



Active learning for a better world ...with Paddy Madden

“Education for Sustainable Development gives learners of all ages the knowledge, skills, values and agency to address interconnected global challenges including climate change, loss of biodiversity, unsustainable use of resources, and inequality” – UNESCO.



Education for sustainable development (ESD)

In this school year, I hope to empower teachers and pupils to take action to limit the effects of climate change and increase the biodiversity in their schools. For September and October, the focus will be on recycling natural materials from the school grounds to create rich compost. Two methods for accomplishing this will be explored in detail: the New Zealand bin method and the hotbin method.



New Zealand bin

New Zealand bin method

What is compost?

It is a natural process of decomposition in which organic materials such as grass clippings, weeds and leaves are changed into a rich, crumbly, dark, sweet-smelling material by a myriad of soil organisms such as algae, protozoa, bacteria, fungi, worms, invertebrates and heat.

Why are some schools reluctant to compost on site?

- Fear of vermin such as rats invading

the compost bin;

- It has been trialled already and the results were unsuccessful (foul smell or flies);
- Difficulty of extracting compost from plastic composting bins.

None of these will be problems if the composting process is carried out as suggested in this article.

What are the benefits of composting?

- The process absorbs carbon, reducing greenhouse gasses.
- It increases soil biodiversity which contributes to healthy soil. The greater the number of microorganisms and other living creatures in the soil the greater the amounts of nutrients that will be gradually added to it. (On the other hand, degraded soil that has no organic matter which is constantly inoculated with artificial fertilisers, pesticides and fungicides is one of the biggest emitters of carbon).
- It adds organic matter to the soil which helps the soil to absorb and retain moisture and nutrients.
- It reduces the need to buy compost which is packaged in plastic bags.
- Composting increases well-being by reducing stress and strengthening the immune system.

What goes into the composting bin?

An equal mix by volume of green and brown material.



Mix of browns and greens for New Zealand bin

What are green and brown materials?

| Green materials | Brown materials |
|---|---|
| Grass clippings*, weeds without seeds, tea leaves, coffee grounds, faded flowers, herbs *Use grass clippings sparingly. Generally, they should be left on mown areas as a natural fertiliser | Autumn leaves, crumpled newspaper, shredded paper and cardboard, uncoated paper plates and cups, straw, shredded twigs, woody material such as bark, dry plants |

What should not go into the bin?

Kitchen waste such as cooked and uncooked vegetables and fruit, eggshells, meat, dairy products, textiles, fat, diseased plants, animal faeces, roots of dandelions, docks, scutch grass, glossy paper, coal or turf ash. Small amounts of wood ash are fine. (Place roots of perennial weeds in a plastic bag with some grass cuttings for a couple of months to destroy their vitality, then add to the bin).

How does the process work?

The New Zealand bin type system consists of three or more covered bays



Brown layer

Green layer

with slatted fronts and sides to allow air in and to ease the transfer of contents. It should be situated in the most sheltered, sunniest part of the garden on turf or soil.

1. Start with a 5cm to 10cm layer of brown material. Add a similar layer of green material. (If grass cuttings are used, mix with browns as they can compress and exclude air from the aerobic bacteria), continue until bay is full.
2. Transfer the contents of bay one to bay two, then begin filling bay one again.
3. When bay one is full for the second time, transfer the contents of bay two to bay three and begin filling bay one for the third time. After about six-12 months (depending on the season) the contents of bay three should be brown, crumbly and sweet-smelling and ready for use in the garden.



It's a good idea to keep brown materials, such as autumn leaves, shredded cardboard and paper in hessian bags beside the bin so that they're readily available.



Alternatively, add an extra bay for brown materials beside the bin. Bins can be purchased online or constructed from pallets. See bit.ly/compostingbins

Above: Brown waste near bin and Pallet bin



Did you know?

The worms found in a compost bin are not earthworms. They are **brandling worms** or tiger worms which are smaller than earthworms. They are banded

with red and brown or pink and yellow stripes.



Hotbin

The hotbin method

A hotbin is about the size of a typical waste bin. It is made from an insulating material called expanded polypropylene. This material causes the contents to heat rapidly to between

40 to 60°C, thus increasing the volume of heat-loving bacteria breaking down the contents. It is ideal for using green waste from school, such as fruit cores and peelings, eggshells, decaying fruit, unused vegetables, tea leaves and coffee grounds. (Some citrus fruit skins can be added but allow to get mouldy before adding to bin). It produces a rich compost about 30 times faster than a conventional composter. To maximise its effectiveness, about 50% of the material added should be brown, such as shredded paper and cardboard or autumn leaves. Bulk material, such as wood chips, is added to aerate the bin. The bin has a tap at the bottom for releasing leachate.



Compost from hotbin and bottled leachate

ingredients. Why are fruit peelings, eggshells, cores and vegetable waste used in this bin and not in the New Zealand bin? If these ingredients were used in a New Zealand bin they could attract unwanted vermin. The hotbin should not attract vermin because it is completely sealed.

How can the leachate be used? It can be drained regularly and bottled to make an excellent liquid fertiliser. It is best to mix this with water in a ratio of 1:10 liquid to water.

Organising the filling of the bins

New Zealand bin

When children weed the garden a layer of about 5cm to 10cm thick should be placed in bay one. A similar-sized layer of brown material, such as autumn leaves, shredded cardboard or crumpled newspaper, should be laid on top of the green layer. Small amounts of grass cuttings should be mixed with the other ingredients.

Hotbin

Vegetable and fruit waste from the classrooms and staff room should be collected in a caddy daily. (Some cut grass could be added too). This material should then be deposited in the bin after collection at least every couple of days along with an equal mix of dry brown material such as shredded cardboard, autumn leaves or crumpled newspaper. About a 5th of the brown material should ideally be bark mulch but if this is not available don't worry. It is a good idea to have the brown material available at hand to mix with the greens. A mixing rod is supplied with the bin to mix the browns and greens. See: bit.ly/hotbincomposting

Fócloir

- Sustainability: inbhuanaitheacht
- Compost: múirín
- Biodiversity: bithéagsúlacht
- Climate change: athrú aeráide
- Earthworm: péist talún
- Microorganism: miocorgánach

Common questions on composting bins

Where should it be positioned in a typical school? It should be positioned in the sunniest part of the school grounds to ensure that it heats up quickly.

How is it used? Each day the waste fruit and vegetables are collected and deposited in the bin with the other



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