# VERMICOMPOSTING IN THE BUCKET

| Title | Vermicomposting in the bucket |
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| **Skills** | - creativity and craftsmanship;<br>- social and civic competences;<br>- communication and organisation. |
| **Topics** | - responsible consumption;<br>- intergenerational dialogue;<br>- education for sustainable development;<br>- sustainable urbanisation;<br>- Separation of waste at source<br>- Use of organic waste<br>- Production of organic fertilisers |
| **Target Groups** | - boys and girls (3-11 years);<br>- people with special needs;<br>- young people (12-25 years); |
| **Brief description** | One of the most important elements of organic farming is organic fertilisers. They improve the soil and promote plant development. There are various ways to produce organic fertilisers, e.g. compost bins, fermented fertilisers, digestate bales and others. In the field, plant residues and animal manure are the main raw materials for fertiliser production.<br>In the city, the main raw materials available are organic waste from the kitchen and pruning waste, leaves from green areas and vegetable waste from garden crops.<br><br>The Compost Worm is an excellent processor of organic matter, especially for processing kitchen waste, animal manure and fresh vegetable waste from the garden. The resulting worm compost, or vermicompost, is excellent for soil and plants. On the one hand, the concentration of nutrients increases significantly, and on the other hand, the most important thing is that it has a high concentration of microorganisms that help in various plant life processes |

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| | (nutrition, protection from diseases and pests, stimulation of plant growth).<br><br>There are various models for producing vermicompost: Beds, bins, commercial composters, bins, etc.<br>The small cube model we want to realise in this exercise has several advantages: it is easy and inexpensive, it can also be used in small spaces such as balconies, terraces or patios. The disadvantage is that, being small, the capacity to process waste is limited.<br>If desired, there are some wooden models or plastic boxes that can be purchased ready-made.<br><br>The model consists of 2 buckets, one placed inside the other. The lower one collects the leachate and is equipped with a tap to extract the liquids, while the upper one has holes at the base (so that the leachate can drain away) where the organic waste and earthworms are placed. The waste is added as the earthworms consume it. |
| **Objectives** | • Learn about the Compost Worm, its feeding, reproduction and care.<br>• Learn a way to use organic kitchen waste and turn it into fertiliser for your garden, vegetable garden or plants in general.<br>• Preventing organic waste from ending up in landfills, where it becomes an environmental problem.<br>• Construction and operation of a vermicomposting plant in the village. |
| **Materials** | **For the construction of the vermicomposting system:**<br><br>• 2 20-litre plastic paint buckets<br>• 1 plastic watering tap or valve + saddle, or other tap.<br>• 40 x 40 cm gauze<br>• drill and 1.5 inch drill bit or other for drilling holes in plastic<br><br>**Other materials** |

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| | • Organic kitchen waste (no citrus fruits, animal products or kitchen leftovers)<br>• Plant material from the orchard, crop residues, seedless weeds, etc.<br>• 1 kg Compost Worms<br>• Damp foliage |
| **Implementation** | **The Compost Worm**<br>An explanation of the Compost Worm is given.<br>The Compost Worm requires good humidity, a cool, dark environment, protected from rodents, which are its main predator.<br>They feed on organic waste (do not add citrus fruits, animal products or kitchen leftovers); the more waste is chopped up, the easier it is for the worm to process.<br>Approximately 1 kg of waste should be fed every week, but one should always check if there is too much left to eat or if, on the contrary, there is no more food at the end of the week.<br><br>It explains how vermicomposting works and why it is an alternative way of using organic waste.<br>The vermicomposting system is built and put into operation.<br><br>**Handcrafted construction of the vermicomposting system:**<br><br>1. In the lower basin, the stopcock is installed as low as possible so that leachate can be extracted from the basin containing waste and earthworms.<br>2. In the other tank, which must have a lid, holes are drilled all around the base so that the leachate can drain away.<br><br>How does it work?<br><br>1. The bucket with the holes is placed on top of the other bucket and the gauze is placed at the bottom |

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| | so that the worms cannot escape through the holes.<br>2. About 10 cm of moist mulch or leaf litter is placed on top of the gauze.<br>3. 1 kg of Californian red earthworm is inserted.<br>4. It is fed with 1 kg of litter and covered with some leaf litter.<br>5. The lid must not be airtight, as there must be an exchange of oxygen. To improve ventilation, small holes can be made in the lid with a hot awl.<br>6. They are fed weekly until the bowl is full.<br>7. When it is full, place another hollowed-out ball on top and continue feeding it: the worms will move in search of food, leaving the bottom ball behind.<br>8. After about a month, the first filled bucket can be taken out and the worm compost is ready for use.<br>9. Leave in a cool, shady place<br><br>How is compost used?<br><br>**Leachate**: when the process starts, a leachate is generated that can be extracted every 5-10 days and used in various ways:<br><br>1. Apply as a liquid fertiliser in irrigation water 100 ml per 1 litre of water. Can be used for ornamental plants, garden, vegetables, fruit trees. In soil and in pots. Can also be sprayed.<br><br>**Vermicompost:**<br><br>It can be applied directly to the soil as a fertiliser, at sowing time or to fertilise the crop.<br>It is also excellent for preparing the substrate of the seed bed (in this case, solarisation is very important). |
| **Evaluation** | Evaluate the fertiliser:<br><br>You can make an experiment by applying fertiliser to some plants and not to others. For example, if you have 15 chilli plants, or any other plants of the same variety and age and under the same conditions, apply fermented residues to 5 |

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| | of them, apply your organic or commercial fertiliser to another 5 and apply nothing to the other 5, mark and observe the plants every 3-4 days and make a photographic record of their growth, leaf colour, fruit development and production.<br>This monitoring, done well and hopefully with several repetitions, can indicate its quality and effect as a fertiliser.<br>The same process can be carried out if the plants are kept in pots, some with leachate in the water and some without, and are observed, recorded and monitored. |
| **Tips** | • Prepare and organise all materials for the activity.<br>• Conduct the activity in the shade or in a place with a roof to protect you in case of rain.<br>• Monitor the process and experiment with different ways of applying the product and evaluate the results.<br>• Watch the process closely if the worms try to get out of the container because they do not feel well, it could be due to lack of moisture, heat, excess waste, among others.<br>• Review manuals and videos and additional documentation to reinforce knowledge and see the process. |

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