of at least 8 cm to avoid overgrowing seedlings.

Task 6: Care of breeding - from sowing to 15th May

Each team should take care of the breeding and watering of their young plants. Seedlings should stand in quite a sunny place (most species can also tolerate partial shade).

Seed sowing for seedbeds, photo: Katarzyna Commissioner

Young velvet seedlings about 2 weeks after sowing, photo: Katarzyna Komisarz.

Task 7: Preparation of a bed in the garden and transplanting plants to the ground - shortly after 15th May

In mid-May, begin preparing a patch in the garden. If the soil was dug up in autumn, you can dig it up again, remove weeds, sticks and stones, and shred and level with a garden rake. Plants must be carefully removed from the seedbeds so as not to damage the roots (preferably with a spoon or stick).

Each team should transplant their seedlings at a distance of at least 10 centimetres so that the individual plants have their own space. Remember to label each row with labels from the seed packages.

In order to make the whole bed clear, the planting distances of the individual units should be at least 40 cm.

Cuttings ready to be transplanted into the ground (without flowers yet)

Sapling ready for transplanting to the ground (after flowering)
Photo. Katarzyna Commissioner

Task 8: Plant care - from transfer to the ground to the end of the project

Students should water the bed at least once a day and make sure that weeds do not overgrow the beds.

In June, depending on weather conditions and velvet varieties, the first flowers should appear. In some cases, flowers may appear before the seedlings are transplanted into the ground.

Various species of velvet in the garden

Task 9: Flower observation and seed harvesting - second half of June

Students should watch closely which flowers have bloomed and thrown off their petals. The seeds will be enclosed in oblong scales that have been left over from the blooming flowers. You can wait until the seed husk is quite dry and then get it off. From the scales we pour the seeds into small containers. If the pupils are unsure about the appearance of the seeds, they can compare them with the ones they have previously glued to the posters.

Velvet seed after harvest (photo. Katarzyna Commissioner)

Task 10: Drying of seeds

Open containers containing seeds from husks should be placed in a dry and slightly ventilated place and should be mixed daily. Moisture can cause the seeds to mould.

Once the seeds are completely dry, students should stick some onto their poster to compare them with the ones they planted in the seedbeds in March. The remaining seeds are then sealed in containers or paper envelopes, signed and put aside for another year.

Project summary:

After completing the tasks, you can summarize the project. The teams can present their posters, share their impressions of the work process and formulate conclusions on their own or with the help of a teacher. The posters can be used by students to prepare an exhibition in the classroom or in the school corridor.

Additional activities:

- You can create a colourful mosaic from the seedlings that the pupils transfer to the ground in May.
- Progress in breeding can be regularly posted on the school website.
- The obtained seeds can be sown in the next school year or given to parents, teachers or other students.
- Seeds can also be sold in the school shop and the money from the sale can be donated to charity or classroom needs.
- At the end of June, when all the flowers are in bloom, you can invite parents for tea in the garden, for example on Father's Day.

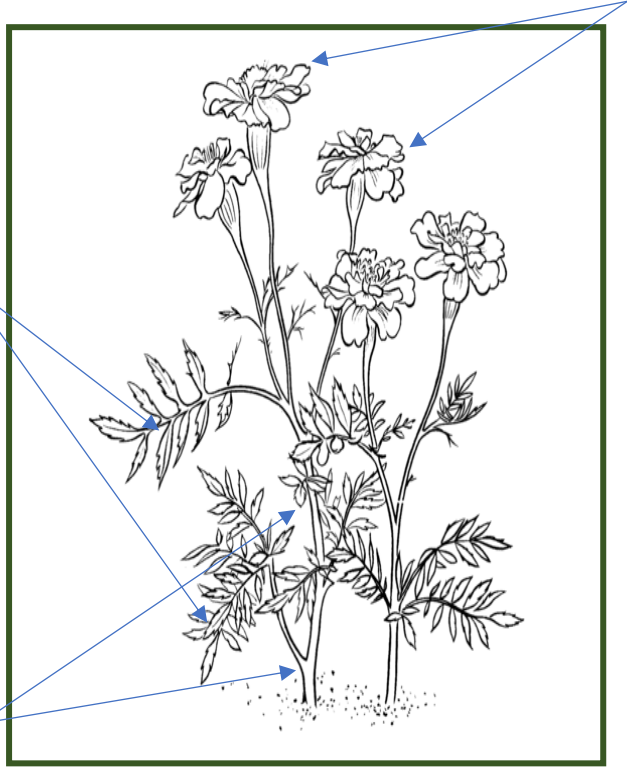
Annex 1 - Proposed form of poster

Enter the name of the velvet species and its variety here,
e.g. velvet scattered Carmen - brown

Space for drawing plants

flowers

foliage



stem

Here we paste a label cut out of the seed package

Here we enter the basic information about the selected velvet species and interesting facts

Leaf functions: ……
……

Stem functions: ……
…… .

Flower functions: ……
…… .

Here we glue a few seeds, among those intended for sowing, with a transparent adhesive tape.

Here we stick a few seeds, which have been collected from the culture, with the use of transparent adhesive tape.

Annex 2 - Velvet-breeding logbook

Species ……

Event	Date	Photo or drawing	Remarks
Seed sowing to the seed drill			
Appearance of seedlings			
Transplanting plants from seedbeds to the ground			
Flowering of the first flowers			
Harvesting of the first flowering flowers with seeds			
Drying of seeds			

Topic: Gifts for garden friends

Duration: minimum 4 hours

Age group: 9-13 years

Aims:

1. Getting to know the species of animals that can inhabit the garden or other green spaces surrounding the school.
2. Getting to know the needs of these animals.
3. Involvement of students in the creation of an animal-friendly green corner.
4. Creation of a place for observing nature.

Materials and aids:

- envelopes containing labelled photographs of animals we want to invite to the school environment.
- Cards with illustrations of "gifts" - garden elements attracting selected animal species (Annex 2).
- Materials needed to make "gifts" for animals or purchased ready-made items (e.g. hedgehog houses, hotels for insects, drinking troughs for birds, etc.);
- Blankets and refreshments for picnic guests;
- Decorative sheets of A4 format for 'invitations' for animals (according to the teacher's idea).

Important remarks for implementation: Devices and objects favouring the presence of selected species of animals in the garden can be made by the pupils themselves or they can buy materials from which they will then prepare them. You can also buy ready-made houses for hedgehogs and insects in the garden shop.

In order to raise money to buy houses or materials for them, the class can organise the following events: a fundraiser, a cake market or other home-made treats. You can also try to get a sponsor from local donors, in which case you should place a donor information sign in the garden. Thanks to the sponsor should also be posted on the school's website.

Course:

1. The teacher and the students go out to the garden or to another green corner near the school. At the entrance, students find a letter, rolled up, tied with a ribbon or placed in a large envelope. One of the students reads it out loud. Example of the content of the letter:

Dear Friends of Nature!

A school garden is not only about the plants growing here. It is a place of life for many species of animals, small and large, sometimes unnoticeable to us, and sometimes even the opposite – as we enjoy their voice and colourful appearance. These are the good and hardworking spirits of this garden, thanks to which a harmonious life takes place here. Some of them pollinate flowers so that we have fruit and vegetables, others spread seeds, and others decompose the dead parts of plants and fungi. Let's remember! Birds, hedgehogs, ladybirds, butterflies, bees, bumblebees or even wasps are important animals in the garden, they are our friends.

Let us provide them with good living conditions so that they can live in our neighborhood!

Every animal needs shelter. You can help birds by mounting nest boxes for them or feeding them during cold winters. It is good for all animals to have access to water by putting watering cans in place. This makes them all the more eager to visit this garden; feeling safe in it, they will return the favor by singing, allowing us to observe them and learn their secrets.

Let's create a house in the garden for our friends and invite them to join us!

Mother Nature

2. Before the lesson, the teacher lays out colourful envelopes in various places in the garden, in which there are pieces of paper with the names and images of animals that may inhabit the garden area (attachment 1). Here are the proposed animals:
    - European hedgehog
    - butterflies
    - swift
    - birds living in the garden (e.g. blackbirds, starlings, tits, sparrows, etc.)
    - insects (e.g. masonry bees, gold-eyes, ladybirds, bumblebees)

    You can also select other groups of animals or limit yourself to a smaller number of animals. An interesting option may also be the construction of a house for bats, but we often have to wait several years for such a resident.

    After reading the letter, the teacher should divide the students into five-person teams – Each team then selects one of the envelopes, opens it and reads the name of the animal or group of animals for which it will create the gift.

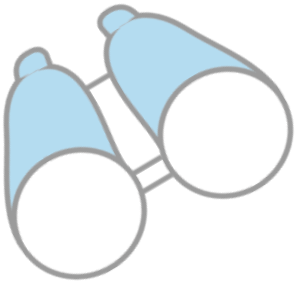
3. After determining the tasks for each team, the teacher should show the students the following charts showing the presents for the animals (attachment 2). Students should take the appropriate board and stick an illustration of their animal on it
    - Hotel for insects (ladybirds, bumblebees, wild bees, silverfish);
    - watering trough and bird feeder;
    - nesting box for swifts;
    - a wild corner with flowers attracting butterflies;

- a wicker house for a hedgehog.

On the other side of the boards you will find a short information section about the animals and a suggested place where you can set up a garden element prepared for them. Students read out aloud the information on the back of the card.

4. The task of each group over the course of the week is to prepare short presentations about their animals, including their role in nature, using various sources of information.
5. During the week, students need to learn how to make "gifts" for animals and obtain the materials needed to make them. The teacher should also give them instructions on how to build a simple insect house (attachment 3).
6. After this time, each team presents the information they have collected to the other students.
7. If you want to assemble insect houses and other equipment for animals yourself, you should spend at least two hours on it. You can also invite parents to help! It is also possible to purchase ready-made items if agreed upon in advance.
8. At the end of the project, organize a class picnic during which you assemble in the garden the equipment prepared for the animals. To make it more ceremonial, you can tie a ribbon on each of them. Students can also prepare and read symbolic invitations for animals to settle in and use the installed gifts.

   For the picnic you can invite all of the people who helped to arrange the garden.



Annex 1: Photographs of animals (insert in envelopes)

European hedgehog

Swift

European peacock

Red Admiral

Clouded Yellow

Great Tit

Blackbird

Starling

Sparrow

Ladybug, seven dot.

Lacewing

Mason Bee

Bumblebee

The photos come from the following websites: ekologia.pl, poradnikzdrowie.pl, mojogrod.pl, dinoanimals.pl, otopjunior.org.pl, apoczywaj.pl, wikipedia.pl, jestemnaptak.pl, medianauka.pl, zwierzetainformacje.pl, swiatmakrodotcom.wordpress.com.pl

Annex 2: Gifts for animals (charts to be printed)

The hedgehog house

Hedgehogs live mainly in mixed forests and groves, but are also increasingly seen in urban gardens. For hedgehogs, we build a wicker house or prepare a cosy den in a garden composter.

Where to put the house?

- The hedgehog house should be placed in a less frequented and quiet place in the garden; it should be covered with fallen leaves or garden compost.
- We should protect the houses from house cats, which can be dangerous for hedgehogs.

Hotel for insects

In the past, certain groups of insects (e.g. masonry bees, golden bees, bumblebees) found shelter and nested in straw thatched roofs, nooks and crannies between bricks or beams, cellars or attics. Nowadays, because of concrete buildings, they have lost their place to live. However, we can easily help them by building houses for them. Insects pollinating flowers will gladly colonize these houses and our garden will benefit from it.
Where to put the hotel:

- in a place sheltered from rain and wind;
- in a quiet and sunny space on the south or south-eastern side of the building;
- under a roof, a wide gutter, inside a gazebo, under a shelter or between trees.

Watering troughs and bird feeders

In summer, when temperatures are high, birds visiting gardens (e.g. blackbirds, starlings, tits, sparrows, robins) are exposed to dehydration and overheating. Especially in big cities, they have fewer and fewer places where they can satisfy their thirst or cool off. Water is not only needed for birds to drink, but also to keep their feathers in good condition.

A place to drink will make it easier for our guests to survive the heat. Hedgehogs and insects will enjoy using it too!

Where and how to place the drinker:

– Place the drinking trough in a secluded and quiet place.
– Place them in the shade, as on hot days the water evaporates quickly from a shallow container.
– Birds must have free access to water - the drinker must not be too deep and it is best to place a pebble in the middle of the vessel, on which the birds will be able to stand freely.
– There should be no dense vegetation in the vicinity of the drinking trough in which a hunting predator could hide.

Corner with flowers luring butterflies and seed mixture ready for sowing

Butterflies are beautiful visitors to the garden; besides, just like bees, they pollinate flowers, so it is worth inviting them to the garden.

Where to create a butterfly corner?

Spread a bed in the garden, on which you can sow as many species of flowers as you like; you can also sow seeds directly on the grass right after mowing. The seeds can be mixed with sand to spread evenly.

Proposed plants for attracting butterflies include *primroses, asters, medical lavender, permanent "blue" flax, great gold-plated, common daisy, yarrow, white clover, blood red clover, verbena, seaside smagrel, hairy red, marigold, fragrant violet, white gilt, velvet scattered.*

NOTE: If you have a secluded corner among flowers, you can also put there a small house for butterflies.

Swift box

Swifts live in buildings in old housing estates, using existing ventilation openings and flat roofs. Unfortunately, when insulating buildings and building new blocks of flats, these openings are closed with plastic grilles, thereby preventing swifts from accessing their only habitat and breeding sites. There are fewer and fewer places for swifts in cities and if we do not protect them, their number may decrease significantly.

Where do I hang a nest box?

We hang nesting boxes for swifts on buildings. It is important that there are no obstacles around the box or a few meters below it (at least 3 meters), that could be in the way for these birds flying at high speed. We choose a place that is sunny and sheltered from the rain. It is best to hang more than one shelter, because these birds like to live in colonies.

Photos and ideas used in the annex come from the following websites: stylowi.pl, semini.pl, zogrodemnaty.pl, mkwpracownia.pl, wiliezycie.pl, czaszdziecmi.pl

Attachment 3: We're building a hotel for insects.

1. Why build insect houses?

   In the past, certain groups of insects (e.g. masonry bees, golden bees, bumblebees) found shelter and nested in straw thatched roofs, nooks and crannies between bricks or beams, cellars or attics. Nowadays, the construction of concrete buildings has resulted in them losing their places to live. Remember, however, that we can easily help them by building houses for them. Our garden will benefit from that.

2. How to build an insect house? It's easy!

   I. Required materials:

   a. Depending on what kind of insects we want to host, we compile:
      - for wild bees and wasps: bamboo stems, hollow or grill bricks (crevices not wider than 12 mm), drilled branches;
      - for ladybirds: pine or spruce cones and dry leaves;
      - for Hoverfly: straight stems, e.g. elderberries, blackberries, raspberries;
      - for bumblebees: dry moss.

   b. A 1 metre long, half-cut board, preferably made of hardwood or dried coniferous trees - intended for a roof.

   c. Board or dry bark on the base of the cottage.

   d. Small boards or dry sheets of bark for shelves.

   e. Hole brick or grate.

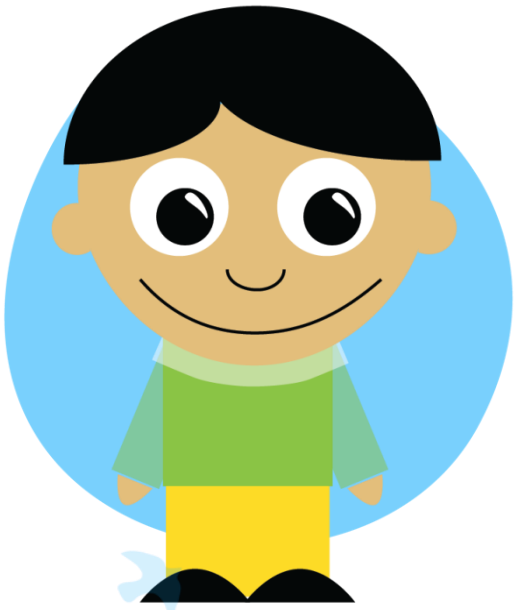
   f. Drilling machine with drill bits from 4 to 7 mm in diameter.

   g. Nails.

   h. Scissors.

   i. A string.

   j. A ruler.



Materials collected for the construction of the cottage, photo: Katarzyna Komisarz

II. Preparation of habitat for insects

1) We cut reeds and other twigs to a minimum length of 15 cm.

Cutting branches with rulers and scissors, photo: Katarzyna Komisarz.

2) Adults should help the children to drill holes in pieces of branches. The holes should be drilled to a depth of 6-10 cm.

Drilling holes in branches, photo: Katarzyna Komisarz

III. Folding of the structure

The boards should be merged so that they form a roof, which you can set on a wooden base. Wooden shelves should be cut after the main structure has been assembled. Shelves can also be made from pieces of bark (necessarily dry), which is easier to break and fit.

IV. Cottage decoration

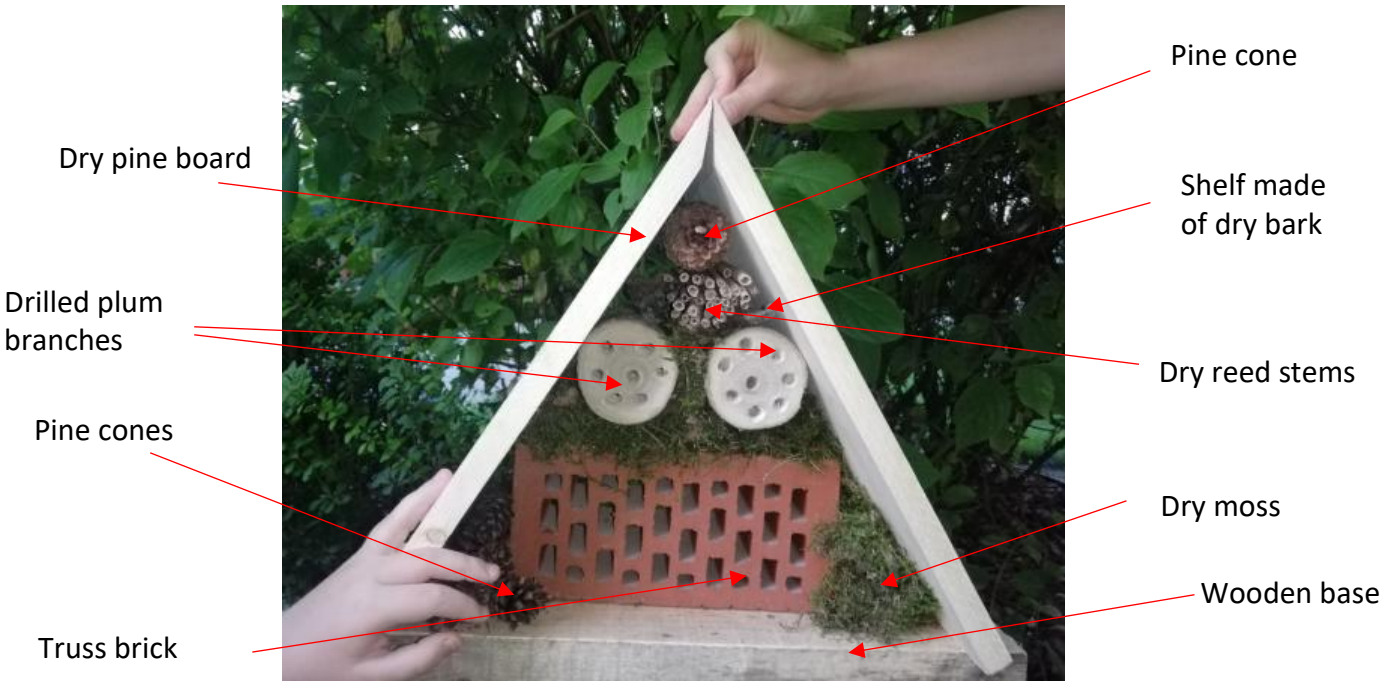
All components can be arranged in any configuration. The free space can be stuffed with dry moss, which will be the bumblebee house.

Attention: Cover the front of the hotel with a thin metal net to prevent birds from entering the insect-inhabited area.

Arrangement of the hotel for insects, photo: Katarzyna Komisarz

V. Where in the garden to put the insect hotel?

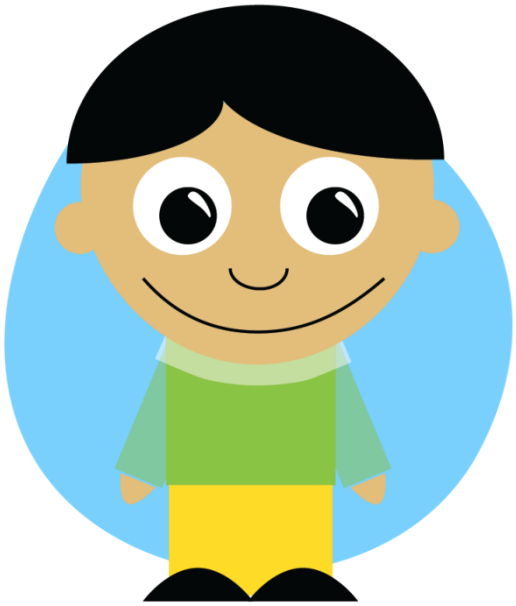
- a place sheltered from rain and wind;
- A quiet and sunny space on the south or southeast side of the building;
- under a roof, a wide gutter, inside a gazebo, under a shelter, between trees.



A completed hotel for insects located in the garden in the midst of bushes, Phot. Katarzyna Commissioner

VI. When will insects use the houses?

- In spring, to lay eggs.
- In autumn and winter - to overwinter.
- In the summer - to have accommodation and shelter.



Topic: Nature and its components. Let's take a look at the soil.

Duration: 1 hour

Age group: class 3-5 (9-11 years)

Targets:

1. Getting to know the elements of animated nature, inanimate nature and the products of human activity in the school garden and near the school.
2. Knowledge of the composition of the upper soil layer.
3. Development of natural observation skills.

Materials and aids:

- Work Card (Annex 1);
- pencil, 2 pens (black and green);
- petri dishes at least 14 cm in diameter with a lid;
- spatulas or wooden sticks, e.g. for shashlikes;
- magnifiers (additionally also a microscope - students will discover the world of soil microorganisms);
- rubber gloves.

Important remarks for implementation:

Pupils should wear protective gloves during the soil investigation (Annex 1, task 2).

Course:

1. In the introduction, the teacher briefly presents the following concepts: nature, animated elements and inanimate elements of nature. They should also inform the students that not everything that surrounds us is an element of nature (products of human activity).
2. Students are divided into four-person teams and the teacher hands one work card to each group (attachment 1).
3. During a short walk in the school garden, the pupils should carefully observe their surroundings and carry out task 1 on the work card. They should write in the appropriate places of the table the noticed elements of animated and inanimate nature and the products of human activity.
4. After completion of the work, the representatives of each group should read their entries in the table. If necessary, the teacher can correct any errors.
5. The teacher should inform the students that soil is a special element of the natural world; its composition is rich. They will also asks pupils what elements of nature they have included or, if they have not included it in the work card, they could ask students whether they would include soil, and whether it can be considered a creature situated on the borderline of the animated and inanimate world.
6. To answer this question, the students perform task 2 in the worksheet. They take enough soil from the Petri dish to cover almost the entire bottom. They can, if there is enough time and the soil is still damp, close the dish for a while - then steam may appear on its

walls. The sample may also be partially poured onto a white sheet if this facilitates observation.

7. With the naked eye and a magnifying glass, the pupils should carefully examine the soil composition and draw the observed elements with a pencil on their worksheet.
   What answers can be given? What are we going to find in the soil?
   - Living animals and organisms (inform the students that living organisms occurring in the soil enable the decomposition of organic compounds and accelerate the release of minerals, as well as the formation of soil humus)
   - algae
   - partially decomposed plant debris, e.g. leaves, roots, stems (humus)
   - crumbs of rock or pebbles
   - sand
   - loam
   - parts of dry twigs
   - water
   - steam
   - air (between soil components)
   - other
8. Based on the results of their observations, the pupils can then discuss briefly and express their opinions on whether the soil is really a natural element on the border between the living and inanimate worlds. They can then write their conclusions on a work card.
9. Summary – Students list the elements of nature or the products of human activity that they like the most and the least. How do they see the school garden area in the future? Which elements of that environment could be expanded, and which could be reduced?

Annex 1

Task 1

Take a look at your surroundings and then put as many elements of animated and inanimate nature as possible into the appropriate windows, as well as examples of human activity.

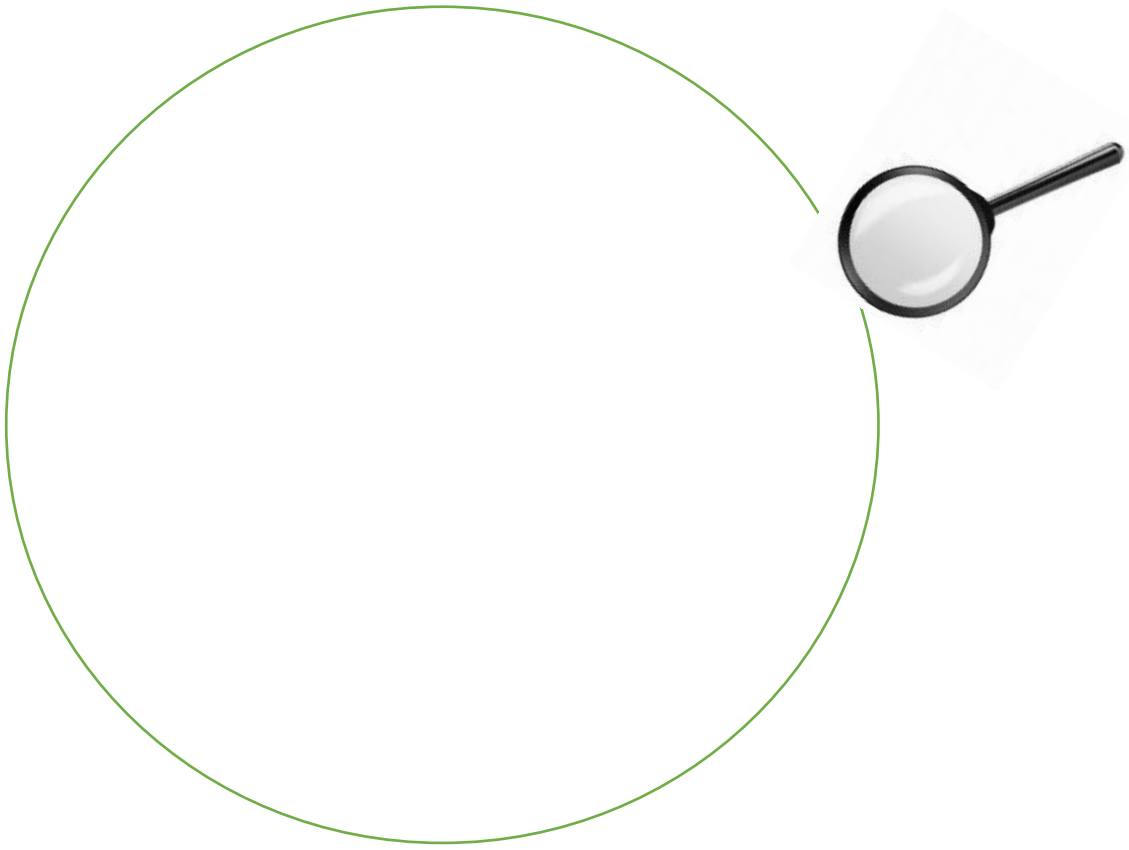
Components of animated nature	Components of inanimate nature	Human activity products
Hint: These are objects that show features of life, such as: nutrition, breathing, excretion, movement, reproduction, growth and development. It's plants, animals, fungi, bacteria, protists.	Hint: These are all other components of nature that do not show the characteristics of life. They are not man-made either.	Hint: They are objects created by people and therefore not classified as part of nature.

Task 2

Wear rubber gloves on your hands before performing the task.

Instructions:

1. Take a soil sample from the garden to cover almost the entire bottom of the pan.
2. Crush the material with a spatula or stick.
3. Using a magnifying glass and the naked eye, perform a thorough observation of the soil sample.
4. In the circle below, use a pencil to sketch out all the elements you have observed in the sample. Label the elements of inanimate nature with a black color, while the elements of animated nature should be labelled with a green color.



5. After the observation, pour the soil into the place from which it was taken. You can leave a small soil sample for additional observation under a classroom microscope.

APPLICATION:

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Topic: Big search. Attention training in the garden

Duration: 1 hour

Age group: classes 1-8 (7-14)

Targets:

1. Perceptive and attentive exercise.
2. Developing sensitivity to nature.

Materials and aids:

- everything that's in the school garden;
- Depending on the choice of exercises, magnifiers, card holders, painting cards, watercolor crayons or other colouring books may be useful: *"Landscapes. Practicing Attention through the Art of Colouring" by* Joe Bright, wicker basket, string (about 20 meters), cameras or camera phones, blankets to sit on the grass.

Important remarks for implementation:

By nature, children are curious about the surrounding natural world. They experience their surroundings with all of their senses, although they are not always aware of it. An increasing number of stimuli coming from the world (colorful billboards, flickering advertisements, television, computer, phones) often makes children distracted and nervous. They are less likely now to stop with delight at a beautiful, spreading tree or ordinary fence overgrown with lush grapevine, or even a pebble lying on the road. Attention helps children and adults to see again how much uniqueness is hidden in the everyday world.

Use the garden or green space around the school to improve both students understanding of nature and their attention. This will certainly help them to cope with nervousness, stress and haste over time. In attentiveness exercises, students learn to focus on what is here and now, without thinking about the future or the past.

Nature is the best teacher of attention!

Course:

Attention exercises can be performed in the natural environment, including in the school garden or in green surroundings of the school (e.g. on a nearby meadow, in a forest or in a park).

Lessons can be taught once a month, once a week or even more often by doing a different set of exercises each time or repeating the same ones. Exercises can also be modified according to the needs – e.g. age of the children, garden size, garden equipment or other circumstances.

Suggestions for attentiveness exercises in the school garden

Exercise 1: Conscious breathing

At the beginning and end of the class, you can do a breathing exercise with the students to help them concentrate, relax and oxygenate more.

Students sit on the grass or stand slightly apart, then close their eyes and put both hands on their diaphragm. The exercise consists in very slowly taking ten deep breaths and exhales. The teacher instructs the students to focus on the breath itself (let them feel the air flowing into their noses and out of the mouths, the diaphragm shrinking and dilating, the air flowing from the nose down to the lungs). If their thoughts deviate to other things during the exercise, let them try to return their attention to their breathing. During the exercise, the teacher should repeat loudly: *"Inhale - Breathe out"*, so that students can focus only on breathing (not on counting).

Exercise 2: A careful photographer

To practice this exercise, you need cameras - one per group, or each student can use the camera on their phone.

1. Divide students into 3- or 4-person groups.
2. In the garden, use a string to mark an area about 1.5m x 1.5m x 1.5m in size. One surface will serve only one group. Areas can be created in various places, e.g. on a fence overgrown with grapevine, on a large tree crown, on a thick trunk or on a piece of lawn. The size and shape of the determined areas are adjusted to the possibilities of the garden.
3. Students take pictures only on their own designated surface. Each group takes about 10 different photographs, either from a close up or from a further perspective, so that each photo has a different image.
4. After the exercise, the pupils share the captured images.

You can perform the exercise again by swapping the areas to be photographed between groups. Students learn to perceive the various elements of nature in this way and are more likely to pay attention to them.

Additional action:

Photographs can be used to create mosaics with the help of a special computer application or to create an exhibition of photographs titled "The Mosaics of the World" or "The diversity of nature in our garden."

Mosaic of photographs taken on a separate square of a fence overgrown with creeper (photos and mosaic: Katarzyna Komisarz)

Exercise 3: Search

The teacher asks the students to find any three elements of nature possessing the characteristics indicated by the teacher, for example: something that emits a smell, something hard, something green. Students have two minutes to complete the task. We suggest that students do not talk to each other during the search, but rather focus on the task at hand.

After completing the exercise, the selected students must present their findings or mention the objects name and indicate to other pupils where they are in the garden, which will reduce the number of plants being picked in the garden.

Exercise 4: We examine the tree

Students stand close to a tree or, if possible, in small groups at several trees. The teacher suggests that with the help of touch, smell, hearing and sight they examine the tree, look at it carefully and exchange as many tree characteristics as possible (e.g. rough, dry, smells of bark, noises, etc.). Each pupil individually lists the characteristics they observe, potentially writing these qualities on cards.

Students can also note the presence of lichens on the bark or any small insects occupying the tree.

Most often, after doing this exercise several times at certain intervals, the pupils list more and more features that they hadn't noticed before, such as the presence of insects or birds on the trunk or in the branches of a tree.

You can also do this exercise by describing shrubs or other herbaceous plants, such as malvae or sunflowers.

Students exploring the tree, photo: Katarzyna Komisarz

Exercise 5: Listening to the surroundings

The pupils sit in a circle so as not to touch each other, and then close their eyes. The teacher asks them to listen to what is happening around them for 3 minutes in a still position. After that period of time, the students share their insights.

Note: Often at the beginning of this practice students only hear the sounds of cars, planes, the movements of the colleague sitting next to them, but over time they also catch more and more of the sounds of nature: the singing of different species of birds, the sounds of insects, the sound of trees in the wind, and so on.

Exercise 6: Careful walking

The teacher goes with the students to the garden or nearby park and invites them to take a careful stroll. During the warm months, if we are sure that the area is free of glass and other sharp debris, children can take off their shoes.

Before the walk, the teacher instructs the students what they should pay special attention to:

1. Collect all information from the environment with the help of the senses: sounds in the area, landscape colours, smells, humidity, wind blowing on their skin and more.
2. Receive sensations from inside the body: e.g. leg pain, tension, fatigue, hunger. If you don't feel anything, register it too.
3. Just walk and be aware of what and how you are feeling. You can pay attention to what you feel in your calf muscles, when you bend your foot, how your heel is pressed against the ground, what you feel under your feet. Pay attention to the movements of your chest when you breathe.

4. Walk around and be careful to notice. Be truly present here and now. Really see flowers or leaf buds on branches, attentively listen to birds singing or trees rustle, really feel the tickling of the grass, the drops of rain on your face, the noise of wind in your ears.

The execution of each point may take about 3-5 minutes depending on the age of the children. It is important that the pupils focus on walking during the exercise. Such a walk can take place every day in the garden or in a different place close to nature. At the end, the pupils can sit down and share their impressions from the walk.

After a few exercises, the pupils no longer need to be reminded of the instructions, they themselves implement the method of careful walking.

Exercise 7: Pay attention

Students walk in the garden, looking closely at the surroundings, especially at what is under their feet. During the walk they collect five elements of animated or inanimate nature that they would never have noticed before, e.g. a broken stick, a pebble, a leaf bitten by a caterpillar, dry needles, a blade of grass and others. Then, on white sheets of paper, or preferably on a large dry leaf, they arrange a mosaic of collected elements and present their works to each other.

Mosaic made of natural elements found during the walk,
photo: Katarzyna Komisarz

Exercise 8: Colours of nature

The pupils walk for five minutes through the garden and look for different elements of nature. They can then write the names and colours of what they find on sheets of paper. Each student does the exercise on their own.

Examples of notations that can appear in notes: orange velvet blossom, green leaves of a wild rose, grey stone, brown stick, transparent or greenish water in a puddle, white mushroom, etc., can be found in notes to this web page.

Everyone should try to save at least ten items.

If the names of the plants in the garden are not known to the students, they can ask the teacher about them or just type in: orange flower, green leaf, etc.

Exercise 9: Garden landscapes

Students sit on blankets in comfortable positions and paint a chosen part of the garden with crayons or paints. It does not have to be a faithful representation of the landscape, but an image as seen by the student. You could then do a classroom exhibit of the work!

Instead of painting on a white sheet of paper, you can also use colouring books with images containing elemants of nature – e.g. *"Landscapes. Practicing Attention through the Art of Colouring" by* Joe Bright.

Being involved in the creative process helps students to be in the present and painting or colouring is an excellent exercise of attention for children, young people and adults.

Exercise 10: The gifts of nature - what is hidden in the basket?

This exercise is best done in autumn or at any other time if you have different fruits and vegetables grown in greenhouses.

Gifts of nature (e.g. apple, carrot, cone, chestnut, pebble, stick, dry leaf, pine needle, a piece of bark or any other element offered by nature) can be placed in a wicker basket, which can then be covered with a cloth. Each pupil can then be asked to put their hand into it, choose one thing without taking it out and describe it in as many details as possible.

A few baskets can be prepared and divided between the groups so that the students have as much time as possible to do the exercise calmly.

Additional activities:

- Students can create their own attentiveness exercises in the garden and then conduct them with other students in the classroom.
- Suggestions for exercises can be collected and hung in the form of a newspaper in the school corridor, thus encouraging others to exercise attention in close contact with nature.
- You can organise a class or school event called "Attention Day in the Garden", inviting parents and/or other schoolmates to attend.

Topic: Life underfoot.

Duration: 3-4 hours (the time depends on the classes)

Age group: classes 1-3 (7-9 years)

Targets:

1. Developing the ability to formulate thematic statements.
2. Development of the senses - sight and touch.
3. Improvement of perceptive and attentive skills.
4. Enriching the children's dictionary with adjectives.

Materials and aids:

- white A4 cards (preferably from a technical block), one for each student;
- drawing or writing pads (e.g. the back of a block with a paper clip to attach a sheet of paper);
- white A4 cards, one for each pupil; if pupils write free text in the task at point 6 and not just tell the story, a second card will be needed;
- a pencil for each child and crayons if children draw a 'picture';
- a camera, if there are pictures of "images" taken under the foot in point 5;
- paper towel to wipe the legs after going through the sensory path in task 2.

Course:

1. Introduction
   - The teacher asks:

   Is there a life underfoot? - Pupils respond and the teacher listens to what is being said without commenting on what the students are saying. Once the ideas have been exhausted, the teacher should suggest that the children check it out. Students draw their feet on an A4 sheet of paper and then cut them out in such a way that they do not cut the sheet of paper and the cut out foot is intact.
   - The teacher invites the children to the garden.
2. Sensory pathway
   - Students take off their shoes, line up behind the teacher and follow them around the garden. The teacher leads the students through a variety of places that provides them ith a different sensory experiences on their feet. It is worth to choosing surfaces so that the children can feel warmth, cold, roughness, softness, delicacy, sharpness. After the walk, the group sits in a circle and shares their impressions, telling them what their feet felt like, which place in the garden was the most pleasant and which was the least pleasant for them. After the conversation is over, we wipe our feet and put our shoes on.
3. What's hidden beneath my foot?
   - Each pupil looks for a place in the garden and puts his or her foot on it. The task of the rest of the children is to guess what's hidden under the feet of a colleague. If you have

a very large group, you can divide it into teams and after a short instruction how to do the exercise, you can do it in teams. Finally, we ask each team to choose one "foot" with the most interesting objects hidden under it. Then with the whole class we watch only the places chosen by the teams.

4. Colours underfoot
   - Invite students to play "Colour hunting underfoot". In this activity, a child gives the name of a colour and the other children attempt to put their feet in a place where they can find that colour underneath. If you want to involve the touch sense more or develop a children's dictionary, you can modify the exercise by asking children to put their feet on something wet, slippery, cold, etc.
   - Each student is given the task of collecting 5 colors under his or her foot. The teacher informs them that the plants must not be uprooted during this task. Children can put some objects on a paper foot or rub some colour on it, e.g. by placing a cardboard foot on a blade of grass or clods of earth. After the work has been done, they show it to the teacher and colleagues.

5. Find life underfoot - images in frames in the shape of a foot
   The teacher asks the children to take sheets of paper with a hole cut out in the shape of their own feet and place them in a garden in such a place that as many objects as possible, including living objects (small animals or plants), are placed in it. Then each pupil carries out an "inventory" on a blank A4 sheet, writing down the objects they found in the frame. They also write how many of them fit within the "foot", e.g. dandelion - 2, stone - 1. They can add terms to describe each group of objects, e.g. stone - hard, cold, gray, sharp.

   After the inventory, you can take a picture of a frame with a "natural foot" inside. After printing the photos, you can make a decoration in the classroom or put it on the school website.

   An alternative option is to use a "paper foot" used for colour hunting. After turning it over to the other side, the pupils make a drawing called "Life underfoot", i.e. they reproduce what was in the outline of their feet, in the place where they put the frame.

6. Summary: Life underfoot." - Free text
   After returning to the room, the teacher invites the children on a journey to the land of imagination. The children are asked to sit on the floor in a circle, close their eyes and follow what the teacher is saying without talking or commenting.

   The teacher starts the story:
   Sit comfortably or lie down, close your eyes. Imagine you're not in the classroom, you're in the garden again. It's a warm day, the sun's warming up, a light breeze touches your skin. You hear the buzzing of insects, the hum of leaves. It's nice and you decide to take off your shoes. You keep walking barefoot. And suddenly you put your barefoot foot in an amazing place during the next step. How do you feel? Is there anything warm, soft, sharp or maybe hard, wet or slippery under your foot? You can't wait any longer. Out of curiosity, you rip

your foot off and look? What appears before your eyes? Is it an animal, a plant, a pebble, moss, a lump of earth... Think about how it could have come here? Did it grow out of seeds... or was it carried here by the wind... or did it come by itself... what was it doing... what will happen to it later? Think about it for a moment - what is the story of the life under your feet (keep quiet and give your students a few moments to imagine the "life under your feet").

You're slowly taking your eyes off the spot where your foot was. The garden begins to lose its colour and melts. It's blurry, disappears... . You're in class again. Slowly open your eyes and sit in a circle with us.

- Option 1 - younger children 7-8 years of age
  After opening their eyes, the teacher asks the willing children to tell their stories. If possible, they can record them and place them on the school website or prepare a programme for parents called "Living underfoot".
- Option 2 - older children aged 8-9 years who can already write and form sentences
  The teacher asks the children to take their writing utensils and write the story "Under my feet" starting with the sentence "I have just set foot in the garden ...".
  Once the stories are created, you can publish them as a book for parents or post them on the school website.

Topic: Detectives in the garden. We get to know the parts of plants.

Duration: Three hours.

Age group: classes 1-3 (7-9 years)

Targets:

5. Getting to know the names of plant parts in Polish and English.
6. Getting to know the species of plants growing in the garden.

Materials and aids:

- cards with names of plant parts to be attached to plants (as many cards as students in the class, depending on the size of the group, each name of a plant part is repeated several times, it is worth to printing them out on slightly stiffer cards) - attachment 1;
- cards with pictures depicting plant parts (as many pictures as the pupils in the classroom, the pictures will be repeated) - attachment 2;
- Drawing pads (e.g. the back of a block with a paper clip to attach a sheet of paper);
- drawing cards;
- a pencil for every child and crayons;
- clips, fastening material, e.g. blue tack;
- "Garden detective" badge. (Annex 3).

Important remarks for implementation: Due to the possibility of observation, the ground parts of the plant were selected for naming and fixing in English. At a convenient time, the teacher should mention that the plants also have an underground part, or he or she can enter the English root name.

Course:

1. Preparations
   In the school garden, the teacher places English words marking parts of the plant on the plants in places consistent with the description (attachment 1). Depending on the time of year, some names will not be able to be used, e.g flower (Clips or blue-tacks may be useful for placing cards):

stem	stamina
trunk	trunk
branch	branch
leaf	leaf
blossom	flower
fruit	fruit
bud	kennel

2. Big Search - Task 1
   The teacher invites children to play English detectives. He gives the pupils pictures with parts of plants (attachment 2), each pupil receives one picture and calls it in Polish.
   - The teacher goes out into the garden with the students and presents the task:

Brave detectives, your task is to discover and remember the English names of the plant parts. The whole plant in English is called "plant". The names marking the parts of the plant I hid among the greenery in our garden. I ask each of you to find the name of the part of the plant you have in the picture and write it down next to the picture. This is your first assignment. Don't take your name cards with you. Let them stay where they are. After you've done your homework, come back to me. Remember that you have to move calmly in the garden, because it is the home of many plants and animals, we are guests in it.

- After the task is completed, the pupils return and form groups according to the picture they have received. They can then compare their answers. When the answers differ in the group, the teacher decides and corrects where needed.
- Groups present their pictures one by one, and the teacher gives the name, e.g. "bud". All pupils repeat it loudly. After the presentation, the members of the group give their signed cards to the teacher.
- The teacher randomly shows the cards received from the children and asks for a choral name for the parts of the plant – repeat this several times so that the pupils remember the names.

3. Big search - Task 2
   - On the sign given by the teacher (e.g. a clap or the word "plant") the pupils start looking for the previously hidden cards with the names of the plant parts. This time, every detective has to see and collect as many of them as possible. After returning, each child reads the names from the cards he or she has found. You can also choose the Best Detective - a master of perceptiveness - the child who has found the most pages.
     The fun is worth repeating. We divide the class into two teams. One hides the cards in the garden as described on them (e.g. a leaf next to a leaf). The second team then looks for them in a set time, e.g. for 2 minutes. Then the roles are reversed.
   - After the game is over, the teacher collects all the cards. Then the selected pupil draws one card with the name, reads it, and the rest of the children have to touch the right part of the plant in the garden. We repeat the game several times, so that all the names appear.
4. All parts of the plant - Task 3
   - The teacher emphasizes that detectives, apart from searching for information, must also be able to analyze it and cooperate with each other. So for the next assignment, students draw lots of cards with English names of plant parts (if these are younger children or children who have difficulty learning English names, you can use cards with drawings and signatures made by children). The task of the detectives is to form groups in such a way that it is possible to create a complete plant from the parts of the plant they possess, e.g. leaf, stem, flower. After completing the task, the groups check one another to see if they're correct.
   - Each group selects one plant in the garden and arranges their sheets of paper at the appropriate parts of the plant. After the cards have been laid by all groups, the whole class goes from one marked plant to the next. For each of them, the group that placed their card there shows and names the parts of the plant.
5. "Portrait" of my plant

   A good detective can carefully observe objects and then present them as faithfully as possible. So the teacher asks the children to go through the garden again, take a close look at the plants, choose the one they are interested in and draw an exact "portrait" of it. After choosing the

object, the pupils receive from the teacher a pad and a card, each child sits next to the selected plant, draws it and labels the different parts.

6. Description of the plant
   After returning to the classroom, the pupils search for the name of their plant in the plant atlases or on the Internet. They can use applications that allow them to recognize a plant by its photo, such as *PictureThis - Plant Identifier*. On the basis of the drawing, they make a simple oral description of it in English, using the known names for parts of the plant. This activity is intended for students in grades II and III. Children can also make a written description of the plant by attaching it to the drawing.
7. Summary of classes
   The teacher evaluates the students' work and gives them the badge "Garden detective" to put into the notebook. (Annex 3).

Additional activities (proposals):

1. Plants in our garden - a school exhibition of student works.
2. Guess what this is - a presentation of plants from the school garden prepared for parents or colleagues from another class.
   - On the board we place pictures made by students and using these the invited guests try to give the names of the plants growing in the school garden.
   - Selected pupils, without revealing their drawings on the board, describe their plant in simple English, e.g. the colour of its flowers, size, leaf shape. The guests try to indicate it on the board on the basis of the description.
   - Guests are invited to the school garden and each given a prepared drawing. The task of the guest is to find the plant, whose drawing they hold in their hand.
3. Plant lottery
   Put a sheets of paper on the floor with the names of different parts of the plants, so that the name is covered. Groups pick up cards one by one and can take them if they no longer have a name in their set. The winner is the team who is the first to complete all parts of the plant.

4. What is missing?
   The teacher hangs the names of parts of plants on the board in such a way that they form a complete plant. The pupils close their eyes and take one name. The students then need to tell the teacher what is missing.

Annex 1

stem	stem	stem	stem
trunk	trunk	trunk	trunk
branch	branch	branch	branch
leaf	leaf	leaf	leaf
flower	flower	flower	flower
fruit	fruit	fruit	fruit
seed	seed	seed	seed

Annex 2

.....		.....	
.....		.....	
.....		.....	
.....			

Annex 3

Garden Detective!  That's you!	Garden Detective!  That's you!	Garden Detective!  That's you!
Garden Detective!  That's you!	Garden Detective!  That's you!	Garden Detective!  That's you!
Garden Detective!  That's you!	Garden Detective!  That's you!	Garden Detective!  That's you!
Garden Detective!  That's you!	Garden Detective!  That's you!	Garden Detective!  That's you!

Topic: Little gardeners!

Duration: 4-5 hours (the time depends on the class)

Age group: classes 1-4 (7-9 years)

Targets:

1. Introduction of English vocabulary related to gardening.
2. Developing skills in gardening using simple tools such as raking, digging, preparing the ground for sowing and planting, and watering.
3. Getting to know the names of gardening tools.

Materials and aids:

- garden tools and accessories: watering can, garden hose, shovel, claws, spade, hoes, garden forks, rakes, wheelbarrows, seeds, seedlings, gloves (at least as many pairs as will be needed to work in the garden);
- A5 size sheets with letters forming the words 'Gardening' - each letter printed/written on a separate sheet;
- A5 size sheets bearing the names of garden activities, related objects or plants (one sheet bearing one inscription at the bottom of the page so as to leave room for illustration). There are as many subtitles as there are children in the classroom;
- drawing pads (e.g. rigid A4 cardboard with a linen clip);
- materials for making a "Gardening" poster - a large sheet of paper - A1 size cardboard (as many sheets as groups making a poster), colour magazines, advertising newspapers, colour paper, glues, scissors, markers, pencils, pens, etc.

Important remarks for implementation: It is best to conduct classes in early spring, when garden work of various kinds is the most important.

Course:

1. Introduction - What does the word "gardening" mean?
   The teacher invites the class to the garden, spreads the letters GARDENING on the grass. The task of the group is to make a whole word out of it. If necessary, give advice, e.g. by telling children which letter should be the first, the last, and the middle letter.

   When the inscription is unveiled, the teacher asks the children what the word means. The children in pairs think about the answer and write it down.

2. A play on words - the introduction of English names for gardening
   The teacher should inform the students that they have prepared a game of puns to help them to guess the meaning of the word "gardening" or to confirm that the pupils' idea of the meaning of the word was correct. The teacher should tell a group of selected children the gardening activity in question and these students must then describe this activity to the rest of the class who must then guess what the activity is. In addition, you can add

names of objects or plants associated with gardening to the game, which will enrich children's vocabulary and help them to guess the meaning of the word "gardening".

The teacher asks the students to present the following activities and things:

- rake
- dig
- watering
- sow (to plant seeds)
- plant
- weeding (removing weeds)
- seeds
- grass
- tree
- plant pot
- flowers
- soil

After the class has correctly guessed the activity, the teacher repeats the word and writes it in English in a visible place.

3. Work in the garden - consolidation of the names of activities related to the cultivation of the garden
   - After the game of puns is completed and the names of the gardening-related activities and objects have been written down and repeated by the class, the teacher should ask the students to verify their ideas regarding the meaning of the word "gardening". Confirm that the word means growing a garden. Give the children cards with the names of garden activities and ask them to draw that activity on the card. Each child should have one card with the name of an activity and one card with the name of a gardening-related thing. After completing the task, the teacher can collect the drawings, place them in a stack and, discovering them one by one, read out the name and the children can use gesture to represent the meaning of the word.
   - The teacher arranges one illustration of each activity or thing on the grass. They can ask the children to close their eyes, then take one sheet of paper and asks the question: "What is missing? ". It's the children's job to tell what's missing. The game should be repeated several times. You can also make various modifications - take more than one card, change the location of cards (then ask the question "What has changed?").

Note: If the childrens understanding of English is insufficient, we use the dual system, i.e. we first ask the question "What is missing?" and then provide its translation.

Additionally, If the group you are working with has a tendency to get distracted and has difficulty concentrating or paying attention, it is worth considering doing this part of the activity in class. Below is a proposal for an introduction to the subject in class:

- The teacher hangs on the board a sheet of paper with letters forming the word GARDENING. The cards are hung in such a way that the letters face towards the board and thus the sign cannot be seen. The teacher can then invite the students to guess what the inscriptions are under the cards. The teacher can also propose a competition – the teacher versus the class. If the children guess/unveil the entire subtitle in no

more than 12 attempts, they will win, if they do not succeed, the teacher will win. The teacher draws 12 circles on the board (number of attempts). Students give letters. If the letter is in the inscription on the blackboard, the teacher reveals it. The teacher erases one circle from the whiteboard each time the students enter a letter. Students will win the competition if they guess the inscription before the teacher wipe away all circles.

4. What does our garden need? - little gardeners for a start.
   The teacher gives the students time to take a free walk and determine if this activity, which the student illustrated on a piece of paper, should or could be done in our garden. The pupils walk individually or in groups, bringing together all the people with illustrations of the same gardening activity.
   After viewing the garden, the children share their ideas, justifying their opinion on the direction of the garden. Walking from place to place, they decide together with the teacher which work to do and which plants they would like to sow or plant.

5. Horticultural tools
   The teacher collects in one place:
   - Watering can (garden hose)
   - Shovel
   - Garden rake
   - Hoe
   - Seedlings
   - Gardening fork
   - Seeds
   - Spade
   - Gloves
   - Wheelbarrows
   -

   The teacher can then ask the children to stand in a circle and put their paper on the object they think is needed to do their job. The teacher (you can also invite a parent, grandparent or friend of a gardener) verifies the children's decisions and show them how to use the different tools. Particular attention should be paid to the fact that gardening work should be carried out with gloves because of the contact with the ground and the possibility of injury. Most likely, children will quickly notice that more tools are needed for some activities.

6. Garden work - the test of a small gardener
   Note: To help with this part of the activities, it is advisable to invite older colleagues, grandparents, parents, etc. who will act as tutors, and to take into account the garden work that the children have chosen during the garden celebration.

   The teacher draws the students' attention to the fact that gardening requires all of the work to be done properly. They should then divide the class into several teams. Each team should receive a caretaker/tutor, with whom they perform the following work in the designated area of the garden:
   - digging beds
   - planting or sowing

- watering
- weeding
- raking (garden cleaning)

Before each activity, the mentor explains and presents the activity, supervises the children's work, ensuring that all small gardeners have a chance to get involved.

If it is not possible to invite tutors, the teacher should choose one of the garden activities (e.g. raking) and show the children how to do it. As far as possible, children should rotate change so that everyone can try it. After one activity, the teacher should select the next one, e.g. sowing selected plants.
Note: After this work has been done, you should decide how the garden will be maintained (e.g. on duty of small gardeners, families, handing over the garden to older colleagues, e.g. from a nature club).

7. The "Gardening" poster.
   In groups, the students prepare a poster - a collage entitled "Gardening". Their task is to place as many gardening items as possible on it. They can use advertising newspapers, magazines and drawings to enrich their work and use the cards with illustrations of gardening activities.

Additional activities (proposals):

1. Excursion to neighboring gardens - a view of the plants and an interview with the owner.
2. A visit to a gardening store - an interview with a gardener. Viewing gardening tools, seedlings, seeds. The purchase of seeds and seedlings for the garden.
3. Introducing the English names of garden tools and accessories needed to work in the garden, e.g.: watering can, shovel, rake, hoe, garden trowel, garden fork, garden gloves, wheelbarrow. Free clips for this topic can be found on the website: https://www.mycutegraphics.com/graphics/garden-images.html

Topic: A Garden in the four seasons of the year

Duration: annual project of at least 20 - 30 hours of classes

Age group: classes 2-5 (8-11 years)

Targets:

1. To improve students ability to observe and explore nature using different senses.
2. Implementation of systematic observation.
3. Developing the ability to document observations and take notes.
4. Recognising changes in nature due to changes in the seasons.

Materials and aids:

- Photographs depicting a similar or the same place (e.g. a street, a park, a forest) in four seasons of the year; younger children may be offered the chance to colour a drawing depicting a landscape in different seasons of the year;
- Lapbook/lab book materials (binder covers, colourful cards, templates for pockets, glues, scissors, crayons, markers);
- Pages useful for preparing a lapbook/lab book:
  https://appletasticlearning.com/2015/03/17/how-to-make-lap-book/
  https://kreatywnapedagogika.wordpress.com/2017/02/28/lapbook-dla-kazdego/
  https://www.teacherspayteachers.com/Product/Interactive-Notebook-Templates-FREE-Sampler-Pack-9-Templates-1236067
- materials and tools useful in documenting changes in the garden:
  - drawing or writing pads (e.g. the back of a block with a paper clip to attach a sheet of paper),
  - writing and drawing instruments,
  - white sheets of photocopying paper in A4 format,
  - Magnifiers,
  - a camera to take pictures,
  - a phone with a plant recognition application, e.g. "Plant Atlas", "Whose leaf is it", "PlantSnap", etc.
  - Insect observation traps,
- a situational plan of the garden prepared by the pupils.

Important remarks for implementation: The best time to start the project is September, because then the project has a chance to close in one school year. The scenario proposes cyclical observations of nature on selected areas of the garden in subsequent seasons of the year, carried out according to the same scheme. In addition, for each of the seasons, one additional activity is proposed, which uses a unique moment of the annual cycle in nature. In early spring, it will be the recognition of trees by their buds, in summer, we will focus on colours and smells, in autumn on leaves, and in winter on animal trails in the garden. A separate set of objectives, materials and assistance is planned for each of these proposals.

Course:

1. Introduction

– The teacher hangs on the board illustrations showing the same or a similar landscape in four seasons of the year (younger pupils can colour the colouring book and have it on the countertop in front of them). Then the pupils, individually or in groups, look for differences and similarities between the illustrations.
  After summing up the observations, the teacher asks students to consider how the school garden changes as the seasons change.
  The teacher divides the class into teams, each team writes on a piece of paper their ideas on how our garden or school environment changes in the following seasons of the year. After taking notes, each team writes down the date and composition of the team on a piece of paper. It is very important that the teacher collects and saves the cards. They will be needed at the end of the project.
– The teacher proposes the year-round project "Garden in four seasons of the year" to the students, and elaborates on how they will conduct it.
  The project consists of systematic observation of the garden in accordance with the guidelines prepared by the teacher. Each pupil will observe a selected part of the garden (no larger than a square with a side equal to the height of the child).
  The pupils will place their observations in a lapbook/lab book entitled "Garden in the Four Seasons".

2. Going out to the garden - identification of places (symbolic "squares") to be observed

– The teacher and the pupils prepare a garden plan for the situation. Younger children together with their teacher prepare a drawing - a garden outline with marked characteristic points, such as shrubs, trees, beds or elements of inanimate nature. Older students can prepare a precisely dimensioned timetable with the marked location of characteristic points during the math lesson.
– The pupils and the teacher choose their squares in the garden to observe (as many places as the pupils). They mark them on the prepared plan, entering the child's name in this place. You can also take a picture of the child in a square assigned to them.
  Note: If you have a large group or a small garden, you can assign two children to each square.

3. Lapbook/lab book
  We ask students to prepare a lapbook/lab book. If children have never used this method of collecting information, it is worth showing them examples of lapbooks/lab books. Then each child can prepare the lapbook/lab book, which will contain the first information about their observed square (the scope and amount of this information depends on the student).

4. Discussion of observation tasks
  The teacher informs the children that the garden will be observed at least 4 times - once every season. However, if students would like to go out and gather information about their square more often, it is worth allowing encouraging them to.

Every student should receive a "Garden observation card", which contains a set of commands to be executed in a selected area of the garden.

The teacher can present the card (attachment no. 1), discusses the tasks and the instruments used to perform the tasks depicted on the card.

Tip: The instruments should be demonstrated in the classroom and then again in the school garden.

5. Observations in four seasons of the year

   The teacher, in accordance with the schedule that they have prepared and agreed with the students, will organise research and observation activities in the garden throughout the school year. On each occassion, the students can work on the lapbooks/lab books once they return to the classroom after the activity.

   After each visit it is good to summarize it in a circle, asking students to show their latest entries, share what surprised them, interested them, cheered them up, saddened them, and what they had learned about their place in the garden.

6. Secrets of the four seasons

   The surrounding nature changes with the rhythm of the seasons. It is worth taking advantage of this by conducting four additional lessons during the year-round project, closely related to each of them.

   In this way, the pupils will notice that each season of the year offers different opportunities for interesting nature observations.

   At the end of the screenplay, a set of four lessons was proposed to be carried out, one at each time of the year.

7. Project Summary

   After completing the cycle of four seasons of the year in the garden, the students can present their lapbooks according to the key adopted by the teacher.

   Then the teacher gives out the children's ideas about how the garden will change in the four seasons of the year, prepared by them at the beginning of the project – Students can then confront their previous assumptions/hypotheses with the knowledge that they have gained during the project – on the second page they write down what they learned during its implementation.

Proposals for additional actions:

1. Recording of a film with children's commentary "Four seasons in the school garden".
2. Preparation of a lapbook/lab book exhibition and showing colleagues and students from other classes around the exhibition.
3. An invitation to parents for tea in the garden, during which each of the children will tell an interesting story about the place they are observing.

Annex 1

"Garden in the Four Seasons" - Observation card

Date of observation: ……	**Observer's name: ……**
Description of the site and drawing or photograph	**Elements of inanimate nature**
	Number and type of elements: Description of one of them:
Weather	**Soil**
Air temperature: Clouds: Precipitation:	Colour: Looks like it: Consistency:
Plants	**Animals**
Number and name of plants observed: The appearance of two selected plants:	Number and name of animals observed: The appearance and behaviour of the selected animal:

A set of four scenarios to be carried out at different times of the year

Topic 1: Autumn colours

Completion date: September - October

Duration: 1 h

Age group: classes 2-5 (8-11 years)

Targets:

1. Getting to know the dyes hidden in autumn leaves.
2. To develop student's skills in conducting natural research and formulating conclusions.

Materials and aids:

- leaves collected in a garden/orchard/park;
- mortars with the pestle;
- test tubes or small jars;
- acetone;
- pipettes.

Course:

1. The teacher goes out with the students to the garden, orchard or park. The lesson starts with a reminder or an introduction (if the subject has not been approached yet) of what photosynthesis is.
   The teacher explains that plants produce the green colour chlorophyll, which is necessary for photosynthesis, which enables plants to produce their own food using water and light. When winter comes, chlorophyll gradually disappears in the leaves, giving way to other dyes. In this way, among other things, the tree is prepared to stop the photosynthetic process. The trees then drop their leaves and finally go to rest in the winter.

   Which dyes are found in autumn leaves?

   - Carotenoids – These dyes are what make carrots orange! They also make leaves yellow, orange or brown. When chlorophyll gradually disappears in autumn, these dyes, which were not previously visible because of the chlorophyll, become visible and the leaves change colour!
   - Anthocyanins - These are produced only in autumn and protect the plant from freezing, so that the leaves producing these dyes no longer fall from the tree.
   - Chlorophyll – This is produced all year round by needles, i.e. the leaves of coniferous trees (except larch, which drops needles in winter), because these trees are photosynthetic all year round.

2. Students can collect the most beautiful specimens of leaves in different colors: red, yellow, orange and green (from coniferous trees and shrubs), preferably several specimens of each species.

3. When returning to the classroom, wash the leaves thoroughly so that dirt does not contaminate the extracted dyes; fragments of discoloured or damaged leaves may also be removed.
4. Extraction of dyes:
   The course of the extraction:
   1) Slice the leaves into small pieces in sufficient quantity to fill half a mortar.
   2) Pour in 10 ml of acetone (or more if you have a large mortar).
   3) Grind the leaves in a mortar for about 3 minutes (if the dyes do not release or you have added too many leaves, you can add more acetone and grind longer).
   4) When the acetone has a strong colour, pipette the extracted colour into a tube or jar and pour into a tube or jar.
   5) Repeat this step with the leaves of each colour.
   6) We place jars of dye on the leaves of trees of the same species as those from which the pupils extracted the dye and compare them with the colour of the leaf.

Spreading pieces of leaf mixed with acetone in a mortar, fot. Katarzyna Komisarz

Collecting extracted dye with a pipette, fot. Katarzyna Commissioner

Extracted dyes. From the left: chlorophyll from spruce needles, apple leaf carotenoids, lime leaf carotenoids, anthocyanins from grapevine leaves, photo: Katarzyna Komisarz.

5. At the end of the class, tightly closed jars of dye can be placed in the autumn corner as an exposition. In order to improve the visual effect, we place the leaves of the same species as those from which the dye was extracted under or next to the jars and attach a plate with the name of the plant species and the name of the dye.

Topic 2: Looking for clues of our neighbors in our garden

Delivery time: December - February, depending on the presence of fresh snow cover

Duration: 1 h

Age group: 2-5 (8-11 years)

Targets:

1. To become familiar with the method for distinguishing between animal species by their traces.
2. Development of natural observation skills.

Materials and aids:

- a chart with animal tracks (Annex 1) or selected literature, e.g:
  - *"Animal footprints and tracks."* - G. Ohnesorge, B. Scheiba, K. Uhlenhaut
  - *"Animal footprints."* - K. Richarz, A. Limbrunner
- cameras;
- coins, rulers, pencils or other objects that allow you to assess the size of the tracks.

Course:

1. The teacher divides the students into several groups. Each group observes a different area. It is best to observe after a fresh snowfall when the animal tracks are most visible. One should move carefully so as not to overlook or trample the clues. Students watch out for animal tracks in the snow. They then try to mark the clues that they have found by comparing them with available illustrations on the Internet (Annex 1) or in atlases.
   Remember that recognizing animal tracks is not easy and can be difficult for students. Let us show them, however, that you can read the traces left by animals and thus find out which species live next to you. The exercise develops students ability to see different elements of nature.

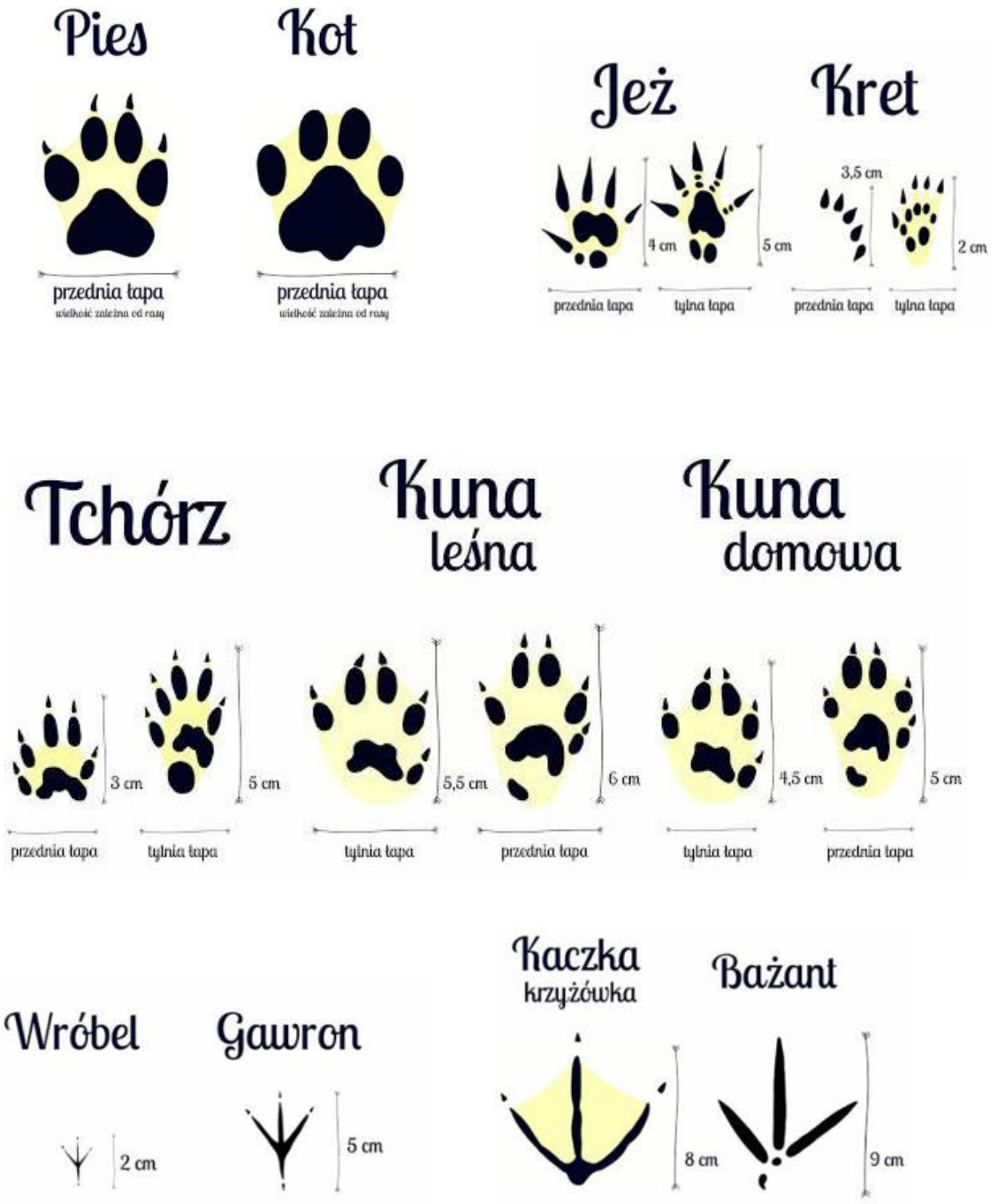
2. The clues found can be photographed. To correctly assess the size of the track in a photograph, place a known-sized item next to the track, e.g. a coin, pencil, ruler or hand, as shown in the picture below.

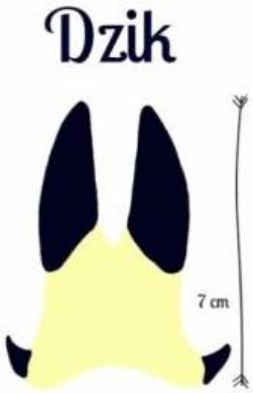
How to best assess the size of the animal trail. (Source: www. bezogrodek.com)

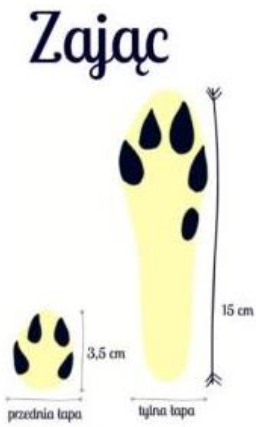
3. After returning to the classroom, the pupils compile photographs taken during the class on a computer and create a multimedia presentation or poster using photographs, which they can then hang in the classroom or in the school hallway.

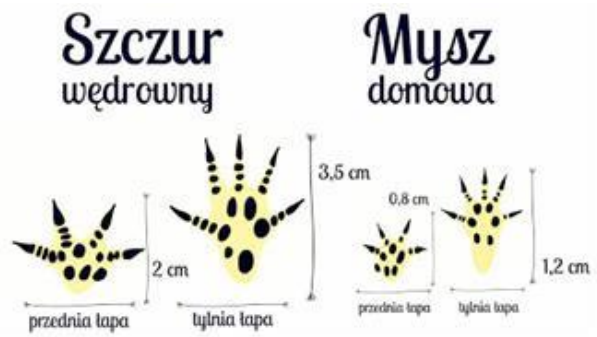
Annex 1: Traces of selected animals that visit the gardens.

NOTE: How do I read the clues in the drawings? Black spots are claw prints and fingertips, and yellow spots are the rest of the prints left by the fur or membranes between the fingers.




Dzik
7 cm


Zając
15 cm
3,5 cm
przednia łapa
tylna łapa


Szczur
wędrowny
Mysz
domowa
3,5 cm
2 cm
0,8 cm
1,2 cm
przednia łapa
tylna łapa
przednia łapa
tylna łapa


Wiewiórka
ruda
3 cm
4 cm
tylna łapa
przednia łapa


Pies
przednia łapa
wielkość zależna od rasy
Lis
5 cm
6 cm
przednia łapa
tylna łapa

Source: A list of tracks was prepared on the basis of data from the website bezogródek.com edited by Łukasz Skopa.

Theme 3: Spring in the garden, or how to recognize a tree without leaves?

Completion date: end of February to beginning of April

Duration: 1 h

Age group: classes 2-5 (8-11 years)

Targets:

1. Developing the ability to recognize trees by their buds and bark.
2. Development of natural observation skills.

Materials and aids:

- atlases of trees and shrubs - recommendations:
  - ″Shoots and buds" - Jean-Denis Godet (the book is also available in English)
  - ″A guide to recognizing trees and shrubs." - Jean-Denis Godet
  - "Winter shoot atlas" - Jacek Adamczyk
  - "Recognition of ornamental trees and shrubs in leafless condition″ - Tadeusz Szymanowski
  - "Dendrology" by Jakub Dolatowski, Vladimir Seneta...
- charts showing tree bark of selected tree and shrub species (Annex 1)
- cards and pens;
- stickers - empty labels;
- Magnifiers.

Course:

- The teacher goes with the students to a garden, a nearby forest, orchard or park and divides the class into 4-5-person groups.
- The pupils look at the surroundings for a moment. The teacher asks questions for joint discussion: Do the pupils recognise the species of trees or shrubs that grow here? What is the easiest way to recognize a tree species? When is the easiest way to do it -

summer, autumn or winter? The teacher then explains that in winter and early spring, when trees and shrubs have no leaves, they can be identified by their buds, which are covered with rigid protective scales. Trees can also be recognized by their bark (Annex 1).

- Students should carefully observe buds on trees; they can also use a magnifying glass to observe them. They can compare them with the illustrations and descriptions in atlases and guides (see section Materials and aids), as well as with the resources available on the Internet (e.g. charts with illustrations at woodlandtrust.org.uk/naturedetectives). With the help of available materials, they should try to identify the species correctly. Then, under the tree, which they recognized, they can put a card with its species name. The teacher checks if the students have completed the task correctly or helps to correct errors.
- At the end of the class, the pupils tear off individual small twigs with buds from the tree
  and stick the cards (labels) to them, and then create a small exhibition in the classroom, or stick the labels directly on the branches.

Collected twigs with buds and described labels (source: http://www.herbiness.com)

Annex 1: Bark of selected deciduous and coniferous trees

	**SILVER BIRCH** *(Betula pendula)* She's white, which she owes to the betulin dye, and thin. There is flaking bark around the trunk perimeter. Fragments of blacker, thicker bark are characteristic. In older trees, the lower part of the trunk thickens, cracks and darkens.
	**EUROPEAN BEECH** *(Fagus silvatica)* The cortex is thin, smooth and light grey. It doesn't flake. In older trees, the grey ash may be slightly cracked at the bottom.
	**ASH** *(Fraxinus excelsior)* In young trees it is greenish grey, smooth and thin. Covered with a soot-like texture. With time, it darkens and breaks. Shallow longitudinal furrows form a dense mesh pattern.
	**OAK** *(Quercus robur)* In older trees it is thick, cracked and rough. The furrows are cracked and rough. They have a triangular cross-section, they are deep.
	**EUROPEAN HORNBEAM** *(Carpinus betulus)* It's light grey in the young trees. The old ones get darker and slightly cracked. The most characteristic feature is the longitudinal, lighter streaks running along the trunk.

	**BLACK ALDER** *(Alnus glutinosa)* Black and grey and smooth. In older trees, the bark breaks, covers itself with scales and becomes almost black.
	**ASPEN** *(Populus tremula)* In the lower part of the trunk of older trees, the bark is darker and longitudinally cracked in long furrows.
	**SYCAMORE** *(Acer pseudoplatanus)* It's gray-brown in young trees. In older trees, it is peeled off with thin, large patches, which makes the trunk a characteristic patch of light grey.
	**LIME** *(Tilia cordata)* Brown-grey. It cracks lengthwise into characteristic slats. The furrows are thick and shallow.
	**SCOTS PINE** *(Pinus sylvestris)* The lower part of the trunk is thick - it can be over 10 cm thick! The characteristic, tile-like way is cracking. It's brown-grey on the outside, dark cherry on the inside. In the middle and upper part of the trunk it is reddish yellow, thin and peels off with thin flakes.
	**NORWAY SPRUCE** *(Picea abies)* Very variable - it can be long and cracked, have round or slightly elongated scales. Grey-brown to red-brown. Its surface peels off with circular, protruding plates.

	**SILVER FIR** *(Albies alba)* In her youth she is smooth and whiteish. In older trees it cracks irregularly and rectangular tiles appear. The characteristic feature are bubbles with resin present in the bark.

Source: State Forests, www.lasy.gov.pl

Topic 4: Fragrances summer

Completion date: end of May - beginning of September

Duration: 1 h

Age group: class 2-5 (8-11 years)

Targets:

1. Development of natural observation skills.
2. To sensitize the different senses that allow you to get to know the world of nature.

Neededed materials:

- cups;
- jute or linen bags
- wrapping or other paper for drying plant elements.

Comments on implementation: Classes can be conducted from the moment flowers begin to bloom until early autumn.

Course:

- Students go out to the garden/orchard/park and collect all the elements of nature that give off smells, e.g. pieces of bark, rose petals, dry sticks, grass, cones and others. The teacher can also designate a garden area where students can harvest garden flowers or fruit, e.g. a wild rose.
- Each pupil chooses one of the collected elements and puts it in a cup. The pupils then pair up without showing each other what they have in their cups. One of the pupils with their eyes blindfolded tries to guess from the smell what is in their friend's cup, and then the roles are changed.
- The pupils put each of the found elements into a cup one by one and check how the fragrance of the composition changes (they can exchange, add or subtract selected elements) so as to create a fragrance that they like.
- Once everyone has created their own mix, the pupils stand in a circle and pass their cups clockwise to compare their cups with the scented compositions created by their colleagues. The activity is repeated until each mix is returned to its owner.

Observation, sniffing and selection of elements for fragrance composition, photo: Katarzyna Komisarz

– After returning to the classroom, each student spills their mixture on paper. The elements should be dried in a dry and sunny place for at least a week. If there are many leaves in the composition, they can be wrapped in a newspaper and pressed with a book (then drying may take longer). After this time, pour the dry mixtures into the bags. Scented bags can be a gift for moms and grandmothers.

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