

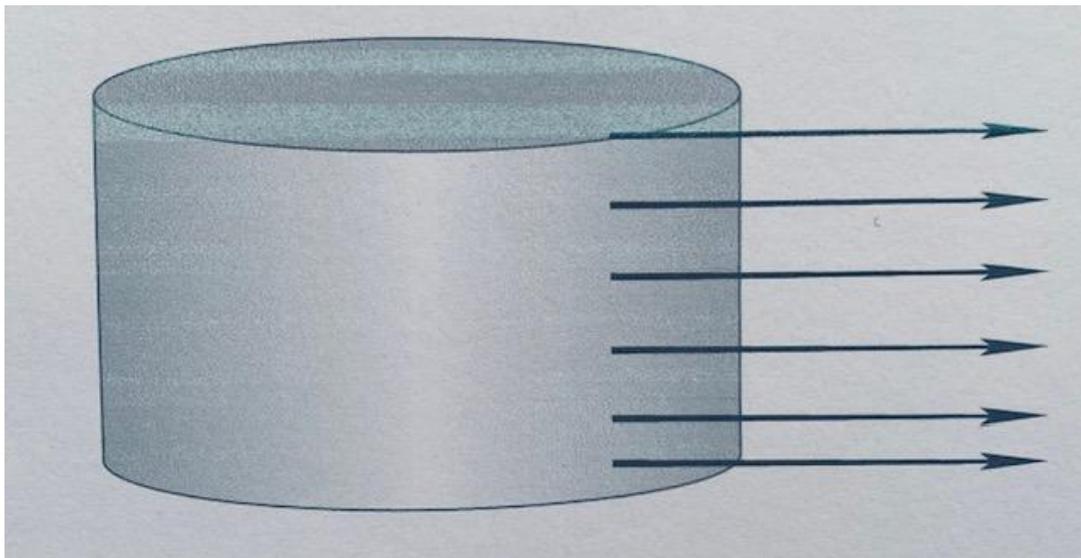
Composter and useful earthworms

1	<p>Overall aims:</p> <ul style="list-style-type: none"> • Defining the terms: bio-waste, composter, compost • Shaping the ability to distinguish bio-waste generated at home and in the garden, • Determining the possibilities of using waste for the production of fertilizer, • Indicating the places of compost formation • Learning about the features of the composter • Describing the layered structure of the composter • Developing entrepreneurship • Shaping pro-ecological behaviors • Strengthening empathic attitudes
2	<p>Vocabulary - keywords earthworm, bio-waste, composter, compost.</p>
3	<p>Sustainable abilities developed</p> <ul style="list-style-type: none"> • Strategic competency • Self-awareness
4	<p>Pillars of sustainability included</p> <ul style="list-style-type: none"> • socio-cultural • economical
5	<p>STEAM domains S, T, E, A</p>
6	<p>Teaching methodologies/activity outline</p> <p>1. "Bio-waste in the home and garden" - the teacher informs about the sources of waste that arise in the household. Household waste is generated during the preparation of</p>



meals. Most often they go to the garbage can, but in large part they could be the basis for the production of fertilizer (compost): vegetable and fruit peelings, food scraps, egg shells, coffee and tea grounds, nut shells, dairy product residues, dry bread. The house also produces waste that is not related to food production, but can also be used for composting: paper (after being soaked in water), sawdust, withered cut flowers, remains of potted flowers, old soil for flowers. The composter must not contain waste that is additionally treated with paints or covered with a plastic film. Household waste that is not suitable for composting is: glass, metals, plastics, used batteries, various chemicals, soot, construction debris. Garden waste generated on the plot can also be composted, but the decomposition process will take much longer than the decomposition of food scraps. It is therefore advisable to mix kitchen and garden waste. The following are suitable for creating fertilizer: inedible parts of harvested fruits and vegetables, leaves, mowed grass, branches, straw, hay, bark. We can support the composting process by adding last year's compost and the collected earthworms (this will accelerate the conversion of waste into fertilizer).

2. **"What does a composter look like?"** - the teacher presents the features of the composter, illustrating the statement with pictures of composters in the gardens. On the board illustrating the layered structure of the interior of the composter, the children describe the individual levels by making drawings.



3. **„Outdoor activity“** - choosing the right location for placing a wooden box (a quiet place, sheltered from the wind and in partial shade). At the bottom of the composter, children place broken twigs (this will create a drainage layer). They then lay out peat, garden soil or last year's compost to create a layer that absorbs the minerals washed away by the water from the top layers of the compost that forms. Then they lay down successive layers of organic waste, which they shuffle with soil. Then they add earthworms, which will support the composting process (by walking underground, they dig corridors by aerating the ground; they eat organic debris and enrich the



compost with their excrement).

Additional activities - according to the teacher's choice:

4. **"What are we going to do with the compost obtained?"** - brainstorming ideas
(Suggestion: maybe we can take responsibility for selecting bio-waste and adding it to the composter - together in our preschool group)
5. **Why do we call the earthworm „the gardener's helper?"** - listening to a fairy tale about Helena with the use of the Kamishibai theater
6. **Designing the "Garden Earthworm Club"**, where Helena and her friends will be able to rest after hard work
"What are earthworms talking about?" - drama games in groups

7 Expected learning outcomes

The child will be able to:

- explain the concepts of: bio-waste, composter, compost, fertilizer
- indicate which waste can be placed in the composter
- choose a place where the composter can be set up in a preschool garden
- explain how the resulting compost can be used
- take actions to reduce the amount of waste in landfills (in preschool)
- express tolerance to others

8 Assessment

Self-reflection activity



Yes



I am not sure



No

The child indicates the answer to the following sentences:

- I know what bio-waste is
- I know which waste can be put in the composter
- I can set up a composter
- I know why the earthworm is the gardener's helper



9	<p>Equipment and materials to be used in learning unit (tools, ingredients etc)</p> <p>A board with the names and pictures of various household waste (or examples of waste such, as: paper, used tissues, vegetable and fruit peelings, dry flowers, leaves, old bread, plastic bottle, glass bottle, battery etc.) Illustrations of various types of composters, a board with a layered composter structure, a wooden box, twigs, peat, garden soil or last year's compost, organic waste, earthworms, Kamishibai theater, art supplies.</p>
10	<p>Kind of setting - lab, kitchen, outdoor etc.</p> <p>Preschool garden, classroom</p>
11	<p>References - source:</p> <p>Story of an earthworm https://narzeczdzieci.pl/dla-rodzicow/bajki-terapeutyczne/bajka-o-dzdzwonicy-helenie/</p>

Story

In a beautiful valley, just below an old forest, Grandma Janina lived. She was a true friend of animals. Cows, sheep and goats grazed around her tiny house. She also had a small flock of hens and ducks. Behind the house was a garden, which was teeming with little creatures. Among them was a family of earthworms, which had lived in Grandma Janina's garden for many generations. And it is about these little creatures that this story will be told.

Among them lived the earthworm Helena. However, she was no ordinary earthworm - she was half the length of the others. This had to do with an unpleasant event from her childhood, when Helena went for a lonely walk. Since earthworms are extremely small and defenseless creatures, Helena crawled around unnoticed by anyone. With time, this became quite a nuisance, because when she wanted to talk to some larger animal such as a horse or even a cat - no one could see her in the grass. This was also the case this time.

Unhappily, Helen on her way met a cow called Mućka returning from the pasture, who, thoughtful as ever, slowly rolled towards Helen. As the cow passed, she stepped on an earthworm. As you may already know, earthworms have an unusual characteristic. If they somehow lose a piece of their long body, they can live on. From then on, Helen was half the length of other earthworms. It was not easy for her because of this. The other earthworms laughed at her and teased her. She felt terribly sorry for herself. To make matters worse, when she looked in the mirror, she did not like herself at all.

- I'm ugly and messed up - she thought of herself. She wanted terribly to look like other alluring earthworms. When she was still going to school, her classmates laughed at her looks in corners.

- Sprout! Pędrak! - They preferred after her. And although her parents loved her very much and told her that looks were not the most important thing, that she was beautiful just a tad shorter, making her special, she decided that as soon as she finished school she would go underground and no one would



ever laugh at her again. This is what she did. As soon as she received her certificate, she went underground. There she spent months digging in the ground and making tunnels. From time to time she would meet her mole friend Alfred. Since moles can hardly see anything, it didn't matter to Alfred that Helena was shorter than the other earthworms. Helena was busily digging new tunnels all day long. She was getting better and better at it every day. The tunnels were nice, spacious and nice to live in. However, life underground was not easy. She often felt lonely, but what she missed most was the sight of the sun. One day, tempted by the glare of a ray falling into one of the excavated tunnels, she emerged from underground to see the sun she had longed for. She timidly looked out of her burrow. It was pleasant and warm outside.

- 'I'll warm up a bit and then I'll go," she decided. She enjoyed the sunshine, the light breeze and all the sounds of the meadow, which she had not heard for a long time. In the distance, a dog was barking, long-unfolded leaves were rustling, larks were chirping on the surrounding trees in the orchard. Helen felt an overwhelming longing for what she had put down to leave behind by going underground. It seemed to her that the garden was more beautiful than usual. For a moment she regretted her decision, but immediately remembered the faces of the other earthworms laughing at her. Though with a longing in her heart with, she nevertheless decided to go back underground before anyone noticed her. She was already walking back into her burrow when she heard someone call her name.

- Helena, Helena wait!!!

- Damn it! Someone saw me!!!-she panicked.

- Helena, it's Hermenegilda! - Helena couldn't believe her eyes. Hermenegilda was one of those earthworms who used to tease her the most! Reluctantly, she turned towards her and... stunned with surprise. A huge, fat, sweaty earthworm was slowly rolling towards her. She in no way resembled the limber girl from her school days. Helena felt that she had nothing to fear anymore. Hermenegilda stopped to take a breath.

- An easy morsel for a hungry hen, Helena thought in her spirit. They looked at each other for a while with interest.

- I haven't seen you for a long time," Hermenegilda began. Helena was not surprised. After all, all the inhabitants of Grandma Janina's garden knew that she had decided to hide from the world by digging tunnels deep underground.

- Everyone is talking about you," Hermenegilda continued. The last thing Helena wanted was to be talked about again. So she said goodbye to her old friend and turned towards the mink.

- Helena wait! - shouted the other woman. - You made all the inhabitants of grandma's garden live like in paradise - Helena looked at her surprised. - Look around you - Hermenegilda didn't give up - can you see the beautiful plants around us? Look how beautifully everything has bloomed. You have made the garden grow all sorts of flowers that never wanted to grow there. There are so many of them that the bees finally have somewhere to gather pollen from, and there is never a shortage of honey. The surrounding cows, horses, goats and sheep have so much grass to eat that Grandma Janina no longer has to look for a new place to graze her cattle. Even old tortoise Leopold, who can barely walk because his joints hurt, has whole clumps of milkweed leaves under his nose for breakfast. And Grandma Janina makes huge bouquets of flowers every day and doesn't worry that one day she'll pull



them all out, because new ones grow every day. And the vegetable garden has grown such a huge pumpkin that no one has ever seen before! It will make preserves for the whole year! Carrots, parsley, cucumbers and other vegetables are growing so fast that people can't keep up with picking them. Everyone is happy because no one is worried about whether there will be food in the winter. There is already enough to last a whole year! Grandma Janina's garden, orchard and vegetable garden have never looked so beautiful. It's all thanks to you, Helena!!! - Helena listened in disbelief. After all, she'd been underground all year and had been busily digging kilometers of tunnels, so how had she contributed to the lushness of the vegetation and the fertility of the area, if she hadn't once come out of the ground?

- Don't be surprised, dear friend," said another earthworm, who had hitherto hidden behind a sunflower leaf and decided to come out of hiding. - It's all true, Helena," she continued, "the earth is so fertile thanks to you. Thousands of your tunnels have made it plump and oxygenated like never before. That's why everything around us grows so beautifully. You have proved that we earthworms are useful and that you, although shorter, are the most hardworking of us all. We want to thank you and apologize for all the unpleasantness you have experienced. Various animals gathered around Helena and gazed at her with gratitude.

From then on, Helena was the happiest earthworm in the neighborhood. At last, no one teased her, the other animals treated her with respect and appreciation, and her schoolmates came to her for a little advice. She soon founded the "Garden Earthworm Club", where she taught her fellows the art of tunnelling. Grandma Janina's garden always looked stunning, and although she herself did not know whose fault it was, she felt very happy. Even Hermenegilda was grateful to Helena - by learning to work underground from her, she had lost half her weight, and looked like her old self again. She treated Helena as her best friend and remembered not to tease the other creatures. Although distrustful at first, Helena forgave her friends for all their annoyances. She finally felt like a member of a big family and was never lonely again - she had many friends everywhere.

