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Activity Handbook

Module 6
CITY FOR ALL SENSES

TUDEC – Through Upcycling to the Design of Eco Cities

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INDEX

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6.1 My school garden

1. Type of activity

Outdoor activity

2. Topic

Delicious food: Growing food in the city

3. Learning Objectives

- Expanding learners' knowledge about the processes of selecting, recycling and reusing of materials
- Developing awareness of the sustainable way of life
- Developing awareness of the importance of environmental protection and the use of recycled materials for making useful objects.
- Encouraging creativity and thinking about ways to make pots from recycled materials.
- Stimulating interest in gardening and plant maintenance.
- Understanding the importance of growing healthy food without the use of pesticides.
- Expanding knowledge about various types of fruits and vegetables.
- Understanding the connection between agriculture, food and the environment.
- Providing opportunities for practical learning and developing different skills, such as woodworking and gardening skills.
- Encouraging creativity and teamwork

4. Target group

- Learners aged 11-14 (making pots from pallets)
- Learners aged 6-14 (making pots from wooden crates)

5. Necessary materials

- Pallets
- Hand tools (saw, hammer, screws)
- Black gardening foil or large black garbage bags (of your choice)
- Stapler
- Garden soil
- Seeds or small plants
- Paint, brushes and decorative materials for decoration (optional)
- Notebook, pencil, markers
- Working Gloves
- Gardening tools
- Wooden crates (for lower classes learners)

6. Duration

Several days due to the complexity of the activities

7. Main activities

Activity 1

Through brainstorming activities encourage learners to name as many fruits, vegetables, and herbs they know. Then have them describe their favourite fruit, vegetable or herb. Discuss the benefits of eating fresh healthy food every day.

Ask the learners to think about making it possible to have fruit and vegetable seedlings in our community.

Take them to a nearby green market where the learners would see different types of vegetables and fruits. Have them ask the vendors questions about growing this healthy food.

After the visit, let them describe and illustrate in their notebooks which new types of vegetables and fruits they saw at the green market.

Activity 2

Lead a discussion with the learners about the visit to the green market. Explain that the next activity will be to create a vegetable and fruit garden in the schoolyard.

Start a conversation with the learners about the importance of recycling materials. Explain to them how pallets, which are often thrown away, can be repurposed into useful items such as gardening pots. Show learners videos or photos of how pallets can be taken apart to make wooden slats that can be used to make gardening pots/planters. Tell them that together you will make just such pots/planters for your school garden. After explaining the activity, take them to the school yard and choose a place for your activity.

Divide the learners into small groups or pairs, depending on the number of pallets available. Provide each group with the necessary tools and materials. Supervise and assist the learners as they cut, assemble and sand the pallets to create their pots.

After the crafting is done, help them line the pots with gardening foil or large black garbage bags. The garden foil is stapled to the wooden slats with a stapler.

Encourage learners' creativity by allowing them to decorate the pots as desired. After making the pots, leave them in the yard to dry well.

Activity 3

Once the pots are ready show the learners how to fill them with potting soil and how to plant the seeds or the small plants. Explain proper care and watering techniques.

8. Final activities – drawing a conclusion

- After planting, encourage the learners to observe the plants as they grow and record their changes.
- Help them make a care plan for their new plants.

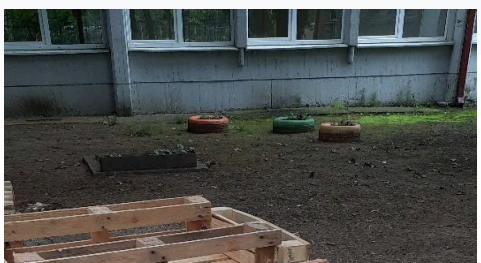
- Discuss the different stages of plant growth and the factors that contribute to healthy plants.
- Discuss the light, water and food needs of plants and how you can provide those conditions.
- When all the pots are finished and planted, organize a small exhibition where the learners will present their "School Garden" project to the learners in the school and encourage them to get involved in the project.
- You can also present the project to parents and the community to encourage them to get involved.
- Talk to the learners about the end result of the project as well. Encourage them to distinguish between the taste of fruit, vegetables and herbs they buy in the market and those they have grown in their own garden.

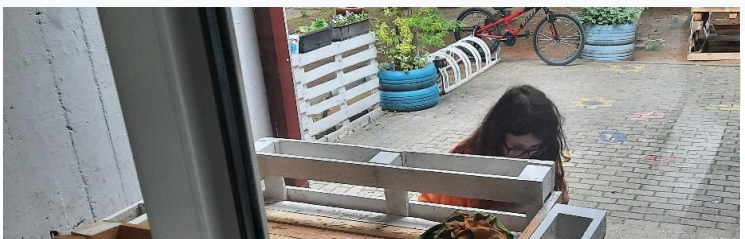
9. Reflection, review of the objectives

- Discuss with learners whether they have achieved the objectives of the activity.
- Give them the opportunity to share their experiences and what they learned from the activity.
- How did you like the activities?
- Which activity was most interesting to you?
- How did you feel while doing the activities?
- Were your vegetables and fruits tasty?
- Why is there a difference in the taste of the fruits from your garden and those fruits that you buy in the markets?
- Do you understand the harmfulness of pesticides?
- How would you encourage others to make their own home gardens?
- Why is it important to grow domestic vegetables and fruits in cities?
- Will farming improve air quality?

10. Inspiration

- While growing the plants in your "School Garden" you can present the learners some interesting ideas for decorating the planters
- You can come up with a few different ways of arranging the pots, such as building small vertical gardens.





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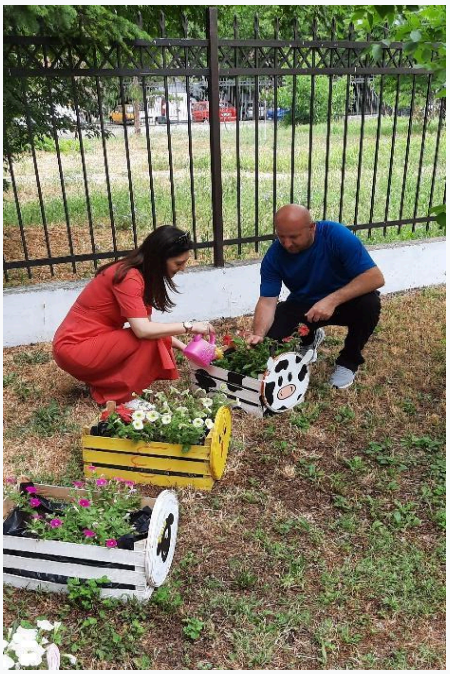
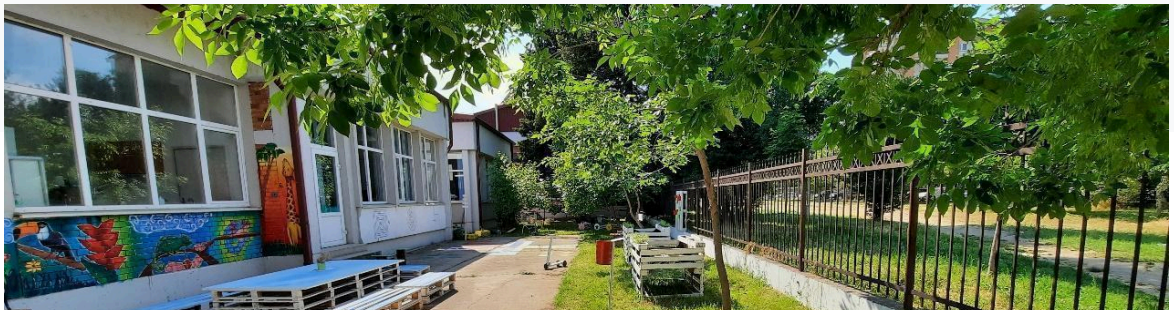
OPTIMUM





Source, private photos Slavica Nestorovska Damjanska

11.Explanation for children with disabilities: You will find an addition in the next activity 6.2

6.2 My school garden for children with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.

Encourage him to give his opinion about the activity. Then, together with other children, put him in a group with classmates for mutual socialization and interaction. The child can plant seeds and finally water them. Also, during the observation, encourage him to draw a picture of the growing of the seeds and with the help of questions let him answer for the differences he perceives.

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6.3 Rainwater collecting bin

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Delicious food: Growing food in the city

3. Learning objectives

- Learning about alternative ways of supplying irrigation water and how to save clean drinking water
- Improving learners' knowledge about water circulation – the water cycle as part of the natural ecosystem
- Introducing the concept of rainwater and the process of collecting rainwater
- Learning how rainwater can be used in everyday activities and how it affects the environment.
- Developing awareness for the protection of water resources and their sustainability.
- Stimulating the learners' creativity and practical skills through the creation of a rainwater collecting bin.
- Encouraging teamwork and collaboration between the learners.

4. Target group

6 – 14 year-old learners

5. Materials needed

- A bin with a lid, or a barrel with a lid (of your choice)
- Writing utensils (notebook, pencil, pen, eraser, etc.)
- Acrylic paint (of your choice)
- Brushes (of your choice)
- Garden hose
- A faucet
- A tool for making holes (an awl or a sharp knife)
- Waterproof glue

6. Duration of the activity

1-2 hours for the creation of the bin and additional time for the collection of rainwater in the bin (the best season for the activity is spring or autumn).

7. Main activites

Start a discussion with the learners about the processes of the water cycle and how rainwater has an important role in them. In this part of the activity the learners will make containers of their own for collecting rainwater.
Before starting the activity, it is best to get an old large bin or several smaller litter bins with lids. First, the learners will be divided into teams and will be given the task of making a bucket for collecting rainwater by themselves. For this purpose, it will be explained to them how the rainwater collection bin works. Each team will receive the necessary material for making the bin and will start working.
Several openings are carefully made on the lids with a pointed object so that the water can enter (for younger learners this is done by the educator). Optionally, instead of a lid you can put a fine mesh over the opening of the bin. If the bins are larger, the educator carefully makes an opening in the lower part of the bin so that a faucet can be placed, which is then connected to a garden hose. Waterproof glue is applied around the faucet so that the accumulated rainwater does not leak. The learners decorate the bin of their choice and use their creativity and skills to create a bin that is practical and functional. The bin is located at a certain place so that dries well.
Finally, the rainwater collection bins can be placed in the school garden or other convenient places where rainwater is collected and then used for various purposes.

8. Final activities – drawing a conclusion

After the work is done, the teams will present the bins and describe their design and construction. The learners will explain the processes involved in making their bins and how they can be used to collect rainwater.
After completing this activity, the learners will be engaged in collecting rainwater in the bins. While it is being done, the educator and the learners can discuss the importance of this process and how that water can be used for different purposes. Finally, the learners can make observations and analysis of the collected water, as well as draw conclusions about the significance of collecting rainwater.
They can present their findings and conclusions about the collecting rainwater process and its importance for the environment and human activities.
The collected rainwater can be used to water the flowers and plants of the school garden.

9. Reflection – overview of the goals

- What did we do today?
- Why is rainwater collected?
- How important is it to preserve water?
- How did you feel while doing the activity?
- Do you think something needs to be changed and how could the activity be improved?
- What was the biggest problem for you while doing the activity?
- Did you all work together as a team?
- Would you share your knowledge and ideas with other learners?
- Did this activity (and how much if yes) encourage you to think about the importance of environmental protection and the application of sustainable practices?

10. Inspiration

- While the rainwater is being collected, the educator and the learners can discuss the importance of water and the ways to protect water resources.
- Explore with the learners the possible ways of using the collected rainwater in everyday activities to expand the discussion and encourage the learners' creativity. https://cudnasuma.com/2020/06/03/%D0%B2%D0%BE%D0%B4%D0%B5%D0%BD-%D1%86%D0%B8%D0%BA%D0%BB%D1%83%D1%81-%D0%BA%D1%80%D1%83%D0%B6%D0%B5%D1%9A%D0%B5-%D0%BD%D0%B0-%D0%B2%D0%BE%D0%B4%D0%B0%D1%82%D0%B0/

Source, private photos Slavica Nestorovska Damjanska

11.Explanation for children with disabilities: You will find an addition in the next activity 6.4

6.4 Rainwater collecting bin for children with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.
With the help of questions, encourage the child to give an explanation about the importance of water on all living organisms and how we can save it from unnecessary usage. Together with the other children, include him in the part of the activity where he can decorate the rainwater bucket. When the bucket is filled with rain, encourage the child himself to water the flowers and plants in the schoolyard with the water.

6.5 Recycled paper packages with seeds

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Delicious food: Growing food in the city

3. Learning objectives

- Developing habits of selecting, recycling and reusing
- Raising awareness of sustainability and reduction of environmental waste
- Getting to know the sustainable use of resources and the importance of nature protection
- Gaining knowledge about the process of planting and taking care of plants
- Gaining knowledge about the process of plant growth - from seed to plant.
- Raising awareness about sustainable gardens
- Developing creativity and design skills
- Raising learners' self-confidence about the positive impact of their creations towards the protection of nature.

4. Target group

6 – 14 years-old learners

5. Necessary materials

- Old paper or newsprint paper (of your choice)
- Water
- Blender
- Food coloring (of your choice)
- Seeds for planting (herbs, flowers, vegetables of your choice)
- Sieve or frame with a net (metal hanger and tights is also an option)

- A bowl
- Spatula
- Paper towels or cloth
- Felt-tip pens
- Writing utensils
- Thicker paper sheets
- White paper sheets
- Cookie molds
- Ornaments for decoration (of your choice)
- Template for making a gift box (attached)
- Printer

6. Duration

60 minutes and 24 hours for drying of the mixture

7. Main activities

Activity 1

The educator discusses with the learners the concepts of selection, recycling and reusing. For a certain period of time the learners select paper at home and at school. Part of that paper is used to make the packets of recycled paper with seeds. Before starting the activity the educator explains the whole procedure and introduces them to the activity of recycling old paper and making recycled paper with seeds.

The educator divides the learners into teams and assigns each team a special task.

The paper is torn into small pieces. The small pieces of paper are placed in a blender. We add some water to the blender so as to cover the paper. For better results we use warm water. The paper and the water are blended together until we get a thick mixture. Then the mixture is poured from the blender into several bowls depending on how many types of seeds we intend to use. The seed is added to the mixture in each bowl. We stir the mixture carefully so as not to damage the seeds. Food coloring can be added to the mixture (depending on the desire and the imagination of the learners). The mixture thus prepared is placed on a sieve or frame with a net and it is lightly pressed to squeeze out the water. The resulting mixture is left to dry as a whole piece, or it can be poured into cake molds. We put the cake molds with the mixture in a warm place to dry.

Activity 2

After the formed pieces or shapes made of recycled paper with seeds have dried, the learners stick each shape on a thicker, small sheet with glue and gentle pressure. Pieces or shapes glued in this way can be put in small boxes and look like gifts. They can then design a seed planting guide that explains the process of planting seeds and through that process learn and understand the life cycle of plants.

Ex. let the instruction read like this: "You gently peel off the forms with seeds from the paper and place them in a container with soil, and put a thin layer of soil on top of them. At the end, put a little water."

Optionally, the instructions can illustrate the plant that will grow from the seed.

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Optionally, the instructions can illustrate the plant that will grow from the seed.

8. Final activities – drawing a conclusion

The prepared packages can be shared with learners from other classes, distributed in the community or sold at an event. The second option is that the learners plant the packages in pots that they place in their classroom, plant them in the school yard/garden or in their home. After completing the activity, encourage learners to share their experiences and conclusions from the activity. Discuss with learners the importance of recycling and sustainable use of resources, as well as the importance of sustainable planting. Also encourage them to think about the importance of seeds, the process of plant growth and development and how paper recycling can contribute to protecting the environment.

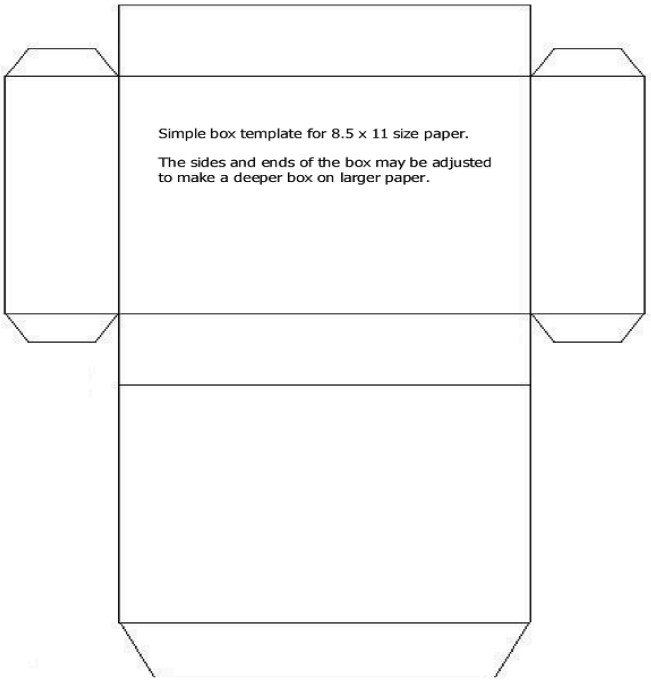
9. Reflection – overview of the goals

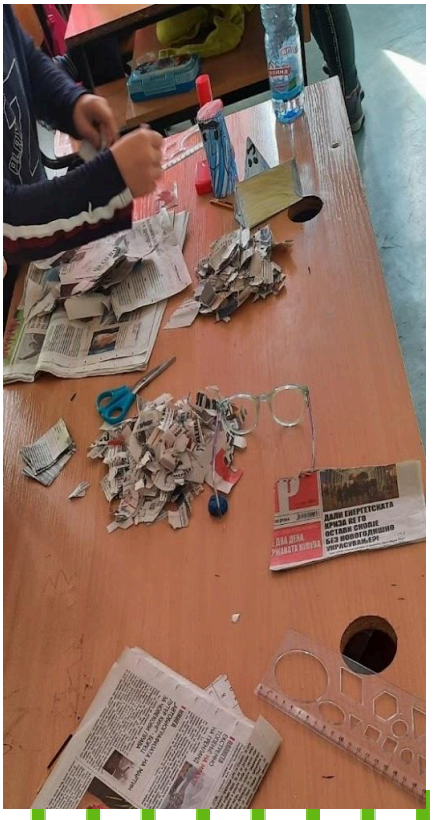
- What did you learn from this activity?
- What was most interesting about the activity for you?
- How do you feel after completing the activity?
- Would you change anything in this activity?
- How could we involve more learners or the community in the activity?
- How can the activity be applied in everyday life?

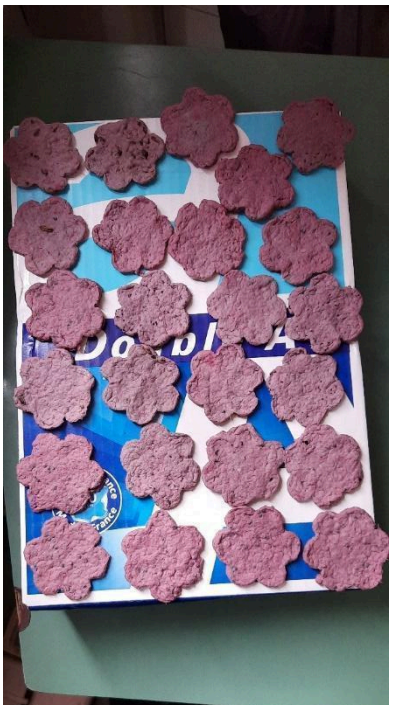
Through this reflection the learners can present their opinions and experiences, and the educator can get important information about the success of the activity and ways to improve it in the future.

10. Inspiration

Appendix no. 1







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11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

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6.6 Pollination station

1.Type of activity

Classroom activity and Outdoor activity

2.Topic

Pollination paradise

3. Learning objectives

- Learners learn about the pollination process in plants and why it is important to their life cycle
- Learners learn to identify the different types of pollinators (bees, butterflies and other insects)
- Developing responsibility towards nature
- Raising awareness for the protection of pollinators
- Understanding the importance of pollination and their connection to ecosystems
- Developing scientific skills through research and experiments
- Developing and encouraging creativity.
- Encouraging working in pairs and teams.

4. Target group

6 – 14 year-old learners

5. Necessary materials

- Artificial flowers (made of paper or fabric)
- Small containers of colored powder (representing pollen)
- Self-adhesive tape or double-sided adhesive tape
- Wooden sticks (spatulas)
- Sheets of paper or thicker cardboard
- Stapler
- Straws
- Liquid glue
- Safety rounded tip scissors
- Colors of your choice
- Open space
- Timer or stopwatch

6. Duration

90 minutes

7. Main activities

The educator begins with a brief explanation of what pollination is and why it is important for plants and animals. The learners watch a short presentation or video about pollination and pollinators. Use examples like bees, butterflies, and other pollinators that play an important role in the pollination process.
Introduce the children to different types of flowers or flower patterns. Encourage them to explore and identify the different parts of a flower.
First, divide the learners into pairs or groups (of your choice). Divided in this way, the learners make paper flowers with stems and hats with bee antennae (according to their imagination and creativity). Then they put double-sided adhesive tape (or a piece of self-adhesive tape) on the wooden sticks or spatulas.
Take the learners to the school yard and divide them into two teams. One team will be flowers and will form a flower garden, while the other team will be bees and will form a "Beehive".
Explain the activity to the learners that bees have a mission to collect pollen from flowers and transfer it to other flowers for pollination. Explain the concept of pollination, emphasizing that bees play a key role in transferring pollen between flowers, leading to the production of seeds and fruits.
Pour pollen, i.e. colored sparkles or colored powder of your choice (sugar with food coloring) on each flower. Explain to the children that they will act as pollinators (bees, butterflies, etc.) and their job is to transfer the pollen from one flower to another.
Show them how to collect the "pollen" using the wooden sticks or spatulas with adhesive tape on it and transfer it to another flower by gently pressing in the middle of the flower.
Start the game and let the children move around the flower garden, collecting pollen from one flower and transferring it to another.
You can set a time limit to add excitement and challenge to the game. Encourage the children to work quickly, but also carefully to complete the task within the time limit.
After the game, gather the children and discuss their experience. Ask them to share their observations or challenges they faced during the activity.
Emphasize the importance of pollination in plant reproduction and how different pollinators play a key role in this process.

8. Final activities – drawing a conclusion

- Start a group discussion where the learners can share their experiences from the activity.
- Discuss what the learners observed during the pollination mission.
- Encourage them to share their experiences.
- Ask them questions such as: "What did you learn about pollination?" and "Why is it important to protect pollination?"
- Discuss the importance of bees and pollination in plant growth.
- Discuss how the pollination process contributes to the food we eat.
- Tell the children to create a collage of pictures, illustrations and text that represent their findings and conclusions about pollination.

- If the children created artwork or models during the activity, organize an exhibition where they can display their creations and explain how they relate to pollination.
- Ask the children to write a few sentences or an essay about what they have learned about pollination and how they feel about the importance of this natural process.
- Finally, encourage the children to present their conclusions to the group, parents or other learners

9. Reflection – overview of the goals

- Learners can discuss how they felt during the activity.
- Did they have fun? Did they feel motivated?
- The learners can reflect on how well they understand the process of pollination and why it is important for plants and the ecosystem as a whole.
- Did the learners achieve the goals that were set for the activity?
- Did they understand the importance of pollination and can they identify different types of pollinators?
- Can they apply their new knowledge in different situations?
- Do they need additional information or exercises?
- How can they upgrade their learning in the future?

10.Inspiration

"Pollination paradise" refers to an environment abundant with flowering plants, pollinators and all the necessary elements for successful pollination. It is a living ecosystem where pollinators such as bees, butterflies, birds and other insects thrive, contributing to plant reproduction and the overall biodiversity of the area.
In a pollination paradise, you can expect to see a variety of colorful flowers blooming throughout the seasons, providing plenty of nectar and pollen for pollinators. The environment should be rich in a variety of plant species, each of them adapted to attract specific pollinators through their colors, smells and shapes.
Such habitats are necessary to maintain healthy ecosystems and support the production of fruits, vegetables, and other crops that rely on pollination for reproduction. Creating and preserving a pollinator's paradise is crucial for environmental preservation and food security.
Efforts to establish a pollinator's paradise often include planting pollinator-friendly gardens, minimizing pesticide use, preserving natural habitats, and raising awareness of the importance of pollinators in our ecosystems.
Some of the most famous pollinators are:

1. **Bees:** Bees are the most famous pollinators that transfer pollen from one flower to another. They are particularly important for the pollination of many types of cultivated plants.
2. **Butterflies:** Butterflies are beautiful pollinators that transfer pollen as they fly from flower to flower in search of nectar.
3. **Wasps:** Some species of wasps, especially the pollen wasps, transfer pollen while gathering food for their larvae.
4. **Birds:** Birds, such as hummingbirds, can be pollinators for certain types of plants, especially those with long tubular blooms.

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.7 Sensory garden

1. Type of activity

Classroom activity and Indoor activity

2. Topic

Pollination paradise

3. Learning objectives

- Developing the sensory abilities of learners by stimulating different senses such as touch, smell, taste, hearing and sight
- Understanding the importance of plants in the environment.
- Understanding the life cycle of plants from seed to fruit.
- Understanding the role of pollinators in the creation of new plants.
- Understanding the importance of the habitats for pollinators.
- Encouraging learners' creativity by creating different elements and materials in the garden that will stimulate different feelings.
- Improving children's motor skills through activities such as planting, creating different elements in the garden and taking care of them.
- Developing gardening skills
- Raising children's awareness of the importance of nature protection and the sustainable use of resources.
- Improving children's self-esteem through participation in the creation of the sensory garden and their ability to care for it.

4. Target group

6 – 14 years-old learners

5. Necessary materials

- Various types of seeds (lavender, mint, basil, milkweed)
- Gardening tools
- Working gloves
- Chairs, cushions (decorations of your choice)
- Sheets of paper, cardboard (of your choice)

- Notebook
- Writing utensils
- Markers or colors of your choice
- Round tip safety scissors

6. Duration

The activity lasts for 90 minutes and the observation of changes takes several weeks.

7. Main activities

Start the activity by telling a story:
For a long time, I had the feeling that I was invisible. Sometimes, that feeling made me sad. But my grandad and I made a garden in our yard, when he came to visit us. So, whenever I am sad, I go to the moon garden. I sit alone at dusk and enjoy spending time in the garden surrounded by fragrant flowers. The pleasant floral scent attracts nocturnal pollinators that I can hear and see. I think of my friend Svetle. I wonder what she's doing now.
The moonlight doesn't distract me. The young moon skilfully illuminates the blossoms that open for her at night. They are bait for the winged lanterns - fireflies. Their life cycle is longer than that of typical insects. They spend several months or even a year-old learners underground before they become adults and ready to reproduce. Adult fireflies are the ones we see lighting up humid summer evenings and feeding on pollen and plant nectar. They are my shining guests, tonight. The festival of fireflies can begin!
A luminous spell engulfed the Moon Garden. I was also enchanted when I felt Svetle's embrace in which the feeling of invisibility disappeared.

After finishing the story, start a discussion about it. Ask learners questions about what they understood from the content. Explain how important plants and pollinators are in the environment.
Then, explain the pollination process to them.
All plants reproduce.
Most plants produce seeds.
The seeds grow into new plants.
Many of the green plants have flowers.
Flowers produce pollen.
Pollen grains are transferred from one flower to another when the plant reproduces.
Pollen grains are carried by the wind or an insect.
Pollen grains are present in the anthers of stamens. Pollinators (bees, butterflies, birds, etc.) transfer pollen from one flower to another.
The flower's nectaries are located on its petals Pollinators feed on the nectaries and pollen attaches to their body. Seed and fruit develop only when the flower is pollinated. The seeds and fruits are transferred by:

- the wind
- water
- animals
- people

Then, explain to the learners that you will make a sensory garden in the school yard, in which they should plant various flowers and herbs in order to create new plants that will attract various pollinators (insects and birds).
A few days before you start the activity, ask the learners to bring in different types of herbs and plant seeds. Opt for flowers and herbs that are easy to grow. Include herbs like lavender, mint and basil, which not only attract pollinators, but also provide sensory experiences for children. Plant plants that attract butterfly caterpillars, such as milkweed. Include plants with landing platforms and tubular flowers that make them accessible to pollinators.
Take the learners to the schoolyard and find a location for your 'Sensory Garden'. Create specific areas in the garden to attract butterflies and bees. After determining the location, provide learners with working gloves and the necessary gardening tools.
Divide the place where you will make the "Sensory Garden" into two sections. In the first section, the learners will plant the seeds or small plants. Show the learners how to do this. Explain proper care and watering techniques. While they are planting, help the learners to make not too deep holes to plant the seeds.
The other section will be an "Observation Station" where the learners can enjoy the buzzing and flying of pollinators and observe changes in the garden. In the "Observation Station" you can place chairs or cushions so that the learners can closely watch the pollination process.
Create educational signs together with the learners. Use colorful and attractive visuals and simple language. Place the educational signs around the garden so the learners can learn about pollinators, their importance and the pollination process.
Optionally you can create a butterfly station with shallow bowls of water and stones for the butterflies to drink from. Set up insect hotels or bee boxes where children can observe pollinators. Set up a flower dissection station where the children can explore the parts of a flower and learn how the pollination process happens.

8. Final activities – drawing a conclusion

After completing the activities, let the learners sit in their "Sensory Garden" and describe the process of creating the garden in their notebooks. Then discuss it.
Focus on the following questions: How will they apply organic gardening practices and natural pest control methods? How will they maintain the garden for pollinators by avoiding the use of pesticides and herbicides? Encourage the learners in garden maintenance tasks such as watering, weeding and picking up dried flowers.
Direct learners to keep a “Sensory Garden” journal each day. Encourage the children to regularly observe the garden - the growth process of flowers and herbs and how they attract the various insects that carry out the pollination process. That way they will keep a pollinator diary. Learners can record, photograph, draw the types of pollinators they see, the flowers that attract those pollinators, and other interesting things they notice. Encourage the learners to touch the leaves, smell the fragrant blossoms of the flowers, and observe their vibrant colors. Use the journal as a tool for ongoing learning and reflection.
It will also give them pleasure when they can make natural tea, soap, etc. from the planted herbs (mint, thyme, mountain tea, rosemary).
The educator can take photos of the process of creating the sensory garden and share them with other educators and learners from the school, parents, etc. That way, you will be able to encourage them to get involved in the "Sensory Garden" project.

By creating a pollination garden designed by kids, for kids, you'll give them valuable hands-on learning experiences, a highly developed awareness of the vital role of pollinators, and a strong sense of attachment to nature.

9. Reflection – overview of the goals

After they finish the activities, the educator leads a discussion with the learners.

- Did you find the activities interesting?
- Which part of the activity was most interesting to you?
- What would you change in the activities?
- How did you feel as you planted the seeds?
- Would you apply the same to your yards or parks?
- Would you share your experiences with other learners?
- Through the activities, did you understand the importance of different pollinators?

10. Inspiration

Creating a pollinator garden is a wonderful way to connect children with nature and teach them about the importance of pollinators. Pollinators are living organisms that transfer pollen from one floral structure (such as a flower or cone) to another, making the pollination process possible. Here are some types of pollinators:

- Bees**:** Bees are one of the most famous pollinators. They collect pollen and nectar from flowers, and as they feed, the pollen is transferred from one flower to another.
- Butterflies**:** Butterflies are pollinators that are often seen in flower gardens. They feed on nectar and transfer pollen with their wings.
- Wasps: Wasps are often observed as pollinators, especially in some types of plants where bees are not as efficient.
- Flies: Some species of flies, especially flies of the Syrphidae family (also known as "bee flies"), are pollinators.
- Butterflies**:** Some species of butterflies visit flowers for food and transfer pollen, although they are not as efficient as bees or butterflies.
- Birds**:** Some birds, such as hummingbirds, are pollinators, especially in regions where bees are not as common.

These are just some of the most well-known types of pollinators, but there are other living organisms that play an important role in plant pollination.

Humans play a significant role in pollination, both directly and indirectly. People grow a variety of plants in gardens, farms, and orchards, many of which rely on pollination to produce fruits, vegetables, nuts, and seeds. By growing these plants, people support pollinators by providing them with food sources and habitats. Some people engage in beekeeping, where they maintain colonies of bees or other types of pollinators. These managed colonies can be used to pollinate crops, thereby improving agricultural productivity. Individuals and organizations can engage in habitat management practices to support pollinators. This includes planting pollinator-friendly flowers, preserving natural habitats, and reducing the use of pesticides and herbicides that harm pollinators. Scientists and conservationists study pollinators and their habitats to better understand their ecology, behavior and the threats they face. Research findings inform conservation efforts aimed at protecting pollinator populations and promoting biodiversity.

Educating the community about the importance of pollinators and the threats they face is critical to promoting conservation efforts. People can support pollinators by making informed choices about landscaping practices, pesticide use, and consumer behavior. Governments and regulatory bodies can enact policies and regulations to protect pollinators and their habitats. This can include measures to limit the use of harmful chemicals, establish protected areas for pollinators and promote sustainable agricultural practices.
Overall, humans have a large impact on pollination through their actions, and pollinator conservation efforts are essential to ensuring ecosystem health and food security for future generations.
https://www.youtube.com/watch?app=desktop&v=oa2DzpUeCPA
https://www.youtube.com/watch?v=obfXY8dT840



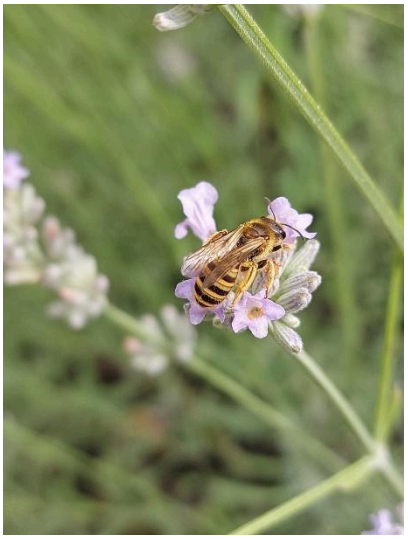



Photo credits : Kiril Arsovski

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.8 Creating a pollinator puppet

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Pollination paradise, City for all senses

3. Learning objectives

- Understanding the role of pollinators and how they help in the process of pollination and reproduction of plants.
- Learning how the loss of pollinator habitats threatens an ecological disaster.
- Raising awareness about returning pollinators to the city.
- Developing fine motor skills
- Improving communication skills
- Developing creativity
- Encouraging teamwork
- Developing logical thinking

- Encouraging the creation of healthy relationships between man and nature.

4. Target group

6 – 14 year-old learners

5. Materials needed

- A wooden spoon
- Liquid glue
- Safety rounded tip scissors
- Hard paper sheets (coluors of your choice)
- Felt tip pens
- Writing utensils (pencil, eraser, etc.)
- Ornaments for decoration (of your choice)
- Computer or smart board (of your choice)

6. Duration

120 min. (The best season for this activity is spring)

7. Main activities

Activity 1

Start the activity by listing various plants that learners encounter in the immediate environment. Lead a discussion about the importance of plants through asking few questions. Why do you think plants are important? What benefits do we get from them? How would you protect the plants? What would you do to increase people's awareness of their importance? Do you know how plants reproduce?

Then explain the pollination process to them.

All plants reproduce.

Most plants produce seeds.

The seeds grow into new plants.

Many of the green plants have flowers.

Flowers produce pollen.

Pollen grains are transferred from one flower to another when the plant reproduces.

Pollen grains are carried by the wind or an insect.

Pollen grains are present in the anthers of stamens. Pollinators (bees, butterflies, birds, etc.) transfer pollen from one flower to another.

The flower's nectaries are located on its petals Pollinators feed on the nectaries and pollen attaches to their body. Seed and fruit develop only when the flower is pollinated. The seeds and fruits are transferred by:

- the wind
- water
- animals
- people

Through brainstorming, have learners list several types of pollinators. Then play instrumental music for them, and let the learners dance like bees, butterflies and hummingbirds.

https://www.youtube.com/watch?v=xHPFm46Hyek
https://www.youtube.com/watch?v=mrpRLiw1324
https://www.youtube.com/watch?v=43PRVtGk2To
Prepare the needed materials and explain the activity - each learner has to make a pollinator puppet. Make sure they have the necessary materials to work with. Instruct each learner which pollinator puppet he/she has to make (a bee, a hummingbird or a butterfly).
Making a bee: Have the learners draw eyes and a mouth on the top of the wooden spoon using felt tip pens.Then they draw the body of the bee on thicker yellow paper sheet and cut it out. After that they glue black paper strips on the body of the bee. The learners stick the body on the handle of the spoon. Then they draw the bee's wings on thicker paper, cut them out and stick them on the body. Finally, they draw black lines on a sheet of paper about 5 mm thick and stick them on the bee's head. The bee puppet is ready.
Making a butterfly: Have the learner draw the eyes and mouth of the butterfly on the top of the wooden spoon. Then they cut strips of 5 mm thick from black paper and glue them to the butterfly's head. After that the learners draw the body of the butterfly on thicker pink (or other colour of their choice) paper sheet, cut the body out and glue it to the handle of the spoon. Now they draw and cut out the wings of the butterfly from a sheet of paper in a different colour and glue them to the back of the body. They can decorate the wings using their imagination and creativity.
Making a hummingbird: The learners draw an eye on the upper part of the spoon. On thicker yellow paper sheet, they draw the beak and cut it out. Then they glue the beak to the spoon, so as to get a profile of a hummingbird. On thicker paper sheet the learners draw and cuts out the body of the hummingbird. They glue it to the handle. Finally, they draw wings, cut them out and glue them to the body. If desired, the learners can decorate the bird.

Activity 2
The educator and the learners go to the school yard and take the pollinator puppets the learners have made. The learners are divided into groups of three (3) and in each group there is one bee, a butterfly and a hummingbird. Give each team 10-15 min. to come up with a short story/dramatization, so as to act out the transfer of pollen from one flower to another.
Example:
The bee buzzing: Hey, butterfly look at this lovely flower garden! Mmmm… this red flower looks delicious! Oh, and how nice it smells! This looks finger-licking good!
The butterfly: Hold on, busy bee! Leave some for me too! I would also enjoy the delicious flower nectar. I'm hungry and I haven't seen such a wonderful flower garden in a long time!
The song of the hummingbird is softly heard.
The hummingbird chirping: So, there you are my dear friends! I've been looking for you everywhere! Hey, let's stop arguing and enjoy the delicious nectar together. Busy bee, go and feed on the yellow flowers, you butterfly on the pink ones, and I on these red flowers.
Then the bee, the butterfly and the hummingbird fly happily in all directions.
Ask learners to come up with short, interesting stories, and then let each team act out their short dramatisation. Encourage the children to be creative and have fun.

8. Final activities – drawing a conclusion

- Initiate a discussion with the learners about the importance of pollinators to the ecosystems. Discuss the importance of pollinators and pollination in plant growth.

- Discuss how the pollination process contributes to the food we eat.
- After the discussion, the educator and the learners clean up the school yard. They pick up the litter, collect the fallen leaves and water the plants and the grass.

9. Reflection – overview of the goals

After finishing the activities, the educator initiates a discussion with the learners.

- Did you enjoy today's activities?
- Which part did you find most interesting?
- What would you change in the activities?
- Did these activities help you understand the relationship between pollinators and plants?
- Did you learn about the importance of pollinators in the environment?
- What would you do to protect pollinators in the environment?
- How would you raise the awareness of the other learners about the importance of pollinators in nature?
- Would you perform the puppet show in front of the other learners?

10. Inspiration

https://www.youtube.com/watch?v=obfXY8dT840
https://www.youtube.com/watch?v=fOMbAegJ1wQ
https://www.youtube.com/watch?v=qWc8X6YeTv8
https://www.youtube.com/watch?v=MQiszdkOwuU

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.9 I'm making a butterfly feeder

1. Type of activity

Activity in the classroom and Outdoor activity

2. Topic

Pollination paradise, City for all senses

3. Aims

- Raising the awareness among children about climate change and the impact on butterflies

- Developing creative skills
- Introducing the terms and the significance of climate change and global warming on the life of butterflies
- Raising the awareness of the importance of this type of pollinators
- Developing research skills and critical thinking

4. Target group

6 – 14 year-old learners

5. Materials needed

- Two plastic cups (to protect nature, it is best to use cups that you have already used) or a small plastic container with a wide opening of your choice (cream, fruit yogurt, etc.)
- Cotton
- Thicker thread or hemp
- Water
- Sugar
- A spoon
- A pencil
- Notice board pins
- Scissors
- Bags of crisps (optional shiny paper that doesn't leak water)
- Glue

6. Duration

60 minutes

7. Main activities

Before starting this activity, introduce the children to the life of butterflies.
Ask them what would happen if the flowering trees were cut down and the flowers dried up? What would that mean for butterflies?
Could such a terrible thing really happen? Unfortunately, humans cause climate change every day and threaten the life of plants and animals. If the butterflies do not have food, they may die. That's why today we will make a feeder for butterflies from recycled material, from plastic cups that we use every day and crisps bags (according to the children' choice), and in such a way we actually reuse, i.e. get a new product.
Before starting the activity, ask the children to carefully follow your instructions.
Ask the children to make openings on the opposite sides of the edge of the cup using the notice board pins (tell them to be very careful, so that they do not hurt themselves, or you might help). Then, using a pencil they enlarge the holes so that they can pass a piece of thicker thread or hemp through the holes.
They also make an opening at the bottom of the cup, again with the notice board pins and widen the opening with a pencil. The children insert a piece of cotton through the opening, so that half of the cotton is inside, and the other part comes out of the bottom of the cup.

From crisps bags, or whatever you have chosen, children should cut flower petals. Next, ask them to stick the petals with a glue on the lower part of the cup around the piece of cotton, sticking out of it to make a flower.
In the other cup, ask the children make a solution of nine teaspoons of water and one tablespoon of sugar. The prepared solution is placed in the already made cup that looks like a flower with colorful and shiny leaves.
Together with the children, go outside in the school yard, or the nearest park and hang the cups and feeders made in such a way in a place where the butterflies can easily find them. For example, near flowers or a green area. Check them from time to time if there are butterflies on them (but be careful not to stand too near the feeder, so that the butterflies are not scared).
Sugary water is similar to nectar (the liquid that butterflies drink from flowers is called nectar. The butterflies have a long tube called a teat that enables them to drink the nectar from flowers). The shiny and colorful petals will attract the butterflies to the food that is on the cotton.

8. Final activities – drawing a conclusion

After you have finished the activity, encourage the children to keep a journal and keep writing down what they observe. Help the children follow the butterflies and watch them use the feeder. This will be a great opportunity to learn and explore the environment.
They can also experiment by making different sounds (pleasant, unpleasant, loud, quiet) and investigate which sounds the butterflies are afraid of.
Encourage the children to present their work to other children, or to the parents. They can explain how they made the feeder, what materials they used, and how it works.
Place all feeders in a visible place and allow the children to look at and rate each other's feeders. This can be done as part of an exhibition. Finally, encourage them to draw their own conclusions.
This activity is a great way for kids to learn about nature, develop creativity and motor skills, and have fun creating something that can help animals.

9. Reflection – overview of the goals

- After completing the activities, discuss it with the children.
- Did you like the activity?
- What did you learn about butterflies?
- How do you think your feeder will help the butterflies?
- How will you apply what you have learned in your everyday life?
- What would you do to attract butterflies to your environment?
- How would you raise awareness among others about the importance of butterflies?
- What did you like most about the activity? (the materials they used, or just the creative component itself)
- Which part of the activity was most difficult and how would you improve it?
- What would you change about this activity?

10.Inspiration

Colorful, graceful and even a little mystical, butterflies are probably one of the most beautiful creatures on the planet. They are the subjects of stories, poems, visual art, and even spiritual reports. But these winged creatures don't just exist to catch our attention with their vibrant colors. Like all living things, butterflies are essential to our ecosystems. When the number of butterflies and moths changes, it tells a story about the health of our environment. So, you might be wondering, why exactly do we need butterflies? And, if they are endangered, what are the reasons?

1. The role of the butterfly - areas filled with butterflies, moths and other invertebrates benefit from pollination and natural pest control. Butterflies and moths are also an important part of the food chain, providing food for birds, bats and other animals.

2. Fragility - As you would expect, butterflies are delicate animals and therefore sensitive to change. When they struggle to survive, it is a warning about the health of our environment.

3. Temperature changes - From a weather perspective, butterflies are emerging earlier than in the past, and if they emerge too early, they may encounter frost and die; also they could emerge in early spring before plant sources are available and they could starve.

4. Storms — Severe weather causes millions of butterflies to die. The cold and humidity from these extreme storms can be very threatening to butterflies.

5. Habitat Loss - Butterfly habitats are being destroyed en masse around the world. In North America, much research is being conducted on monarch butterflies, which are at risk due to the loss of milkweed. Milkweed is rapidly disappearing due to urbanization, industrialization and the widespread use of herbicides. Female monarch butterflies use milkweed to lay their eggs. When they hatch, the larvae and caterpillars feed on milkweed leaves.

6. Deforestation - Monarch butterfly research also tells us that these butterflies depend on evergreen trees to shade sunlight and provide vital resting space, warmth and protection.

7. Intervention - Fortunately, the awareness is increasing, especially regarding the fall of the monarch butterflies. During a meeting in February, the USA president Barack Obama, the Mexican president Peña Nieto and the Canadian prime minister Stephen Harper agreed to form a task force to preserve the monarch butterflies. The movie "Flight of the Butterflies" and other recent media coverage are bringing much needed attention to this issue.

8. What you can do - Start planting! If you want to plant milkweed for the butterflies to lay their eggs or nectar producing plants to help the adult butterflies, check www.flightofthebutterflies.com or other websites to see what type of milkweed is right for your area . Ask your local garden center for help finding butterfly plants that will bloom in your region. You can plant a butterfly garden in very little space, even in a window box. Some websites allow you to track butterflies to help scientists measure population changes.
https://www.youtube.com/watch?v=jfCt_iYVKcA (a link on climate change and butterflies in the world)

11.Explanation for children with disabilities: You will find an addition in the next activity 6.10

6.10 I'm making a butterfly feeder for children with disabilities

In case you have children with disabilities in your class, you can include them in the implementation of the activities.

First, show children photos of different butterflies and by asking questions encourage them to describe the butterflies. Then explain the activity to them. You make the holes in the cup, and have the children put the cotton in the cup. Also, help children cut out a flower shape and then have them glue the flower themselves. Encourage them to make their own solution to attract butterflies. In the closing activities, allow the children to express their impressions of the activity, and then encourage them to illustrate them in the journal.

6.11 Making a hummingbird and a flower in a combined technique

1. Type of activity

Activity in the classroom and Outdoor activity

2. Topic

Pollination paradise

3. Learning objectives

- Getting to know the hummingbird, its role and importance in the pollination process
- Expanding knowledge about the importance of pollination and the role of different pollinators, such as butterflies, bees and hummingbirds in the plant pollination process.
- Expanding knowledge about the importance of sustainability and environmental protection, with a particular focus on responsible behavior towards nature and animals
- Encouraging learners to select, recycle and reuse materials
- Development of social skills and teamwork
- Developing creativity among learners through the opportunity to use a combined technique to create a picture
- Developing fine motor skills

4. Target group

6 – 14 year-old learners

5. Necessary materials

- white sheet of paper (preferably from a drawing pad)

- white sheet for printing the bird template
- watercolor paint
- tempera or acrylic paint (of your choice)
- brushes for water colour and tempera paint
- pieces of cardboard
- toilet paper or napkins (of your choice)
- sheets of newsprint paper
- glue (preferably stick)
- round tip safety scissors
- markers
- glitter sequins or other decorations (of your choice)

6. Duration

Around 1-2 hours, including the time for crafting and drying

7. Main Activities

Introduce the learners to the hummingbird and several different types of flowers using pictures, a video, or a short presentation.
Begin with a brief discussion of pollinators and their importance to nature. Explain to the children what pollination is and how different insects and birds, including hummingbirds, play an important role in this process.
Point out that in today's activity they will make hummingbirds and flowers in a combination technique.
First, the learners paint a sky and grass background on a white paper sheet using watercolor paint, (optionally they can add their own details on the painted background)
They draw the parts of the hummingbird, looking at the example from the template. Then the learners cut the parts of the bird. They stick shredded pieces of toilet paper or napkins on the body and head of the bird. Then they paint them using watercolor paint.
After that, they draw the wings and the tail of the bird on a piece of cardboard, cut them out and paint them with tempera or acrylic paint (of their choice and can also add glitter sequins).
They draw flower petals on newsprint paper, and then cut them out.
Then all the crafts should be dried well.
Print out the hummingbird template for children with developmental disabilities.

8. Final activities – drawing a conclusion

After all parts of the hummingbird and the flower have dried, the learners glue them to a sheet of drawing paper and make a design of their choice.
When all the learners have finished their craft, they make a mini exhibition and present their creations. After the exhibition, the educator and the learners discuss what they have learned.
Each learner explains which techniques he/she used to create the artwork.
Learners discuss pollinators and the pollination process, pointing out that the hummingbirds because of their characteristics, are considered one of nature's most efficient pollinators. Therefore, they are very important for the survival of many plant species.
Learners discuss how recycled materials can be used for creating beautiful artwork.

Learners think about the importance of environmental protection and how their activities can affect the ecology.

9. Reflection – overview of the goals

Ask the learners the following questions:

- What was most interesting to you in the process of making hummingbirds and flowers?
- Did you enjoy the activity?
- What did you learn?
- Which techniques and materials were the most interesting or the most difficult to work with?
- How did you feel while working together with your classmates?
- Did you and how (if yes) help each other?
- What did you learn about pollination and the role of different pollinators?
- Would you use recycled materials again to make an artwork?

10. Inspiration

Here are some interesting facts about the hummingbird:

- **Smallest birds:** Hummingbirds are the smallest species of birds, and their weight can vary from 2 to 20 grams, depending on the species.
- **Wing speed:** Hummingbirds are known for their incredible wing speed. Most of their species can fly at a speed of 30 to 45 kilometers per hour, and some species can fly up to 80 kilometers per hour.
- **Endurance:** Although small, hummingbirds are hardy birds and can make very long migrations. Some species of hummingbirds can fly up to 2000 km during migration.
- **Diet:** The main food of hummingbirds is nectar from flowers, which they collect with long tongues adapted for this purpose. In addition to nectar, hummingbirds also eat insects as an additional food source. Hummingbirds have a long, tube-like tongue that they use to collect nectar from flowers. They put this tongue deep into the flower, which increases the chance of contact with the pollen.
- Hummingbirds are often attracted to certain types of flowers, which increases the chance of pollinating the same type of plant and producing fruits and seeds.
- **Colours:** Hummingbirds are characterized by bright, mostly metallic colors. They are known for their colourful feathers and thus creating beautiful colour reflections under the sun's rays.
- **Nocturnal:** In most cases, hummingbirds are very active, being busy even at night. This is a result of their need for frequent feeding and the need to avoid competition for food with other bird species.

Here are some interesting facts about hummingbird migrations, feeding and life cycle:

- **Migrations:** Some species of hummingbirds make long migrations, involving journeys of hundreds or thousands of kilometers. For example, hummingbirds that live in North America winter in Central or South America. These migrations are incredible challenges for such small, but hardy birds.
- **Life cycle:** Hummingbirds have a short life cycle compared to other bird species. Female hummingbirds usually build nests and lay eggs in early spring, with young birds hatching

after about 2-3 weeks. Hummingbirds grow quickly and are usually able to leave the nest after about 3 weeks.

- **Fertilization:** Hummingbirds have an interesting method of fertilization where the male hummingbird has a territory that it defends from other male hummingbirds. When female hummingbirds arrive in this territory, the males compete with each other for their attention, giving them specific flying displays.
- **Wintering:** In winter when there is not much food, many hummingbirds migrate to warm areas where they can find enough food. This migration is an important part of the life cycle of hummingbirds and helps their survival.

These facts about the migrations, feeding and life cycle of hummingbirds can be interesting and educational for learners who like to explore nature.

Source, private photos Slavica Nestorovska Damjanska

11.Explanation for children with disabilities: You will find an addition in the next activity 6.10.

6.12 Making a hummingbird and a flower in a combined technique for children with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.

From the pictures or presentation, encourage the child to describe the hummingbird. Provide him with the printed template and other necessary materials. Explain to him how to cut out the bird model correctly and glue it on cardboard. Let him tear the napkins into small pieces and

stick them on the cut template, then let him drip liquid paint to make it colorful. Help him draw flower petals independently on the newspaper paper and cut them out. At the end, let him glue the creation on a block of paper. After all the creations are dry, include him in the discussion to give his opinion on the best creation. Encourage the other classmates to give him positive comment on his paper.

6.13 Music and plants

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Sound vs Noise

3. Learning objectives

- The learners will learn about the basic needs of plants and what stimulates their growth and development
- They will become familiar with scientific methods, such as formulating a hypothesis, performing an experiment, collecting data and analyzing the results
- The learners will understand sound as a form of energy and how it affects living organisms, including plants
- They will try to understand the impact of human activity (sound) on nature and will gain awareness of the importance of environmental protection
- Through asking questions, performing experiments and analyzing the results, the children will develop their critical thinking skills
- The learners will develop their scientific skills such as observing, measuring, analyzing and drawing conclusions.
- The learners will develop their research skills.
- The learners will develop their creative skills.
- The learners will become self-aware of the environment around them.

4. Target group

6 – 14 year-old learners

5. Necessary materials

- Three (3) same plants (mint, basil or some of your choice)
- Three pots

- Smart phone or device that plays music (of your choice)
- Two (2) pairs of speakers
- Ruler
- Water
- Notebook or sheets of paper (of your choice)
- Writing utensils (pencil, pen, felt-tip pen of your choice)

6. Duration

two weeks (30 minutes a day)

7. Main Activities

The learners watch a short presentation or a video about the parts of a plant and what a plant needs for proper growth, the conditions needed, and also about the impact of noise on plants. The educator starts a discussion on the presentation/video the learners saw, and prepares them for doing the activity – making an experiment.
Firstly, the educator and the learners choose three (3) identical plants, preferably some that are suitable for growing indoors with a shorter growing cycle (if they have their own school garden, they can grow the plants from seed to a certain size before doing the experiment).
The learners are divided into three (3) groups.
Each group gets one plant to take care of.
The plants are placed in three different places in the classroom, or the room you choose for the experiment, but you have to make sure that they all have the same growing conditions (receive the same amount of light, water, etc.)
Before the beginning of the experiment, each group of learners will measure and note down the initial height of the plant, its number of leaves, flowers, the overall health of the plant, etc. They will write it down in their notebooks (younger learners who are not literate can draw the plants, or the educator can help them).
The first group will play classical music to their plant every day for 30 minutes (the speakers should be placed at the same distance and the sound volume should be the same every day).
The second group will play sounds of noise and traffic sounds for 30 minutes every day to their plant (the speakers should be placed at the same distance and the sound volume should be the same every day).
The third group will have a control plant, that is, their plant will not be exposed to specific sounds.
Every three days, each of the groups writes down in their notebook, or records, the changes of their plants.
When performing the experiment pay attention on the ethical conditions for the cultivation and development of plants.

8. Final activities – drawing a conclusion

After completing the experiment, each group of learners analyzes the obtained data, and then presents their observations. Encourage discussion with the learners about what they learned from the experiment and what conclusions can be drawn about the effect of sounds

on plants. Namely, variations in growth patterns, leaf development or overall plant health may be observed between the different groups. Some sounds can positively affect plant growth, while others can have a neutral or negative effect. Sounds and noise can have different effects on plants depending on their volume, frequency and duration. Encourage learners to think about what their data might mean and how they might share it with other learners, parents or in a media/magazine. Encourage learners to take actions to reduce noise, to think of ways they can reduce noise in their community. Guide learners to explore examples such as reducing the use of motor vehicles and creating places of peace and quiet.

9. Reflection – overview of the goals

- How did you feel while doing the activity – the experiment?
- Did you encounter any difficulties?
- What did you like the most?
- Did you learn something new?
- Can you apply what you learned in your everyday life?
- What would you change in this activity to make it better?
- Would you share what you learned?

10. Inspiration

Sounds and noise can have different effects on plants depending on their volume, frequency and duration. Here are some ways sounds and noise can affect plants:

- **Plants respond to sounds:** There is research showing that plants have the ability to respond to sounds. For example, some studies show that plants can grow faster when exposed to music of certain frequencies.
- **Stress**: High noise levels can cause stress in plants as well as animals. Stress can have a negative effect on the plant, including reduced growth, flowering and fruit production.
- **Limiting pollination**: Noise can have a negative effect on plant pollination. Sounds can scare off pollinators, such as bees and other insects, which can lead to reduced pollination and reduced fruit and seed production.
- **Impact on root development** Some research shows that sounds can have impact on plant root development. For example, some plants can grow away from noise sources as a result of their response to vibrations.

6.14 Music and plants for children with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.

Encourage him to draw the parts of the plant and with the help of questions to say what they are for. Then you can put him in one of the three groups of your choice. Let him explore the changes in the plant together with his classmates. Encourage the other children to help him if he

encounters any difficulty. At the end of the activity, let him express his observations written in a notebook, and have the other children applaud him in order to gain more motivation and self-confidence.

6.15 'E-book with sounds' from the environment

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Sound vs Noise

3. Learning objective

- Developing skills for integrating multimedia elements in digital format.
- Improving the ability to tell and write stories (development of language skills, spelling and creative expression).
- Developing awareness of the ecological significance of various sounds from nature.
- Raising awareness for the importance of nature and the environment.
- Developing observation and research skills.
- Developing digital literacy skills by using software to create, edit and present multimedia content.
- Developing creativity.
- Stimulate the senses (adding audio elements/sounds in the e-book can stimulate children's senses and encourage them to focus and analyze sound details).
- Raising self-confidence.
- Sharing the creations with the community.
- Developing critical thinking.

4. Target group

6 – 14 year-old learners

5. Necessary materials

- digital audio recorder or smartphone (of the choice of the educator/learners)
- computer or laptop (optional)
- internet
- software applications for creating an e-book (Book Creator, Story Jumper, Canva or other optional)

- LCD projector or smart board (optional)
- writing utensils (notebook, pencil, eraser...)

6. Duration

3 (three) 40-minute lessons

7. Main activities

Activity 1

Take the learners to the school yard, a nearby park, or a location of their choice. Explain to them what the purpose of the activity is. Tell them to bring a notebook, pencil and a mobile - smart phone, or an audio device of their choice (for learners from lower classes, the educator records the sounds).

Divide the learners into teams of 3 (three) or 4 (four) learners (depending on the number of learners). Give them instructions how they should record the sounds in the school yard (or the location you have chosen). Tell them to pay attention to the chirping of birds, the rustling of leaves, the noise of people, cars, etc. Let them try to get closer to the source of the sound so that the sounds can be louder (but also pay attention to their safety). They can also take pictures of the sources of sounds and use them for this, but also for other activities.

After the learners have finished recording, have them sit in a group and take out a notebook and a pencil. Ask them to close their eyes and focus on the sounds they hear around them. Then tell them to write down what they were thinking while listening to the sounds and how they felt.

Read them a story so that you give them ideas how to compose short interesting stories that will express their emotions while listening to the sounds.

An example of a story shared with learners:

Walking along the path, I came across a beautiful flower garden. It was full of colorful flowers. I went in to pick some for mom and butterflies in a thousand colors danced around me. I could hear the song composed by the buzzing of the bumblebees,and see the bees diligently collecting the pollen from the flowers. I said to myself: "The bouquet will make mom smile". I rushed home to surprise her. She met me at the door with a gentle smile. She looked at me kindly and hugged me. Then, she took the bouquet of flowers and put it in a vase with water. She was very happy.

Encourage the learners to read the short stories aloud and share them with their friends.

Activity 2

After the learners finish the first activity, the educator prepares them for the second activity. The learners remain divided into the same teams from the previous activity of 3 (three) or 4 (four) learners each (depending on the number of learners).

Take the learners to the IT classroom,or do the activity in your classroom if it's equipped with computers. Explain the activity to the learners and remind them that they should always take care of technology and use it carefully.

Each team should choose one story from the previously written ones (activity no. 1), and they will convert it into an e-form (if they have time they can use all the stories from their team).
Learners follow the app's instructions to make the e-book, making sure to add the recorded sounds (activity #1) throughout the project.
Each group continues with the creation of their e-book. (learners from the lower classes can create an e-book together with the educator).
Encourage the learners to design the pages, change the font of the letters, choose the color, etc. Let them use their imagination and be creative.
The educator monitors the learners' work and helps them, if needed.

8. Final activities – drawing a conclusion

After completing the e-books, encourage the learners to present them, allowing them to explain why they chose that topic, how the story goes, and how the sounds contributed to the whole experience. After each presentation, encourage the learners to provide constructive criticism and positive comments and share their opinion. They can share their e-books with other learners and thus motivate other learners to make e-books. They can also present their e-books to the parents. This activity enables learners to increase their digital literacy.
Finally, encourage the learners to explain what they understood and learned through these activities.

9.Reflection – overview of the goals

After the children finish the activities, the educator asks the following questions:

- How did you feel after completing the activities?
- Did you enjoy today's class?
- What did you learn today?
- Which part of the activity was most interesting for you and why?
- Did the activities help you develop your digital skills and creativity?
- Would you like to create e-books on other topics in the future?
- What new skills and knowledge did you gain in the process of making the e-books with sounds?
- What were the advantages and challenges of the teamwork?
- Do you think the sounds made the stories more interesting?
- What would you change in the activities?
- Would you share your experiences with other learners?
- The learner developed their skills to integrate multimedia elements in a digital format.
- The learner improved the ability to tell and write stories.
- The learner developed awareness for the ecological significance of various sounds from nature.
- The learner developed digital literacy skills using software to create, edit and present multimedia content.
- The learner developed his/her creativity.
- The learners stimulated their senses to add audio elements.
- The learners identified sounds (pleasant and unpleasant)

10. Inspiration

https://issuu.com/solutions/publishing/digital-book?utm_source=google&utm_medium=cpc&utm_campaign=&utm_term=&utm_content=&device=c&placement=&network=x&creative=&adgroupid=&campaignid=20948305862&gad_source=2&gclid=Cj0KCQjwlvW2BhDyARIsADnIe-LkEBCw5q_IKyHqBwlHmg8NqdGnDTmLzCXlvqUjU725YHFBenZALoAaAjT5EALw_wcB
https://www.youtube.com/watch?v=8rsr45TcOC4
These links explain how to create an e-book.

An "ambient e-book" is a concept that combines traditional e-books with audio elements that reflect the setting or atmosphere of a story. This may include:
Ambient sounds: Add background sounds, such as chirping birds, falling rain or city traffic, depending on the scene.
Character Voices: Include character voices to enhance dialogue and narration.
Sound effects: integrating specific sounds relevant to actions or events in the story, such as creaking doors or footsteps.
The goal is to create a more immersive reading experience by engaging multiple senses.

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.16 Analyzing sounds

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Sound vs. Noise (Recording sounds with a mobile phone: birds chirping, water gurgling, leaves rustling, rain falling, thunder, traffic noise, street noise, etc.)

3. Learning objectives

- Becoming familiar with different aspects of nature and how sounds are related to plants, animals and ecosystems
- Developing and raising awareness for the importance of protecting nature and biological diversity
- Developing creativity and imagination.
- Developing research skills and ability to draw conclusions.
- Developing critical thinking.
- Developing the senses

- Introducing to the diversity in nature.
- Identifying sounds (pleasant and unpleasant)
- Raising awareness for the impact of sounds on people
- Encouraging teamwork.
- Developing skills to group living things using simple characteristics to explain the grouping.
- Introducing and learning how to use different tools and applications for recording and processing sounds.

4. Target group

6 – 14 year-old learners

5. Necessary materials

- A mobile phone or other recording device of the learner's/educator's choice
- Location for carrying out the activity (schoolyard, nearby park or location chosen by the educator, nearby street, crossroads)
- Notebook or white sheets
- Writing utensils (pencil, eraser, sharpener, etc.)
- Crayons or felt tip pens of choice
- Protective equipment (umbrellas, raincoats etc. in case of rain)
- Transportation if going further than the school

6. Duration

few hours for recording sounds in nature and 30 minutes for recording traffic sounds.

7. Main activities

Activity 1

The educator introduces the learners to the impact of sounds on living organisms and biodiversity. Learners go through a visual presentation or photos on the topic and then discuss how they can explore it.

The educator prepares the learners for a walk in the nearby nature. In case of no possibility for it, you can go for a walk in the nearby park.

Make sure the learners bring a mobile phone or other sound recording device of their choice (for lower grade learners the educator will do the recording of nature sounds they point out).

When you arrive at the chosen location, explain to the learners what the goals of the activity are and how important it is to carry it out.

While walking through nature you can tell the learners stories about the animal and plant life in nature.

Encourage learners to ask questions about the natural world in order to increase their interest and curiosity about learning new things.

Explain to the learners that they should not make noise, so as not to disturb the animals whose home is nature. Encourage them to record the sounds they hear and to try to identify them. Direct them to pay attention to the chirping of birds, rustling of leaves. If there is a river

nearby let them listen to the gurgling of the water. Also allow them to get closer to the sound source, so they can record better quality sound.
The learners note down the sources of the sounds they recorded in their notebooks. Ask learners to sit in a circle and instruct them to close their eyes and continue listening to the sounds around them. Encourage them to make a drawing of a sound they hear (a sound of their choice).

Each learner presents his/her drawing, and then all the learners discuss the sounds they encountered in nature.
Let learners enjoy their favorite outdoor games before going back to school.
Remember to respect the environment and avoid disturbing wildlife while recording.

Activity 2
First of all, the educator reminds the learners that there are pleasant and unpleasant sounds and how they affect people and the entire ecosystem. The educator instructs them to try to identify some pleasant sounds (reminds them of the walk in nature) and some unpleasant sounds.
Prepare the learners to go to the nearby street/crossroads where they can can hear traffic noise. Each learner should bring a mobile phone or other device to record sounds (learners can also work in pairs). Younger learners will identify the sounds and the educator will be the one to do the recording.
While walking, the task for the learners is to record the unpleasant sounds they hear.
After completing the activity and returning back to school, the learners listen to the sounds they recorded and note them down in their notebooks.

8. Final activities – drawing a conclusion

After completing both activities, initiate a discussion with the learners about the sources and sounds they heard while in nature, and the sources and sounds from the nearby street/ crossroads.
Learners draw conclusions about the impact of different sounds on people and nature.
They discuss the possibilities of solving noise problems and how we can create pleasant surroundings - quiet and sustainable areas in the community.

9. Reflection – overview of the goals

After the children have completed the activities, the educator asks the following questions:

- How did you feel while recording the sounds?
- What were your expectations before the activities?
- What did you learn today?
- How do you experience the nature around you now?
- How do you experience the sounds around you now?
- Did recording the sounds enrich your feelings and senses?
- How can you improve the lives of various living creatures in the cities?
- In what way could you make people become aware for preserving the environment?
- How can you use the recorded sounds?

- Did you like the activities?
- Would you like to change something about the activities?
- The learners have developed their creativity and imagination.
- The learners have developed their ability for critical thinking.
- The learners have developed their skills for doing research and drawing conclusions independently.
- The learner is able to work in a team/pair.
- The learner is familiar with the diversity of nature.
- The learner is aware of the importance of living organisms in nature.
- The learner can group living things according to their characteristics.

10. Inspiration

https://www.youtube.com/watch?v=zSqWaUpihgQ
https://www.youtube.com/watch?v=p7XkZleu9aY

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.17 I discover sounds and make instruments from recycled material

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Sound vs. Noise

3. Learning objectives

- raising awareness about the importance of recycling and using recycled materials to create something new and useful.
- developing research abilities
- developing learners' creative abilities
- introducing learners to different materials that produce sounds
- developing musical abilities

- encouraging teamwork and sharing ideas
- developing fine motor skills
- developing critical thinking
- developing communication skills

4. Target group

6 – 14 year-old learners

5. Materials needed

Paper plate shaker:

- Seeds of your choice (beans, rice, sesame, etc.)
- Paper plates
- Liquid glue
- Paint (of your choice)

Drums from old pans and spoons:

- Old pan or pot
- Wooden or metal spoon for mixing
- Paint (of your choice)

Shakers from metal cans with various seeds:

- Tin cans with their lids
- Seeds of your choice (beans, rice)
- Paint (of your choice)
- Decorative materials (of your choice)

Tin lid bells:

- Tin lids in different sizes
- A nail or sharp object for making a hole in the lid
- Hemp (strips of your choice)
- Cards with pictures of sound sources (appendix no. 1)
- Cards with pictures of instruments (appendix no.2)

6. Duration

1 hour for the creation of the instruments (activity 1), one day for the instruments to dry and an hour for activity.

7. Main activities

Activity 1

Before starting this activity, familiarize learners with the importance of selecting, recycling and reusing waste. Ask them how they can help in that process, what they can do in the

classroom and in their homes. A few days before doing the activity, learners should bring empty cans, paper plates and tin lids.
Open up a discussion with the learners by asking what their favorite musical instruments are. Why are they their favorite? Did they ever play those instruments? What sounds do those instruments make? Would you like to make your own instruments?
Take the learners to the school yard and find a suitable place where they will make the musical instruments. The educator prints cards with pictures of musical instruments in advance. (appendix no. 1).
Divide the learners into teams (depending on the number of learners in the class). Make sure each of the teams has the necessary materials to make the musical instruments.
Let each team representative draw a card with the name of the instrument they are going to make.
1. Paper plate shakers with seeds/beans
The learners take two paper plates and glue them with liquid glue facing each other with the concave part, but leave a small opening to put the seeds or sticks inside. After placing the seeds, they also glue the opening. The shakers thus made can be decorated as desired, and then are put aside to dry.
2. Drums from old pans and spoons
The learners choose an old pan or pot, and then according to their imagination and creativity they can paint them. They can also decorate the wooden or metal spoon as they wish. When the learners finish their instruments they put them aside to dry.
3. Metal can shakers with various seeds
Learners fill tin cans with various seeds of their choice, then close them well with the lid. They decorate them as desired and leave them aside to dry well.
4. Tin lid bells
The learners take one lid each and make a small opening at one end. The educator helps the older learners in the construction, while for the learners from the lower grades, before the beginning of the activity, the educator makes the holes. They pass a hemp or string (optional) through the opening and tie it to one end, while the other end is tied to a wooden branch. They decorate the tin lid according to their imagination. Finally, they leave it aside to dry well.
During the making of the instruments, each learner should wear working gloves and a mask (if necessary).

Activity 2

The educator takes the learners to the schoolyard where they previously made the musical instruments. The learners are divided into teams (the same as in activity 1). Then, each team receives cards with pictures on which sound sources are presented. Each team has to try on their musical instrument to imitate the sound source that is on their card given to them by the educator.

8. Final activities – drawing a conclusion

After they have completed all the activities (activity 1 and activity 2) encourage the learners to express their emotions. Discuss their emotions as they made the musical instruments and listened to the sounds. You can encourage them to play a tune of their choice on the crafted instruments. To make a small concert for their classmates, for other friends or their parents.

9. Reflection

After the learners finish the activities, the educator leads a discussion with them.

- What did you learn about recycling and reusing while creating these instruments?
- Why is it important to recycle materials?
- How did you feel when you played the instrument?
- Which instrument was the most interesting to you?
- Did you enjoy this activity?
- What would you change in the activity?
- Does this activity contribute to environmental protection?

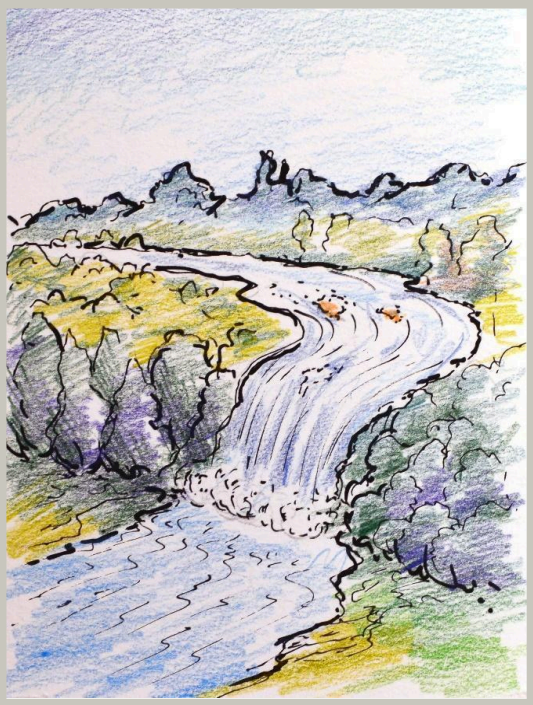
10. Inspiration

Source, private photos Slavica Nestorovska Damjanska

Co-funded by
the European Union

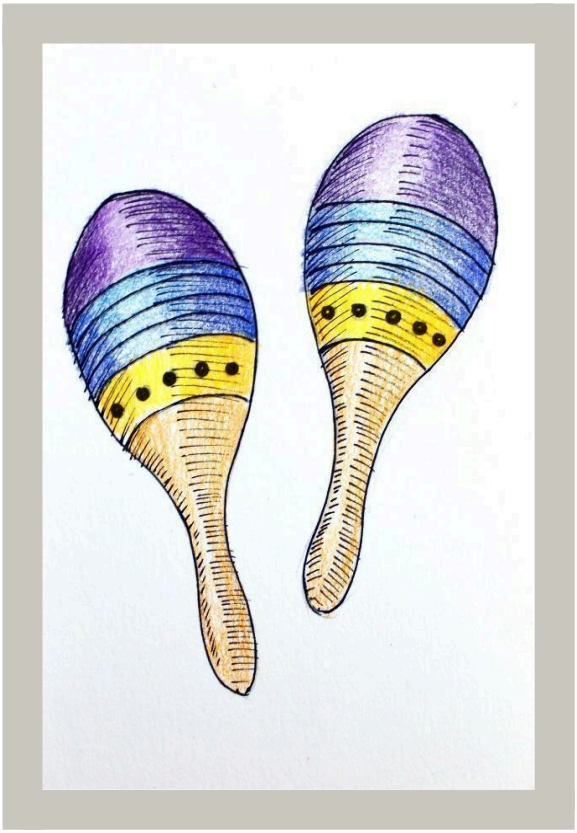
Cards with a picture of sound sources (attachment no. 1)

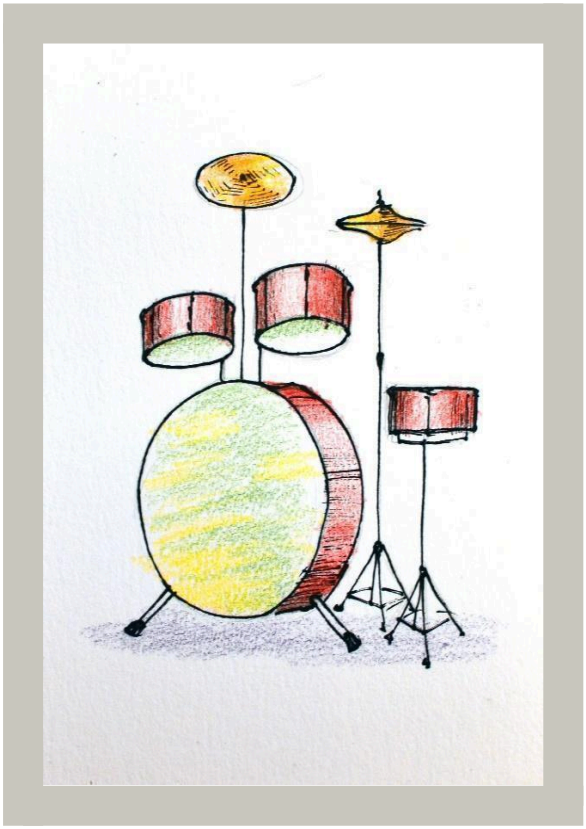
Co-funded by
the European Union

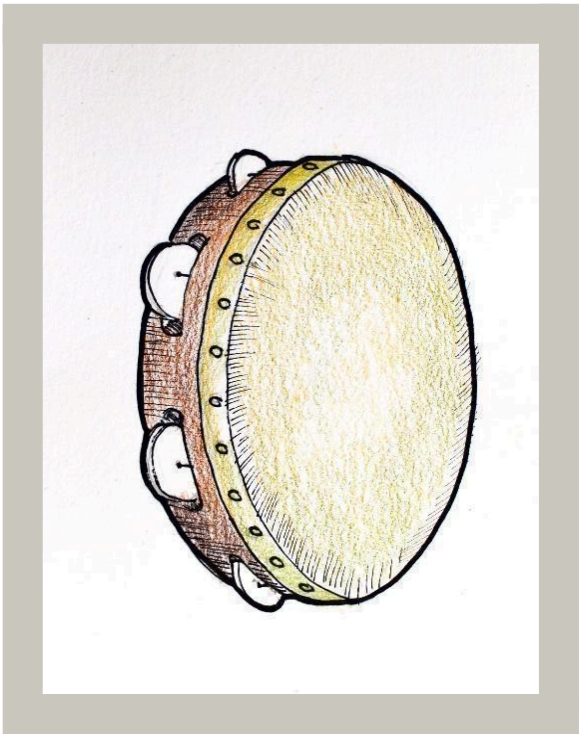


Co-funded by
the European Union

cards with pictures of musical instruments (attachment no. 2)







11.Explanation for children with disabilities: You will find an addition in the next activity 6.18.

6.18 I discover sounds and make instruments from recycled material for children with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.
Provide him with the materials he needs to make drums from old pans and spoons or shakers from metal cans with various seeds (these instruments can be made independently). Explain to him how he should make the instrument and if he needs help encourage the classmates from the group to help him. Finally, together with the other children, let him display his instrument and, of course, try to get a positive comment from his classmates. Together with the others in the final activity, let him imitate the sound of his musical instrument of choice.

6.19 Creation of "Weeds Exhibition"

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Wicked Weed, City for all senses

3. Learning objectives

- Encouraging children's interest in nature and plants/herbs
- Raising learners' awareness about climate change and global warming
- Getting to know the terms biodiversity and weeds
- Identifying the different types of weeds
- Learning about the importance of biodiversity (biological diversity) and ecosystems
- Learning about weeds and their importance for the biodiversity
- Broadening the learners' knowledge of the plant structure
- Developing the learners' research and teamwork skills
- Developing the learners' creative skills
- Enabling learners become self-aware of the environment around them

4. Target group

6 – 14 year-old learners

5. Necessary materials

- Plants (weed)
- Work gloves
- Small garden shovels
- Sheets of paper
- Thick cardboard sheets
- Newsprint paper or used paper sheets
- Safety rounded tip scissors
- Liquid glue
- Self-adhesive tape
- Felt tip pens or crayons of the learners' choice
- A stone or another heavy object
- Computer or smart board (tablet)
- Decorations of the learners' choice (decorative ribbons, jute thread, etc.)

6. Duration

several days depending on the intensity of the plant collection and the age level of learners. (the best period for performing the activity is spring)

7. Main Activities

Activity 1

- First of all, the educator introduces the learners to the topic of "Wicked Weed" and its connection to biodiversity and the protection of planet Earth. The learners could watch a presentation, a video or photos related to the topic.
- The educator prints photos of different types of weeds on sheets of paper. (it'd be best to choose local ones that can be found in the nearby area)
- The learners are divided into several groups and each group gets one printed photo of a type of weed.
- The educator takes the learners to the school yard, or a nearby park so that they find the weeds they saw on the printed photos.
- Before the learners start looking for the plants, the educator points out that they should be very careful when collecting them and it would be good to wear work gloves.
- Each plant is dug up carefully from the ground with small garden shovels (if the learners are too young, or cannot do it by themselves, the educator helps them in the activity).
- They arrange the dug up plants between two (2) sheets of newsprint paper, or used sheets of paper (we are "reuse" conscious), and they stack them one sheet on the top of another, as a book.
- The "book" of plants stacked between sheets of paper is placed somewhere in the classroom.
- The learners put a heavy object (a stone, or something similar) on the top of it and leave it for a few days for the plants to dry.

Activity 2

- In the meantime, while the collected plants are being dried, each group of learners researches about their plant and writes down a short explanation/description of it.
- After the dried plants and their descriptions are ready, the learners arrange the dried plant on the sheet of paper with its description and put self-adhesive tape over it, covering the whole plant.
- Then each sheet is glued to a thick cardboard sheet, leaving a margin of 1-2 cm wide on each side, so as to get each sheet framed like a picture. The learners can decorate the frames of their own choice. On the top of the cardboard they stick a jute string or some other thread.

8. Final activities – drawing a conclusion

• After all the groups have created their framed "weed pictures", the learners with the help of the educator exhibit them in their classroom, or in another place of the school they choose, and make an exhibition of wild plants – weeds, which can be seen by all the learners of the school.
• After completing the activity, the learners discuss what they have learned.
• Each group presents their work to their classmates and educators, but they can also make a presentation for their parents.
• The educator can also organize a debate for the learners from the same school, or for learners from different schools.
• These activities will encourage the children to share what they have learned, develop their communication skills and demonstrate the knowledge they have gained by creating a "weeds exhibition"

9.Reflection – overview of the goals

- How do you feel now that you have created your "exhibition"?
- What was your favorite stage in creating it?
- What did you learn about the different types of weeds and their importance for nature?
- What difficulties did you encounter when creating the "exhibition"?
- Have you noticed that some weeds look alike,but have different names?
- Did you have fun doing this activity?
- Did you find working in teams interesting?
- How did the activity encourage you reflect on nature?
- What would you like to explore, or learn about nature in the future?
- Do you think you could change something to make this activity more interesting in the future?
- These questions can encourage children to think about their experience more thoroughly, raise their awareness of nature and develop their ability for critical thinking.
- In addition, the questions can be the basis for discussion and sharing of stories between children, which can support their social and emotional development.
- Through this activity the learners were encouraged to think and research more about nature and the ecosystem, as well as research about the plants in their environment and how to help protect biodiversity.
- The educators observe the learners throughout this process and adjust the activity according to the experiences gained during its realization.

-

10.Inspiration

What is biodiversity? The term refers to the biological diversity and to the diversity of life in general – whether it is plants, animals, fungi or microorganisms, as well as to the ecosystems they form and the habitats they live in. Biodiversity is essential for human health and well-being, for the economic prosperity, food security and safety, and other areas essential to all people and all human societies. Organisms, ecosystems, and ecological processes supply us with oxygen and clean water, help with carbon cycling and nutrient fixation, allow plants to grow, control pests and diseases, contrubute for the prevention of flooding and the regulation of climate. Biodiversity is extremely important for the people and the health of the ecosystems. Biodiversity enables us to live healthy and happy life. It provides us with a range of food and materials and it contributes to the economy. Without a diversity of pollinators, plants and soil, our supermarkets would have far fewer products. Most medical discoveries which cure diseases and increase lifespan have been made due to research in plant and animal biology and genetics. Whenever a species goes extinct or genetic diversity is lost, we'll never know if research would have created a new vaccine or cure. Biodiversity is also an important part of the ecological services that make life possible on Earth. These include everything from cleaning water and absorbing chemicals, which is done by the wetlands, to providing oxygen for us to breathe—one of the many things plants do for humans.
There are plants that are unfortunately considered harmful, and that is because people are not familiar enough with them. Such plant, considered harmful is the weed. Very often, we characterize the weed as unnecessary, a plant that sprouted in the wrong place, or an enemy that has to be removed, without thinking of its positive effects on the improvement of the agricultural production.
*It is an excellent indicator of the quality of the soil, which shows whether it is poor or rich in nutrients and organic substances, whether it lacks something, what can be grown and where, and how yield can be improved.

*Weed protects the soil - its root protects the soil from erosion under the influence of rain and wind.

*It increases fertility (many types of weed accumulate vital nutrients from the substrate and transfer them to their leaves. As their leaves die, they create fertilizer for the damaged upper part of the soil. The presence of weed may indicate the need for additional treatment of the soil - mostly composting, because every time the vegetables, or whatever else we plant, are harvested and uprooted, part of the nutrients are being extracted from the soil)

*It keeps the soil in good condition. Decayed roots, especially deep ones, add nutrients to the soil. They form channels that allow rain and air to enter the soil, as well as various types of worms and other beneficial soil microorganisms.

*Weeds attract beneficial insects. Its flowers will serve bees and bumblebees, which improve the pollination of vegetables. Weeds support biodiversity and can deter some harmful insects from attacking vegetables. It can also be a haven for some beneficial insects, such as bumblebees.

In addition to the soil, weeds can be very useful in human nutrition, and there are also types of weeds that are used as medicinal herbs.

https://www.youtube.com/watch?reload=9&v=onLYfpNLvds

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.20 I'm learning the parts of plant

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Interaction with nature, City for all senses

3. Learning objectives

- Through research activities to become familiar with the parts of plants and their functions.
- To understand the structure of the plant in a visual and practical way.
- Increasing awareness of plant conservation in nature.
- Developing children' logical thinking and creativity.
- Comprehensive understanding of the functions of plant parts.
- Developing critical thinking.

4. Target group

Children from 6 to 14 years old

5. Necessary materials

- Protective gloves
- Hummer
- Thick sheets of colored paper (optionally colored collage paper or several sheets of block)
- Scissors
- Writing equipment (pencil, eraser)
- Glue (liquid or stick optional)
- Sellotape (adhesive tape)
- Markers or colors of your choice
- Spatula

- The cardboard part of the hand wipes (two pieces or one of wipes and two of toilet paper)
- Cardboard box

6. Duration

90 minutes

7. Main activities

Activity 1

Start the class with a conversation about the different types of plants that you encounter in the environment. Ask them questions about the benefits we get from some plants (For example: from strawberries, we get strawberries that we then eat fresh or make sweets, marmalades, we use mint to prepare tea, etc.). Then through a visual demonstration or pictures, explain to them the parts of the plant and their functions.

Prepare them to explore the plants in the school yard or nearby environment. Before going outside, divide the children into several teams of 4 children each (or according to the educators choice). Have each child bring protective gloves, a spatula, sheets and glue. Once you have prepared, explain to the children that they need to carefully uproot a low-stemmed plant and that they need to examine the parts of the plant in detail.

Find a suitable location, maybe in the school yard. Discuss the functions of each part of the plant. After they have done this research activity, let them glue each part on a leaf, starting with the root, then the stem, on it the leaves and finally the flower, and then stick them in the classroom or in some part of the school, so that the other children can see it. see the research activity.

Activity 2

Prepare materials for work and divide the children into teams of 4 children each (or according to the educators choice). Explain that they are going to make a plant with all its parts.

Have each child make an opening in the middle of the cardboard box in the shape of a circle.

Let them make a 50 cm long tube from thicker paper or hammer. They insert the tube made in this way into the hole and fix it with glue or self-adhesive tape of your choice. One wiper is cut in half (or two cardboard pieces of toilet paper).

On a thick sheet of brown paper, have the children draw a root, cut out the root, and then glue it to one half of the cylindrical part of the hand mop. On a thicker sheet of paper in the color of your choice, let the children draw a flower, cut it out, and then glue it to the second half of the cut cylindrical part of the hand wiper.

On a thick green sheet of paper, children draw a stem and a leaf of a plant, cut out both the stem and the leaf, and then glue them to the remaining cardboard cylinder from the eraser.

The children should arrange the parts prepared in this way correctly on the tube that they inserted into the cardboard box. Have the children make cards with the names of parts of the plant, and then attach them to each part of the plant.

At the end, let each team present their work.

Optionally, collage paper can be used or children can color the parts of the plant themselves. Depending on the age of the children, a different plant than a flower can be chosen.

8. Final activities – making a conclusion

After completing the activities discuss the importance and functions of each part of the plant and encourage children to explain why each part of the plant is important.
Then you can divide them into teams, and each child gets a specific role. For example, let one child be a root and act out how it absorbs water, then let another child act out a stem and how it transfers water to every part of the plant, let a third child be a leaf and act out how it creates food, and the last child a flower and how it gradually develops and attracts pollinators.

9. Reflection overview of the goals

- Did you like the activities?
- What did you learn about the different parts of a plant from the activity?
- How do you think each part of the plant helps the plant grow and develop?
- Which part of the plant was most interesting to you and why?
- Were there any parts of the activity that were difficult or complicated?
- How did you solve those problems?

What did you learn through the activities? Were there parts of the activity that you did not enjoy?

- How did you feel when you finished your model?
- What would you change in the activity to make it better?
- Do you have any suggestions for new ideas or materials that can be used for similar activities in the future?
- What additional information or assistance would you like to have during the activity?
- Would you share what you learned with other children?

How do you think what you have learned can help you in other subjects or activities?

- Did you understand the importance of each part of the plant and their function?

10. Inspiration

Inspiration for the Make a Cardboard Plant Model activity can come from a variety of sources and ideas. Here are some creative ways to get inspired and improve the activity:

- Visit to a Botanical Garden: Organize a visit to a botanical garden or local park. Children can see real plants and identify the different parts, which can inspire them to create their own models.
- Botanical Children's Books: Browse picture books or children's books that focus on plants and their parts. Explanations and illustrations can be a great source of ideas.
- View Art Examples: Explore art projects or creative workshops that use cardboard to make different objects. This can give you new ideas on how to shape and decorate plant parts.
- Plant-Themed Games: Create games that include plant parts. For example, a card game that explores the function of each part.

- Historical Uses of Plants: Explore how different cultures have used plants and what traditional art forms are associated with them. This information can inspire unique designs and techniques.
- Plant Symbolism: Explore the symbolism of different plants and their parts in different cultures. This can help you create projects with depth and meaning.
- Consulting with Educators or Experts: Talk to biology or botany educators who can offer project ideas and advice.
- Encourage children to identify and name the main parts of a plant, including roots, stems, leaves, flowers and fruits.
- Through presentations, enable children to understand the functions of each plant part, including absorption of water and nutrients by roots, transport of water and nutrients by stems, photosynthesis by leaves, reproduction by flowers, and seed dispersal by fruits.
- Encourage children to explain how different parts of a plant are adapted to their specific functions and environments, such as the presence of root hairs for increased surface area or the shape of leaves to maximize absorption of sunlight.
- Encourage children to apply knowledge in everyday life.

https://www.instagram.com/reel/C5DdNYdMPDx/?igsh=MTZsNTAweWlvNDFidA==

11.Explanation for children with disabilities

encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.21 I'm learning the parts of plant for children with disabilities

In case you have children with disabilities in your class, you can include them in the implementation of the activities.
Encourage the children to describe a plant of their choice by asking questions. Go out into the schoolyard, and with your help, carefully uproot a low-stemmed plant. After uprooting it out, encourage the children to describe it. Explain to each child separately what each part of the plant is for. Encourage the other children in the class to help them stick the parts on the sheet, but also in the second activity. (see activity 6.20) Finally, include them in a group with the children in the dramatization.

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6.22 Researching the effects of wicked weed on plants

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Wicked weed (Researching the effects of wicked weed on plants)

3. Learning objectives

Developing research skills for learners to investigate and understand the effects of weeds on plants

- understanding the importance of weed control in agriculture and sustainable ecosystem management
- developing discussion and debating skills
- analyzing, synthesizing and collecting data
- developing problem solving skills
- gaining practical experience so the learners can apply their knowledge and skills in real situations, such as working in the garden
- learning through research
- raising awareness about the impact of weeds on plants and the need for sustainable land management
- increasing learners' interest in natural sciences and sustainable agriculture.
- motivating learners to be active protectors of nature and take responsibility for the preservation of biological diversity.

4. Target group

6 – 14 year-old learners

5. Necessary materials

- two planting pots
- potting soil
- plant seeds (of your choice)
- weeds
- notebook
- writing utensils (pencil, markers, etc.)

6. Duration

60 min. for preparation of the plants and few weeks for observation

7. Main Activities

Activity 1

Show learners a visual presentation or pictures of different types of weeds. Explain the term weed. Through questions, encourage them to tell you if they have encountered these types of plants anywhere and where. Discuss the harmful effects of weeds on plants, but also the positive benefits for the environment and biodiversity. Then take them to the school yard, or to a nearby park to explore different types of weeds. While walking around the yard, let the learners touch the wild plants, analyze them carefully and encourage them to discuss with each other.

After they have finished observing, have the learners draw the wild plant in their notebooks and describe it. Then have them read/share the descriptions with their classmates.

Activity 2

After you have finished observing the different types of weeds, conduct an experiment to investigate the effects of weeds on cultivated plants (those planted by humans).

Divide the learners into two groups. Provide each group with a container/planting pot, seeds and potting soil.

Show the learners how to fill the pots with soil and how to plant the seeds or the small plants. Explain proper care and watering techniques to them.

The first group puts soil in the pot and plants seeds. The learners mark which seed they planted in the container by putting a label on it. Let them be creative in making their label. (e.g. drawing the plant they planted). This pot will be the control pot.

The second group puts soil, seeds and weeds in the container. Let them be creative in making their label. (e.g. drawing the plant they planted). This pot will be the experimental pot.

The learners put the planted pots in a place with enough light (both pots should receive the same amount of light). Also, learners should water and care for their plants regularly. Point out to them that they should be careful to put the same amount of water in both containers.

Learners keep a diary of the daily changes that occur in the two pots and record the changes in their notebooks (learners from the lower grades who are not literate record the results through drawings).

8. Final activities – drawing a conclusion

After a few weeks the plants will be grown. Learners will be able to spot the differences in the two pots.

After completing the experiment, learners can compare the growth and development of the plants in the two pots. They will notice that the plant where there were no weeds has grown, but the one where there are weeds has a harder time growing.

Have a discussion with the learners about: Do weeds affect plant growth? In which group does the plant grow better?
Encourage them to share their thinking as to why this is so?
Then, the learners share their experience with other learners from the school.
Finally, learners can play a role-playing game. Divide the learners into two groups. Have one group pretend to be a plant and the other group to pretend to be a weed.

9. Reflection – overview of the goals

- Did you like the activities?
- What did you learn from the experiment?
- Do you think that weeds only have a harmful effect?
- What are the positive and negative impacts of weeds?
- Why do farmers pull weeds from plants?
- If there are no weeds, will there be natural reforestation in case of fires?
- How do weeds affect biodiversity and the ecosystem?

10. Inspiration

Weeds can have a negative impact on plants in a number of ways, but they also play a significant role in biodiversity and are an important part of the ecosystems.

- Weeds compete with cultivated plants for light, water and nutrients. When weeds are too close to the plants, they can suffocate them, limiting their access to light and water.
- Weeds can be carriers of diseases and pests that can be transmitted to cultivated plants, resulting in disease and damage to the plant.
- When weeds are present in large quantities, they can reduce the yield and quality of cultivated plants.
- Weeds can spread rapidly if not controlled, which can lead to land management problems and result in loss of plant capacity and economic losses.
- To protect plants from weeds, it is important to apply weed control methods such as mechanical control (weeding), application of herbicides and application of integrated weed management methods. These methods can help reduce the impact of weeds on plants and protect their growth and development.
- Many species of animals, such as insects, birds and small animals, feed on weeds. Weeds can be a food source for a variety of animal species, including beetle larvae, birds that feed on weed seeds, and animals that use weeds as pasture.
- Weeds create different habitats for different types of animals. Some types of weeds can create suitable nesting conditions or protection for animals, while others can be useful as cover or shelter.
- Weeds have an important role in protecting land from erosion and degradation. The roots and upper structure of weeds preserve topsoil and retain moisture, which prevents soil erosion and land degradation.
- Weeds can have an impact on plants in an ecosystem, such as increasing competition for resources, or in certain species have a positive impact, such as weeds attracting pollinators.
- Weeds are part of the diversity of plants in the ecosystem and contribute to increasing biodiversity.

- Different types of weeds are habitats for different animal species and maintain a high level of diversity.

Although weeds are sometimes considered a problem in agriculture and horticulture, they play an important role in the ecosystem and are necessary to maintain healthy ecosystems and species richness.

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.23 Nature scavenger hunt

1. Type of activity

Outdoor activity

2. Topic

Interacting with nature

3. Learning objectives

- Encouraging learners to explore their environment and discover new things.
- Increasing learners' awareness for protection of their surroundings and the environment
- Developing teamwork skills and cooperation
- Developing learners' creativity and imagination
- Developing learners' critical thinking
- Improving learners' knowledge and skills for interacting with different aspects of nature

4. Target group

6-14 year-old learners

5.Materials needed

- An empty egg carton
- Printed sheet with objects of nature that should be found (appendix no. 1)
- Writing utensils (pencil, eraser, etc.)
- Felt-tip pens or other type of colour pencils (of your choice)
- Notebook or white sheets of paper (of your choice)
- Round tip safety scissors
- Liquid or stick glue (of your choice)
- A magnifying glass

6. Duration

60 to 120 minutes depending on the age of the children and the goals you have set for them (not counting the time to get to the place you have chosen to perform the activity).

7. Main Activities

Activity 1

The educator starts discussing with the learners what they see when looking out the classroom window. What is the landscape like? What's there in the school yard? What can they encounter in the nearby environment or in the nearby park? What is the landscape like there?

At the beginning of the activity, the educator divides the learners into several groups/teams depending on the number of learners. Each group receives an empty egg carton and a sheet of paper with pictures of objects they will have to find in nature. The list of objects can be different depending on the age of the learners (you can choose a topic that is currently studied or the template given in appendix no. 1). The pictures of the objects from the printed sheet should be cut out by the learners and glued to the lid of the empty cardboard egg box

Activity 2

The educator explains the activity to the learners in detail. Then, he/she takes the learners to the school yard, the nearby park or a place of their choice to carry out the activity. Each team brings with them the cardboard box with assignments, writing utensils, felt-tip pens, a notebook or white sheets.

The teams have the task of finding the objects in nature and placing them in the cardboard box in the corresponding gap, under the picture that they previously glued on the lid of the egg carton.

To make the scavenger hunt more challenging give the learners a time limit for completing the task.

8. Final activities – drawing a conclusion

After the activity is over, all groups/teams of learners gather and share information about what objects they found, explaining why they think they are interesting or important. They observe the found objects from nature with a magnifying glass, and make notes from the observation in their notebooks. Optionally, they can draw the objects or the landscape they can see in nature.

9. Reflection – overview of the goals

Discuss with the learners:

- Did you manage to find all the objects from the list?
- Which objects were most interesting for you and why?
- What did you learn from this activity?
- What was the most difficult part of the activity for you?

- Would you change anything in this activity?
- Would you like to explore nature again?
- Ask the learners to do a self-assessment for the activity. Do they think they performed the tasks well? What could they do better next time?

11.Explanation for children with disabilities : You will find an addition in the next activity 6.24.

6.24 Nature scavenger hunt for kids with disabilities

If there is a child with special educational needs in your class, you can include him in the implementation of the activities.

Provide the materials to carry out the activity. Put the child in one of the groups, then explain to him what he has to do during the lesson. Let him take out a card with a picture of an object and stick it on the lid of the egg carton. After you go outside, explain to him that he has to find those objects that are in the picture from the cover.

6.25 Researching the effects of soil pollution on plants

1. Type of activity

Classroom activity and Indoor activity

2. Topic

Interacting with nature(Researching the effects of soil pollution on plants)

3. Learning objectives

- Developing skills for learning through research and experiments
- Learning about the importance of soil protection and biodiversity
- Understanding the impact of soil pollution on plant health and growth
- Developing problem solving skills
- Developing critical thinking
- Developing skills to observe
- Raising awareness about environmental pollution and how it has a direct impact on clean and healthy soil
- Encouraging teamwork
- Raising learners' awareness of their responsibility in maintaining a healthy and clean environment
- Developing logical thinking
- Encouraging learners to share their knowledge with the community

4. Target group

6 – 14 year-old learners

5. Necessary materials

- Four planting pots
- Planting soil
- Seeds (vegetable seeds of your choice)
- Clean water
- Oil (vegetable or motor oil)
- Sodium bicarbonate
- Table salt
- Magnifying glass
- Notebook
- Writing utensils
- Markers or colour pens of your choice

6.Duration

60 min.

7. Main activities

Explain to the learners what soil pollution is and how it can affect plant health and growth, as well as ecosystems in general. Discuss the different types of pollutants such as heavy metals, chemicals, pesticides and others. Show them photos, presentation, links about different pollutants and develop a discussion about it.
https://www.youtube.com/watch?v=OqHp03RRTDs
https://www.youtube.com/watch?v=ODni_Bey154
Encourage learners to share their thoughts about the measures they could take to protect the environment.
Then prepare the learners for an experiment for researching the effects of soil pollution on plants by placing them in different types of contaminated and uncontaminated soil and observing their growth and development. Prepare the materials needed for the activity. Carefully explain the planting process to the learners. Show the learners how to fill the pots with potting soil and how to plant the seeds.
Divide the learners into (4) four groups.
First, each group fills its container/pot with potting soil.
The first group sows the seeds in their container and puts clean water for watering (this will be the control plant).
The second group sows the seeds in their container/pot, but adds oil to the potting soil beforehand.
The third group sows the seeds in their container/pot, but adds sodium bicarbonate to the potting soil beforehand.

The fourth group sows the seeds in their container/pot, but adds salt to the potting soil beforehand.
Remind the children to nurture the plants equally, planted in all the different types of soil. Instruct them to provide consistent, uniform conditions for each group of plants and make sure they monitor the results carefully. Learners monitor the growth and development of the plants over a period of time.
After completing the activity, it takes several weeks to see the results of the experiment.

8. Final activities – drawing a conclusion

After the plants have sprouted, provide the learners with a magnifying glass so they can see the differences between the plant planted in clean soil and the other plants planted in contaminated soil. Let them write down the differences in a notebook (learners from lower grades can record the results by drawing). Then discuss the results from the experiment, and conclude that soil pollution affects plants. Encourage learners to think of possible ways to solve the problem.
Some of the learners can make short presentations where they will share their findings and conclusions. These presentations can include illustrations, photos, graphs depending on the creativity of the children. Support children to do creative projects related to soil pollution and environmental protection. These projects can include making posters, collages, dramatizations, etc.
Motivate the learners to share their conclusions and knowledge with other learners, educators and parents, through presentations, posters, exhibitions and in other creative ways.

9. Reflection, overview of the goals

After completing the activities, lead a discussion with the learners.

- What did you conclude through this experimental activity?
- Did you like the activity?
- How do different pollutants affect the physiology and development of the plants?
- How do plants react to soil pollution?
- Do you think that only plants suffer from pollution?
- What would you do to reduce environmental pollution?
- How can you apply what you have learned in your everyday life?

10. Inspiration

Soil pollution is a serious problem that can have negative consequences on the health of the human population, the environment and the entire ecosystem in general. Here are some aspects and consequences of soil pollution:
The use of chemicals such as pesticides, insecticides and fertilizers can lead to soil pollution with various heavy metals and chemicals that can be toxic to plants, animals and humans.
The lack of sustainable agricultural practices can lead to soil erosion, resulting in loss of soil fertility and quality.
Irresponsible maintenance and management of industrial waste can lead to leaching of hazardous chemicals and heavy metals into the soil. This can have far-reaching consequences for the environment and the health of the local population.

Soil pollution can lead to the loss of biodiversity, as the possible toxins of other microorganisms can destroy microorganisms and other living organisms that are crucial for the soil and for the plants. Heavy metals and chemicals present in polluted soil can be absorbed by plants and end up in the food we consume. This can put people at risk of various health problems, including poisoning and cancer.
Contaminated soil can have negative consequences on agriculture, including crop reduction, loss of product quality, and greater consumption of resources for soil treatment and protection.
To reduce soil pollution, it is necessary to apply sustainable agricultural practices, implement effective waste management measures and establish strict regulations to control pollutants. In addition, educating learners from an early age and raising public awareness of the importance of soil protection are key to the fight against pollution.

11.Explanation for children with disabilities

Encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.

6.26 Greenhouse gasses - creating candy models (gummy or jelly candy)

1. Type of activity

Classroom activity and Outdoor activity

2. Topic

Interacting with nature (Greenhouse gasses - creating candy models (gummy or jelly candy)

3. Learning objectives

- Raising awareness among learners about the impact of climate change on people's lives and on our planet
- Developing creative skills
- Getting to know the terms greenhouse effect, greenhouse gases and global warming
- Better understanding of the scientific principles of the greenhouse effect, including the role of greenhouse gases in holding heat in the Earth's atmosphere.
- Developing the ability to analyze data. Linking cause and effect and assessing the implications of increasing greenhouse gas emissions on ecosystems, weather patterns, and human societies.
- Raising awareness for environmental responsibility

4. Target group

10 – 14 year-old learners

5. Necessary materials

- Gummy or jelly candies (by your choice) – if you don't have any, you can use plasticine
- Toothpicks (wooden sticks optional)
- Working Gloves
- Smartphone or camera
- Hard paper coloured sheets or larger sheets (by your choice)
- White paper sheets
- Writing utensils (of your choice)
- Colouring supplies of your choice

6.Duration

60 minutes

7. Main activities

Before starting this activity introduce the learners to the topic of the greenhouse effect and greenhouse gases. Greenhouse gases are gases in the Earth's atmosphere that hold heat. The increase in greenhouse gases caused by human activity is responsible for the greenhouse effect and global warming.
Ask the learners to try to imagine what it feels like to go into a greenhouse, or sit in a room with many (closed) windows on a hot day. It feels very hot. This is because sunlight passes through the windows creating heat that remains in the space, as there is no air circulation. The same thing happens in our atmosphere. Sunlight passes through and releases heat that remains in the atmosphere. Greenhouse gases themselves are not harmful because without them our planet would be too cold for life to exist on it. But humans are adding too many greenhouse gases to the atmosphere by burning fossil fuels, as well as many other factors that are the result of modern living today. Even a small increase in temperature can have a devastating effect on our planet.

Greenhouse gases are mainly the following
Water vapor
Carbon dioxide
The methane
Ozone
Nitric oxide
Chlorofluorocarbons

Before starting the experiment, ask the learners to follow your instructions carefully.
Divide the learners into pairs. Assign each pair the task of making a model of a greenhouse gas. Before they start making their models of greenhouse gases out of candy or plasticine,

first decide together with the learners which colour will represent which chemical element (depending on the colours of the gummy candy or plasticine).

Chemical elements

C- Carbon
N – Nitrogen
Cl- Chlorine
O – Oxygen
F – Fluorine
H – Hydrogen

Enjoy creating your own greenhouse gas models!
Learners take gummy candies or plasticine balls and prick them on toothpicks or wooden sticks. They form greenhouse gases from chemical compounds (gum candies or plasticine).

METHANE MODEL
Methane is the gas most often associated with cows. The chemical formula is CH_4.
This compound is 1 carbon atom surrounded by 4 hydrogen atoms. Methane is released from livestock, from landfills, and when coal, oil, and natural gas are extracted from the Earth.

OZONE MODEL
Ozone is a gas composed of three oxygen atoms. It has a strong smell. The oxygen we breathe has two oxygen atoms and is colorless or odorless. The ozone layer blocks radiation from the sun. Good ozone occurs naturally in the upper stratosphere (the layer of space 6-30 miles above the earth's surface), and is formed when UV light strikes oxygen molecules, splitting them into two oxygen atoms. When an O atom combines with an O_2 molecule, ozone is formed.

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CHLOROFLUOROCARBON (CFCS) MODEL

CFCs consist of chlorine, fluorine, carbon and hydrogen. Chlorofluorocarbons are greenhouse gases responsible for damaging the ozone layer. They are man-made and not found in nature. CFCs are found in aerosols, refrigerators, and foam (polystyrene foam) products. They break down ozone gas, which severely depletes the ozone layer, reducing its ability to protect us from the sun's harmful rays. CFCs have been banned for use in developed countries since 2000, but they are very stable molecules that can last up to 100 year-old learners! There is some evidence that the ozone layer has started to repair thanks to this ban, which is great news and shows how fast and effective action can really make a difference.

The CFC molecule below contains 1 carbon molecule located in the center, surrounded by 3 chlorine molecules and 1 fluorine molecule.

NITROUS OXIDE MODEL

Nitric oxide N2O is a natural part of the nitrogen cycle. Too much nitrous oxide (from burning fossil fuels) can lead to smog and acid rain.

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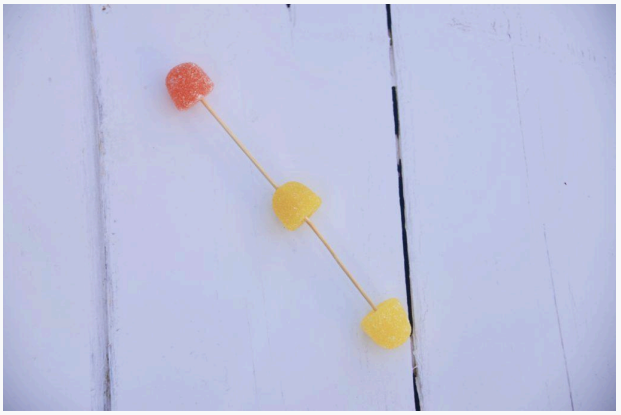
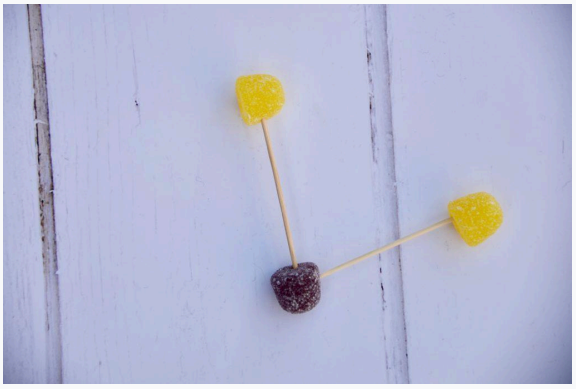


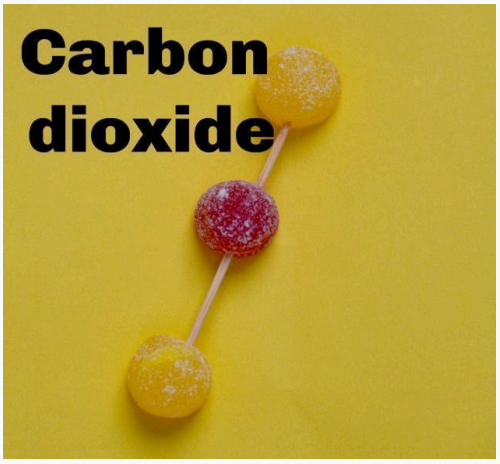
WATER VAPOR MODEL

Water vapor is water (H2O) in gaseous form. It forms clouds and returns to Earth as rain. It may surprise learners that water vapor is the largest contributor to Earth's greenhouse effect, but it is directly related to Earth's temperature. The increase in temperature (global warming) has led to an increase in water vapor in the atmosphere.



CARBON DIOXIDE MODEL

Carbon dioxide is probably the most well-known of the greenhouse gases. CO2 is released whenever fossil fuels are burned. Carbon-fired power plants and transport are the main causes of the increase in CO2.



8. Final activities – drawing a conclusion

After the learners have made the greenhouse gas models you can lead a discussion focusing on the following questions: HOW CAN WE REDUCE GLOBAL WARMING? HOW TO REDUCE GREENHOUSE GASES? They can take pictures of the models and make a poster for the classroom. Then they can treat themselves to the sweet models of greenhouse gases they have made.

The learners can also make a poster with some tips:

- To slow down climate change, we need to drastically reduce the amount of carbon dioxide and other greenhouse gases released into the air.
- Use electric or hybrid cars.
- Make restrictions on the excessive use of heating and air conditioning.
- Recycle and reuse as much as possible.
- Buy energy efficient products and switch off electrical appliances when not in use.
- Walk and cycle more instead of using your car.
- Consume less meat. Grow your own food and don't waste it!
- Fight for renewable energy and change!

9. Reflection

After finishing the activities, the educator initiates a discussion with the learners.

- What did you learn through these activities?
- Did you find the activities interesting?
- Would you change anything in the activities?
- How did you feel while doing the activities?
- Did anything surprise you while making or observing your greenhouse gas models? If so, what was it and why do you think it surprised you?
- Did the activities help you understand the essence of greenhouse gases?

10. Inspiration

https://spaceplace.nasa.gov/gumdrops/en/

11. Explanation for children with disabilities

encourage children with developmental disabilities to participate in the activity, each according to their abilities. Encourage other children to help them and do the activity together.