

2) Waste-to-Food Toolkit

****Title: Waste-to-Food Toolkit – From Kitchen Scraps to Healthy Soil****

****1. What Does “Waste-to-Food” Mean?****

“Waste-to-food” means turning organic waste into something that feeds the soil and, later, our plants and food again.

Instead of sending organic waste to landfills, we:

- Collect it separately
- Compost it
- Use the compost to grow new plants

In this way, waste becomes part of a circular system, not a dead end.

****2. Types of Organic Waste Suitable for Compost****

“Green” materials (rich in nitrogen):

- Fruit and vegetable peels and scraps
- Coffee grounds and tea leaves (without plastic tea bags)
- Fresh grass clippings
- Green plant trimmings

“Brown” materials (rich in carbon):

- Dry leaves
- Straw or hay
- Shredded cardboard and plain paper (no plastic coating, little or no ink)
- Small dry twigs and wood chips

A good compost needs a mix of both greens and browns.

****3. What Should Not Go into Compost****

To keep the compost safe, clean and without bad smells, do not add:

- Meat, bones, fish
- Dairy products (cheese, milk, yoghurt)
- Cooking oil and greasy food
- Pet faeces (dogs, cats)
- Large amounts of citrus peels or very salty food
- Plastics, metals, glass, or any synthetic materials

These materials can attract pests, cause odours, or introduce harmful substances.

****4. A Simple School Model for Waste-to-Food****

Step 1 – Collection in the classroom or school kitchen

- Place a clearly labelled container: “Organic Waste for Compost”.
- Teach students and staff what can and cannot go inside.
- Encourage students to check their waste before throwing it away.

Step 2 – Daily transfer to the compost system

- Once a day, a small student team empties the container into the compost bin or pile.
- They add a layer of brown material (dry leaves, shredded cardboard) on top.

Step 3 – Moisture and mixing

- Once a week, check if the compost is too dry or too wet.
- Add rainwater if it is dry, or more brown material if it is too wet.
- Gently mix or turn the compost to add oxygen.

Step 4 – Using the finished compost

- After several months, the lower layers become dark, crumbly and smell like forest soil.
- This finished compost can be used in:
 - School gardens
 - Flower beds
 - Pots with classroom plants

****5. Scientific Basis of Waste-to-Food****

In the compost, microorganisms break down organic molecules:

- Carbohydrates → simpler sugars → CO₂ + humus

- Proteins → amino acids → ammonium → nitrates (plant-available nitrogen)
- Fats → fatty acids → CO₂ + water

Nutrients like nitrogen (N), phosphorus (P), and potassium (K) are released in forms that plants can absorb through their roots.

Instead of losing these nutrients in landfills, we recycle them back into the soil.

****6. Student Activities and Experiments****

Activity 1 – Measuring waste reduction

- Weigh the organic waste collected in one week.
- After several months, weigh the finished compost from the same system.
- Compare the masses and discuss where the “missing” mass went (CO₂, water vapour, etc.).

Activity 2 – Growth comparison

- Plant seeds in two pots:
 - Pot A: normal soil
 - Pot B: soil mixed with compost
- Keep water and light conditions the same.
- Measure plant height and leaf number over several weeks.

Activity 3 – Waste diary

- Students keep a diary of what organic waste they produce at home and at school.
- They estimate how much of it could be composted.
- They reflect on how their habits could change to reduce waste.

****7. Connection to Sustainability Goals****

Waste-to-food supports several sustainability goals:

- Less landfill waste: organic material is diverted from the general bin.
- Lower greenhouse gas emissions: less methane from landfills.
- Healthier soils: more organic matter and better structure.
- Education for responsible citizenship: students learn that their daily choices matter.

In the “[Nature’s Double Cycle](#)” project, this toolkit helps schools turn everyday waste into a learning resource and a practical contribution to the environment.